ABSTRACTS

Basic and Translational Medicine
Basic research of cardiovascular disease

GW23-e0783  PROTECTIVE EFFECTS OF GLUCAGON-LIKE PEPTIDE-1 VIA CAMP/PKA/RHO DEPENDENT PATHWAY ON CARDIAC MICROVESSELS INJURY IN DIABETES MELLITUS
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Objectives Glucagon-like peptide-1 (GLP-1) was a hormone predominately synthesised and secreted by intestinal L-cells. Pharmacological modulation of the GLP-1 had emerged as an important treatment target for diabetes mellitus. In addition to its glucose lowering properties, GLP-1 was found to have multiple cardioprotective effects. Impaired cardiac microvascular function is thought to contribute greatly to the diabetes cardiovascular disease. Yet the effects of GLP-1 on cardiac microvessels remained unclear, this study was aim to investigate the protective effects of GLP-1 on cardiac microvessels injury and the underlying regulatory mechanism in diabetes mellitus.

Methods Streptozocin (STZ)-induced diabetic rats (n=45) were randomised to 12 weeks of treatment with vehicle, LAF237 (DPP-IV inhibitor, 1 mg/kg/d) or Exenatide (GLP-1 analogue, 1 nmol/kg/d). Before and after treatment, blood glucose levels and weight were assessed. Cardiac function was examined by echocardiographic measurements; cardiac energetics was examined by 13F-FDG PET/CT. Scanning electron microscopy was used to analyse changes in morphology of cardiac microvessels. Transmission electron microscopy was used to assay cardiac microvascular permeability via lanthanum nitrate tracer. Adult rat cardiac microvascular endothelial cells (CMECs) were isolated and cultured in medium alone (control) or medium containing glucose (25 mmol/l). Cardiac microvascular barrier function was assessed using transmission electron microscopy was used to assay cardiac microvascular permeability via lanthanum nitrate tracer. Adult rat cardiac microvascular endothelial cells (CMECs) were isolated and cultured in medium alone (control) or medium containing glucose (25 mmol/l), GLP-1 (10^{-7} mmol/l), high glucose (25 mmol/l) plus GLP-1 (10^{-7} mmol/l). First, GLP-1 receptor (GLP-1R) was detected by immunofluorescence and western blot. Then lucigenin-enhanced chemiluminescence assay and dihydroethidine (DHE) staining were used to assess oxidative stress. Tunnel staining and caspase-3 expression were used to assess apoptosis of CMECs. H89 was used to inhibit cAMP/PKA pathway; fasudil was used to inhibit Rho/Rho-kinase (ROCK) pathway; Rho siRNA was transfection into CMECs to silence Rho. The protein expression of Rho, ROCK, p22phox, p47phox and rac-1 was examined by western blot analysis.

Results After 12 weeks of treatment with LAF237 or Exetinade, the cardiac function and energetics were improved significantly compared with the vehicle treated groups. Cardiac microvascular barrier function was also improved. Western blot analysis showed that the CAMP/PKA activity was increased and the Rho expression was decreased in high glucose induced CMECs after treatment with GLP-1, which reproduced the same effect as Rho inhibitor H89. Fasudil and transfection with Rho siRNA significantly decreased p22phox, p47phox and rac-1 expression in high-glucose induced CMECs.

Conclusions GLP-1 could protect the cardiac microvessels against oxidative stress injury, apoptosis and the resultant microvascular barrier dysfunction in diabetic rats, which contribute to the improvement of cardiac function and energetics. The protective effects of GLP-1 are dependent on downstream inhibition of Rho, which is through cAMP/PKA pathway, resulting in decreased expression of NADPH oxidase.

GW23-e2317  INTRA-MYOCARDIAL DELIVERY OF INDUCED PLURIPOTENT STEM CELLS ENHANCES CARDIAC REPAIRS AND AMELIORATES LEFT VENTRICULAR DYSFUNCTION FOLLOWING MYOCARDIAL INFARCTION IN RATS
do:10.1136/heartjnl-2012-302920a.2

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Objectives Aging and aging-related disorders of mesenchymal stem cells transplantation impair the efficiency and function of differentiation toward cardiomyocytes after myocardial infarction. Induced pluripotent stem cells (iPSCs) may provide an alternative source of functional MSCs for cardiomyocytes repair after MI. This study aimed to evaluate the effect of intra-myocardial iPSC-MSCs transplantation on myocardial function and investigate their biological function for the treatment of acute myocardial infarction.

Methods An MI model in rat was created by ligation of left main coronary artery. Female Sprague-Dawley rats were randomised into three groups: AMI (group control), MSCs transplantation (group M), iPSC-MSCs transplantation (group iM). MSCs and iPSC-MSCs were injected into LV free wall in the region bordering an infarct in recipient rats following AMI. 3 and 7 days after MI, the EGFP donor cells were traced in MSCs recipient rats by fluorescence microscopy. The inflammatory cytokines mRNA expression were determined by means of RT-PCR. TUNEL and H&E staining were used to assess apoptosis and pathological changes, respectively. LV function was detected using echocardiography.

Results The benefits of iPSC-MSCs on acute myocardial infarction were superior to those of adult bone marrow MSCs. iPSC-MSCs therapy attenuated MI-induced inflammatory factors, apoptosis and decreased pathological damage compared with BM-MSCs, especially at 7 day. MI-dilated LV with impaired function significantly reduced fractional shortening, cardiomyocytes peak shortening and relengthening. All of these parameters were improved by iPSC-MSCs therapy which were superior to BM-MSCs and control group at both of 3 and 7 days.

Conclusions Intra-myocardial delivery of induced pluripotent stem cells could selectively migrate to peri-infarct area, attenuated MI-induced apoptosis and restored LV function. Taken together, transplantation of iPSC-MSCs represent a new treatment strategy to improve cardiac function after MI superior to bone marrow MSCs with higher security and efficiency.
THE EFFECT OF OXIDISED LOW-DENSITY LIPOPROTEIN ON NOTCH EXPRESSION IN THP1 MACROPHAGES

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Objectives To explore the expression of Notch signal and cytokines by oxidised low-density lipoprotein (ox-LDL) in macrophages of human acute monocytic leukemia cell line (THP1) and to search for possible mechanism of atherosclerosis (AS)

Methods Human macrophage from THP1 transform by phorbol 12-myristate 13-acetate (PMA) was cultured with final concentration of 50 mg/l ox-LDL for 6 h. Four receptors and five ligands of Notch signalling pathway were inspected. Dynamic changes in terms of cell shape were observed by phase contrast microscopy. Notch1, DIL4 and Jagged1 were given to 25 mg/l, 50 mg/l, 100 mg/l of three different concentrations of ox-LDL stimulation for 48 h. The best concentration was 50 mg/l. Real time-PCR (RT-PCR) detection of Notch1, DIL4 and Jagged1 mRNA expression levels of different time points after macrophages co-cultured with 50 mg/l ox-LDL for 0 h, 3 h, 6 h, 12 h, 24 h, 48 h. Notch1, DIL4 and Jagged1 protein expressions were determined by western-blot of different concentrations and different time points. Vascular cell adhesive molecule-1 (VCAM-1) and monocyte chemoattractant protein-1 (MCP-1) expression were determined by enzyme-linked immunosorbert assay (ELISA). Lipofectamine 2000 transfected Toll-like receptor 2 small interfering RNA (TLR2siRNA) which reduced 50 mg/l ox-LDL for 6 h. Four receptors and five ligands of TLR2 signalling pathway were inspected. The Notch1, DIL4 and Jagged1 expression with RT-PCR, western-blot and ELISA increased significantly suppressed in the transfection of siRNA group which THP1 derived macrophages transfected by application of Lipofectamine 2000, the expression of inflammatory factor VCAM-1 and MCP-1 was elevated significantly suppressed.

Conclusions Our data showed that with ox-LDL challenge the expressions of Notch1, DIL4, Jagged1 and the levels of VCAM-1, MCP-1 significantly increased in macrophages in a dose-time-dependent manner within some extent compared with that in the control group. Notch signal and TLR2 pathways had synergistic expression effect. Notch signalling was activated by ox-LDL stimulation and may partially mediate atherogenic effect macrophage functions.

UP-REGULATING HO-1 IMPROVES POST-INFARCTION HEART FUNCTION OF SPONTANEOUS HYPERTENSIVE RATS VIA ANTI-INFLAMMATION, ANTI-OXIDATION, LOWERING BLOOD GLUCOSE AND IMPROVING ENDOTHELIAL FUNCTION

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Objectives Our previous results showed that heme oxygenase 1 (HO-1) is involved in the regulation of endothelial function by the modulation of NOS isoforms and control of oxidative stress. HO-1, in particular, may be well suited as a therapeutic agent for myocardial protection, because the catabolic by-products of heme metabolism, carbon monoxide (CO) and bilirubin, have been reported to exert pleiotropic cytoprotective effects, including inhibition of oxidative stress, inflammation, and apoptosis.

Methods Male spontaneous hypertensive rats (SHR) at 13 weeks (n=40) and age-matched male Wistar rats (n=20) were selected. After basal echocardiography and blood pressure measurement, they were divided into six groups: (1) WT (sham+NS), (2) WT (sham+Copp), (3) SHR (MI+NS), (4) SHR (MI+Copp), (5) SHR (MI+Copp+SnMP), (6) SHR (sham+NS), n=10/group. Sham operation or coronary ligation were performed respectively. The first day after operation, medications were administered among groups: normal saline (NS), or cobalt protoporphyrin (CoPP), an inducer of HO-1, 4.5 mg/kg, or concurrently with tin mesoporphyrin IX dichloride (SnMP), an inhibitor of HO activity, 15 mg/kg, all for 6 weeks, 1/week, intraperitoneally. At 6 weeks, trans-thoracic echocardiography and hemodynamics tests was performed; thereafter, blood was collected for blood biochemistry, NO, PGI2 testing. One part of isolated hearts were fixed in 10% formalin, paraffin embedded, processed for HE and Masson trichrome stain. The other part of the hearts were rapidly frozen in liquid nitrogen, stored at −80°C, prepared for western blot analysis of HO-1 expression.

Results

(1) Blood pressure: Compared with WTs, SHR exhibited significantly higher blood pressure, including systolic blood pressure (SBP) (212.37±31.09 vs 138.08±13.03, p=0.000), diastolic blood pressure (DBP) (146.54±23.87 vs 115.75±12.50, p=0.000), and mean arterial pressure (MAP) (205.00±40.23 vs 123.22±17.03, p=0.000). Copp treatment significantly lowered SBP, DBP, MAP in SHR (MI+Copp) compared to SHR (MI+NS) (SBP: 154.75±10.53, p=0.000; DBP: 136.90±12.39, p=0.000; MAP: 142.61±11.62, p=0.000).

(2) Cardiac function: Left ventricular ejection fraction (LVEF) and left ventricular fractional shortening (LVFS) between WTs and SHRs before operation are similar. After coronary ligation operation on SHRs, LVEF and LVFS were significantly decreased in SHR.
Dynamic Alterations of Connexin 43, Matrix Metalloproteinase-2 and Tissue Inhibitor of Matrix Metalloproteinase-2 During Ventricular Fibrillation in Dogs

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**Objectives** We aimed to investigate the dynamic alterations of cardiac connexin 43 (Cx 43), matrix metalloproteinase-2 (MMP-2) and tissue inhibitor of metalloproteinase-2 (TIMP-2) in the setting of different ventricular fibrillation (VF) duration and try to reveal the possible initiation and/or persistence mechanisms of VF.

**Methods** VF was electrically induced in 32 dogs. The animals were randomly divided into four groups (sham control group: n=8; 8-min VF group: n=8; 12-min VF group: n=8; 30-min VF group: n=8). Echocardiography measurement and hemodynamic variables were recorded before VF Cx 43 and phosphorylated Cx 43 (p-Cx43) were analysed by western blot and immunofluorescence. MMP-2 and TIMP-2 were analysed by western blot and immunohistochemistry.

**Results** There were no statistically significant differences among the animals in body weight, heart rate, LAD, LVDd, LVEF and hemodynamic variables at baseline. Compared with the sham control group, Cx 43 in other three VF groups were significantly decreased, and the amount of Cx 43 declined with the duration of VF (0.83±0.04 vs 0.71±0.06 vs 0.66±0.05 vs 0.52±0.07, p<0.05). p-Cx 43 in 12-min and 30-min VF group were significantly reduced (0.76±0.07 vs 0.64±0.07 vs 0.69±0.05, p<0.05), while there was no statistical distinction between the sham control group and 8-min VF group (0.67±0.06 vs 0.69±0.05, p>0.05), in addition, the same change tendency was observed in the ratio of p-Cx43/Cx43 (0.64±0.04 vs 0.71±0.06 vs 0.66±0.05 vs 0.52±0.07, p<0.05). There were no statistically significant differences among the contents of MMP-2, and the level of TIMP-2 declined by degrees with the duration of VF (0.51±0.02 vs 0.53±0.03 vs 0.54±0.04, p>0.05), however, the MMP-2 increased in other two longer-duration VF groups (0.9±0.07 vs 0.71±0.05, p<0.05). The ratios of MMP-2/TIMP-2 were higher in VF groups, and rose up gradually with the duration of VF (0.51±0.02 vs 0.54±0.03 vs 0.56±0.04 vs 0.51±0.06, p<0.05). No significant difference was observed between the sham control group and 8-min VF group concerning levels of MMP-2 (0.51±0.03 vs 0.54±0.04, p>0.05), however, the MMP-2 increased in other two longer-duration VF groups (0.9±0.07 vs 0.71±0.05, p<0.05). A remarkable correlation was also observed between the ratio of p-Cx43/Cx43 and TIMP-2/TIMP-2 (r=−0.93, p<0.01).

**Conclusions** Dynamic alterations in total amount, distribution and phosphorylation status of Cx 43 were observed within the 30 min duration of VF. Meanwhile, the present findings also demonstrated that the expression of TIMP-2 declined and MMP-2 increased with the duration of VF. A remarkable correlation was also observed between the ratio of p-Cx43/Cx43 and the ratio MMP-2/TIMP-2. These data are consistent with previously published data by our laboratory. In conclusion, the alteration of Cx 43 and/or p-Cx 43, the imbalance between MMP-2 and TIMP-2 may contribute to the initiation and/or persistence of VF Therefore, maneuvers managed to modify Cx 43 or normalise the balance of MMP-2/TIMP-2 may be used to ameliorate prognosis of VF.
channels were dysfunction in hearts of ST3Gal-IV knockout mice, which resulted in calcium overload, enhanced the amplitude of action potential, increased protein expression of calcineurin-A (CnA), and translocated nuclear factor of activated T cells (NFATc3) into nucleus, so as to activate the hypertrophic genes expression, and led to heart failure.

Conclusions With the deficiency of ST3Gal-IV gene, heart failure was more susceptible to forming through calcium-calcium signalling pathway. Therefore, ST3Gal-IV gene plays a vital role in cardiac ion channel function, which keeps normal cardiac systolic function.

**ABSTRACTS**

**GW23-e1139** EXPERIMENTAL RESEARCH ABOUT EFFECT OF CELL–CELL CONTACT TO MESENCHYMAL STEM CELLS DIFFERENTIATE INTO VASCULAR ENDOTHELIAL CELLS

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Objectives Use the method of HUVECs were cultured with human mesenchymal stem cells by cell–cell contact to simulate intravascular environment after angioplasty and stent implantation, and research the role of cell–cell contact to induce MSCs differentiate into endothelial cells. The research provides the experimental basis for MSCs repair the damage to vascular endothelium and prevention of vascular restenosis after intervention.

Methods

1. We mixed HUVECs and MSCs by the same density (5×10^5/ml) and volumes to construct the model of cell–cell direct contact. Used Millicell Culture Plate Inserts of 0.4 μm pore size to construct the model of cell–cell indirect contact, MSCs grew on its lower chamber and HUVECs grew on its lower chamber with the same density (5×10^5/ml) and volumes.

2. The VEGF levels of experimental group (culture media of co-cultured for 48 h) and control group (MSCs and HUVECs’s mixed culture media after them were cultured alone for 48 h) were confirmed using ELISA assays. Co-cultured for 5 days. The MSCs’s expression of fetal liver kinase-1 (Flk-1), von Willebrand factor (vWF) and the ingestible ability of Dil labelled acetylated low-density lipoprotein (Dil-ac-LDL) were analysed by immunofluorescence staining, at the same time the changes of ultrastructure of cell–cell contact co-cultured cells were observed by transmission electron microscopy.

Results

1. MSC were negative expressed Flk-1 and vWF protein; HUVECs typically expressed the endothelial characteristics of vWF. The cells of cell–cell direct contact were observed under inverted phase contrast microscope and showed two kinds of cells gradually fused, the cells gradually close and difficult to distinguish.

2. The VEGF content of Experimental groups (559.55±66.19) pg/ml and control groups (373.98±57.28) pg/ml (p<0.05, n=3). Identified by immunofluorescence techniques, in direct contact co-culture system, by excited of different light from the laser scanning confocal microscope, fluorescence of MSCs nuclear labelled DAPI showed blue fluorescence, some MSCs of blue nuclear expressed Flk-1 protein and showed red fluorescence, then part of the Flk-1 positive MSCs expressed vWF protein and showed green fluorescence; besides, some MSCs could phagocytose Dil-ac-LDL. However, in indirect contact co-culture system, MSCs were negative expressed Flk-1 and vWF protein.

Observe ultrastructure of cell–cell contact co-cultured cells under transmission electron microscopy, we found karyoplasmic ratio of undifferentiated MSCs was big (karyoplasmic ratio>1.5); the nuclear forms was irregular, had notch and had 2–3 nucleoli inside nucleus; scarce and less developed organelles in cytoplasm. However, proportion of Mature HUVECs nucleoplasm was small (karyoplasmic ratio<0.5), HUVECs had regular nuclear shape, prominent nucleoli, abundant cytoplasmic organelles. MSCs during differentiation was observed the reduced karyoplasmic ratio and relatively abundant organelles, and electronic gap junctions between HUVECs and MSCs’s the local of membrane; besides, cell fusion be seen.

Conclusions

1. MSCs can differentiate into endothelial cells through cell–cell contact by direct co-culture with HUVECs and have phagocytic ability of Dil-ac-LDL.

2. The mechanism that the cell–cell contact co-culture system can induce MSCs differentiation into endothelial cells may associated with the following factors:

   (1) Cell–cell direct contact promote cell autocrine and paracrine VEGF increase significantly, involving in promoting the differentiation of MSCs.

   (2) Exist of cell fusion takes part in this process.

   (3). The form gap junction of intercellular communication between HUVECs and MSCs’s the local of membrane.

**GW23-e1571** OVEREXPRESSION OF CONNEXIN 45 IMPROVES THE FUNCTION OF BIOLOGICAL PACEMAKERS DERIVED FROM RAT MESENCHYMAL STEM CELLS TRANSFECTED WITH HCN4

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Objectives The majority of studies have primarily focused on electrical impulse generation in the development of pacemaker cells, but have not adequately addressed the issue of electrical propagation, especially how to improve pacemaker function. Distinct gap junction (GJ) channels consisting of connexin 45 (CX45) in sinoatrial node (SAN) and transition zones contribute to the unidirectional propagation of electrical signals from the SAN to the atria. With this in mind, we embarked on a project to test proof-of-principle if genetically engineered mesenchymal stem cells (MSCs) transfected with hyperpolarisation-activated cyclic nucleotide-gated channel 4 (HCN4) and CX45 to mimic the phenotype of native SAN cells to improve the pacemaker function.

Methods MSCs of rat were transduced with a cardiac pacemaker gene-HCN4 to generate a biological pacemaker, via transfection with a lentiviral vector. Funny current (If ) in HCN4+ MSCs was recorded by voltage-clamp. Overexpression of connexin 45 (gene Gaj7) in MSCs was achieved by transfection with the plasmid pDsRED2-N1-Ga7-RFP. Double-immunolabelling with anti-connexin 43 and anti-connexin 45 antibodies were used to identify the gap junction channels. The effects of the genetically modified MSCs on cardiomyocyte excitability were determined in MSCs cocultured with neonatal rat ventricular myocytes. Spontaneous action potentials of neonatal rat ventricular myocytes were recorded by current-clamp.

Results

High level time- and voltage-dependent inward hyperpolarisation current that was sensitive to 4 mmol/l Cs + was detected in HCN4+ MSCs, confirming that HCN4 acted as If channels in MSCs. Connexin 43 and connexin 45 were simultaneously detected in CX45+ MSCs. Beating frequency was (82±8) beats per minute (n=5) in myocytes cocultured with non-transfected control MSCs, versus (129±11) beats per minute (n=5) in myocytes cocultured with HCN4+ MSCs. Myocytes cocultured with MSCs
cotransfected with HCN4 and connexin 45 had the highest beating frequency at (147±9) beats per minute (n=5).

Conclusions These findings demonstrate that overexpression of connexin 45 and subsequent formation of heteromeric connexin 45/connexin 45 gap junction channels in HCN4 expressing MSCs can improve their function as cardiac biological pacemakers in vitro.

GW23-e2220 THE SERA FROM COLLAGEN-INDUCED ARTHRITIS MICE ACCELERATE MACROPHAGE-DERIVED FOAM CELLS FORMATION
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Objectives Rheumatoid arthritis (RA) is associated with excess of cardiovascular mortality and atherogenesis is accelerated in RA patients, but the exact mechanism remains unclear. Current findings suggest that the initiation and development of both RA and atherosclerosis (AS) can be induced by common circulating inflammatory cytokines and proinflammatory process. The chronic systemic inflammation in RA is considered as an independent risk factor for the aggravation of AS. The formation of foam cells in the arterial intimal layer is the characteristic of atherosclerotic lesions. However, little is known about the effect of systemic inflammatory state and circulating inflammatory mediators of RA on foam cells transformation of macrophages. We explored the effect of RA on macrophage-derived foam cells formation, and possible mechanisms.

Methods The sera from collagen-induced arthritis (CIA) and control mice were harvested at 8 weeks after immunisation (type II collagen or acetic acid, respectively) and blood lipid levels were measured. Murine macrophage cell line (RAW264.7 cells) were treated with 3% sera of CIA mice or control mice for 24 h in the presence or absence of NF-κB inhibitor (Bay11-7082). The mRNA and protein expressions of CD36, ABCA1 and ABCG1 were determined by Realtime-PCR and western blot. Fluorometric method was used to examine the cholesterol content in cells and cholesterol efflux to apoA-I, HDL and mice sera. Intracellular lipid was analyzed by oil red O staining. The mRNA expressions of p50, p65 and IκB-α were determined by Realtime-PCR and NF-κB binding activity was examined by electrophoretic mobility shift assay.

Results Compared to control mice sera, CIA mice sera increased CD36 mRNA and protein expressions (7.10±2.28fold and 1.58±0.04fold, p<0.05) and ABCA1 mRNA expression in RAW264.7 cells. The cholesterol efflux to CIA mice sera (2.98±1.06%) decreased significantly when compared with control sera (5.54±1.32%), which probably was related to the lower HDL level of CIA mice sera. In accord with ABCA1 and ABCG1 protein expressions, there were no significant differences in apoA-I-mediated and HDL-mediated intracellular cholesterol efflux in lipid-load RAW264.7 cells treated with CIA and control mice sera. Compared to control mice sera, intracellular lipids and cholesterol ester (CE), free cholesterol (FC) contents increased in RAW264.7 cells treated with CIA mice sera for 24 h (CE:2.07±0.0202 μg/mg protein to 2.82±0.04 μg/mg protein, FC:6.50±0.28 μg/mg protein to7.28±0.22 μg/mg protein, p<0.05), which indicated the CIA mice sera had the effect on acceleration macrophage-derived foam cells formation. Additionally, CIA mice sera up-regulated p50, p65 and IκB-α mRNA expressions and increased NF-κB binding activity. NF-κB inhibitor Bay11-7082 suppressed ABCA1 mRNA expression which was induced by CIA mice sera, but there were no significant differences in CD36 and ABCG1 mRNA expressions.

Conclusions Our results suggest that the sera from CIA mice accelerate the macrophage-derived foam cells formation. The mechanism is possibly involved in the impaired balance between influx and efflux of cholesterol in macrophages by increasing lipid uptake via CD36 up-regulation and reducing cholesterol efflux to CIA sera. NF-κB pathway activated by CIA may involve in the process.

GW23-e2105 HRAMP1 MODIFIED MSCS IMPROVE CARDIAC FUNCTION AND INHIBIT NEOINTIMAL PROLIFERATION IN THE CAROTID ANGIOPLASTY AND MYOCARDIAL INFARCTION RABBIT MODEL
doi:10.1136/heartjnl-2012-302920a.10

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Objectives Although transplanting mesenchymal stem cells (MSCs) can improve cardiac function and contribute to endothelial recovery in a damaged artery, natural MSCs may induce neointimal hyperplasia by directly or indirectly acting on vascular smooth muscle cells (VSMCs). Here, we investigated the effects of MSCs overexpressing the human receptor activity-modifying protein 1 (hRAMP1) on heart function and artery repair in rabbit models of myocardial infarction reperfusion and carotid artery injury.

Methods MSCs transfected with a recombinant adenovirus containing the hRAMP1 gene (EGFP-hRAMP1-MSCs) were injected into the rabbit models via the ear vein at 24 h after carotid artery injury and myocardial infarction.

Results Seven days post EGFP-hRAMP1-MSC transplantation, the cells that expressed both EGFP and CD31 were detected in the neointima of the damaged artery via immunofluorescence. EGFP-hRAMP1 expression was observed in the injured artery and infarcted myocardium by western blot analysis, confirming that the engineered MSCs were targeted the injured artery and infarcted myocardium and expressed hRAMP1 protein. Compared with the EGFP-MSCs group, the EGFP-hRAMP1-MSCs group had a significantly smaller infarcted area and improved cardiac function by 28 day after cell transplantation, as detected by triphenyltetrazolium chloride (TTC) staining and echocardiography. Additionally, arterial HE staining revealed that the area of the neointima and the area ratio of intima-media were significantly decreased in the EGFP-hRAMP1-MSCs group.

Conclusions Therefore, compared with natural MSCs, EGFP-hRAMP1-engineered MSCs improved infarcted heart function and endothelial recovery from artery injury more efficiently, which will provide valuable information for the development of MSCs-based therapy.

GW23-e2670 EFFECTS OF SIMVASTATIN IN A RABBIT MODEL OF ATHEROSCLEROSIS: ROLE OF HO-1/CO-CGMP PATHWAY AND RELATED ANTI-OXIDATIVE ENZYME EXPRESSION
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Objectives Clinical and experimental observations indicated that HMG-CoA reductase inhibitors (statins) have pleiotropic effects. The present study was designed to elucidate the status of cyclic adenosine monophosphate (c-GMP), Cyclooxygenase-2 (COX-2),
Carbon Monoxide Haemoglobin (COHb) and haem oxygenase-1 (HO-1) to the antioxidative effects of Simvastatin in the hypercholesterolemic rabbit.

**Methods** Twenty four male Japanese white (JW) rabbits weighing approximately 2.0 kg were used in this study. The animals were randomised into three groups of eight animals each: one control group and other two groups which were maintained on high-cholesterol diet (HCD) for 24 weeks. After 8 weeks on this diet, the animals were divided into two groups: non-treated group and simvastatin group; the animals were euthanised with an overdose of sodium pentobarbital at the end 24th week. The aorta were excised, placed in ice-cold sterile saline, and cleaned of connective tissue. Blood was taken through cardiac puncture and plasma was used for biochemical assay of lipid peroxides. Levels of HbCO, COX-2 and cGMP were measured by Enzyme-Linked Immunosorbent Assay (ELISA) kits. HO-1mRNA in arterial were analysed using Real Time Quantitative PCR methods, and expression of MMP-9 protein was measured by immunohisto-chemical assay, serum malondialdehyde (MDA), superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px) were also measured.

**Results** Twenty-four weeks of atherogenic diet significantly increased the levels of MDA cytotoxic (19.72±2.60 vs 14.24±1.87 ng/ml control group), and SOD (1.51±0.45 vs 7.92±1.16 u/ml control), cGMP (18.66±1.47 vs 12.54±1.45 nmol/l control group) decreased in serum; HO-1mRNA expression of non-treated group is no different than the control group (1.75±1.02 vs 1.34±0.65), but is showing the tendency to increase (5.22±1.67 vs 1.75±1.02 non-treated group, p=0.062) after treatment with Simvastatin. SOD, NO and cGMP were as well as increased (p<0.01 or p<0.05), but MMP-9 and HbCO (56.12±11.67 vs 101.0±41.55 u/ml non-treated group) significantly decreased in serum; the 3rd, 10th weeks, especially at the end of the 10th week; The CAT level and the T-AOC were increased significantly in the 3rd, 10th weeks, especially at the end of the 10th week; MDA and ox-LDL levels were increased in each time (p<0.05 or p<0.01). No significant main effect was found in GSH-Px between the two groups (p=0.05).

**Conclusions** CHOL group get the damage of lipid peroxidation during the modelling, the oxidative stress and anti-oxidative defense system have been imbalanced. The different antioxidant enzymes may have the different initial effective time, and resistance the damage of active oxygen to the body.

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**Objectives** To study the influence of sleep disturbances (SD) on relative risk of an arterial hypertension (AH) incidence in women aged of 25–64 years during 16 years of follow up in Novosibirsk.

**Methods** Within the WHO “MONICA-psychosocial” programme random representative sample of women aged 25–64 years who were residents of one district in Novosibirsk, were surveyed in 1994. Questionnaire ‘Awareness and attitude towards the health’ was used to estimate quality of sleep. From 1995 to 2010 women were followed for 16 years for the incidence of AH. AH was defined as 140/90 mm Hg or higher and/or reception of antihypertensive drugs. Cox proportional regression model was used for an estimation of relative risk (HR) of AH. Chi-square (χ²) was used for assessment of statistical significance between groups.

Women having AH at the baseline were not included in the analysis.

**Results** AH was developed in 33.4% women during 16 years of follow up. SD in studied cohort were revealed in 65.3% of women. HR of AH in women with SD during the first 5 years of study was more than in 4 time higher compared women with good self-estimation of sleep (HR=4.35, 95.0% CI 1.29 to 14.59, p<0.05). With regard to age categories, there was a tendency of increasing AH risk in 35–44 and 55–64 years age groups. During 10 years of study women with SD had 2.7 times higher risk of AH (HR=2.69, 95.0% CI 1.01 to 7.15; p<0.05), and there was also a tendencies of higher risk in all age categories with the exception of 25–34 years. We did not have significant risk of AH during 16 years of follow up in women with SD (HR=1.05, 95% CI 0.74 to 1.48, p>0.05) but there was the tendency of higher risk of AH in older age groups.

Our findings show AH incidence rates were significantly higher in divorced women with SD compared those who were married with good sleep (χ²=4.025 df=1 p<0.05). There was tendency of increasing AH rates in women with higher school education having SD compared those with higher (university) education (χ²=5.301 df=1 p=0.069) and uncompleted higher or college education (χ²=2.793 df=1 p=0.095) having good sleep. With regard to...
Occupational status, the rate of AH incidence was higher in middle managers ($\chi^2=4.340$ df=1 $p<0.05$), managers ($\chi^2=9.190$ df=1 $p<0.01$), moderate manual workers ($\chi^2=4.074$ df=1 $p<0.05$) and easy manual worker ($\chi^2=7.226$ df=1 $p<0.01$) having SD, compared women moderate manual work having good sleep. There was higher rate of AH in managers ($\chi^2=7.217$ df=1 $p<0.01$) and easy manual worker ($\chi^2=5.133$ df=1 $p<0.05$) with SD compared engineers having good sleep.

**Conclusions**  There is high prevalence of SD in Russian female population aged 25–64. During 16 years of follow up women with SD have significantly higher risk of AH, especially on first 5 years of study. SD associated with higher rate of AH incidence in divorced women occupied in class of managers and manual work class.

**GW23-e2533**  
**EFFECTS OF ENALAPRIL AND IRBESARTAN ON CAROTID ARTERY REMODELLING AND TGF-β1/SMADS PATHWAY IN RENOVASCULAR HYPERTENSIVE RATS**

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**Objectives**  To investigate the effects of single-drug or combination therapy of enalapril and irbesartan on carotid artery remodelling and TGF-β1/Smads signal pathway.

**Methods**  Renovascular hypertensive rats (RHR) developed by ‘two-kidney and one-clamp’ method were treated respectively with distilled water (model group, n=6), enalapril (10 mg/kg/d), n=6), irbesartan (50 mg/kg/d), n=6) and enalapril plus irbesartan (5 mg/kg+d+25 mg/kg/d, n=6) for 6 weeks. Six sham-operated rats were used as controls. Carotid artery morphology and structural changes were observed through HE staining, immunohistochemical staining and Masson staining. Media thickness (MT), lumen diameter (LD), media thickness and lumen diameter ratio (MT/LD) and collagen fibre area percentage of carotid arteries were measured. Moreover, the immunohistochemical staining was applied to detect the expression of alpha-smooth muscle actin (α-SMA), proliferating cell nuclear antigen (PCNA), TGF-β1, p-Smad2/3 and Smad7.

**Results**  In the model group, the media thickness was significantly increased, and the volume of vascular smooth muscle cell (VSMC) increased and disarranged. MT, LD, MT/LD, α-SMA, PCNA and collagen fibre area percentage of carotid arteries in the model group were higher than those in the sham-operated group (p<0.01), and TGF-β1 and p-smad2/3 were increased whereas Smad7 was decreased in the model group (p<0.01). Single enalapril or irbesartan therapy decreased MT, MT/LD and the protein expression of TGF-β1, p-smad2/3, and increased the expression of Smad7. Combined enalapril and irbesartan treatment showed significant reductions in above experimental indices than single drug interventions (all p<0.05).

**Conclusions**  The TGF/Smads signalling pathway may be involved in carotid remodelling of RHR. Enalapril or irbesartan can attenuate carotid remodelling of RHR through regulating TGF-β1/Smads pathway and both combination treatment seems to have interaction.

**GW23-e2510**  
**INTERFERENCE WITH AKT SIGNALLING IN DYSLIPIDEMIA DIMINISHES MYOCARDIAL INFARCTION AND PROMOTES SURVIVAL BY INHIBITING OXIDATIVE STRESS.**

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**Objectives**  Cardiovascular disease resulting in myocardial infarction (MI) is the leading cause of mortality in developed countries; however, the mechanisms controlling this complex disorder remain elusive. Since Akt activation was shown to be increased in human and mouse atherosclerotic lesions and failing hearts, we hypothesised that Akt signalling might contribute to several aspects of the pathogenesis of cardiovascular disease.

**Methods**  C57BL/6, ApoE−/− (C57BL/6 background), and SR-BI+/− (mixed C57BL/6xS129 background) mice were purchased from Jackson Laboratories (Bar Harbor, ME). SR-BI+/−/ApoE−/− mice were backcrossed to C57BL/6 background for 10 generations. Akt1+/− mice were generated as previously described and backcrossed to the C57BL/6 background for 10 generations. SR-BI+/−/ApoE−/− (DKO) mice were generated by intercrossing SR-BI+/−/ApoE−/− mice. SR-BI+/−/ApoE−/−/Akt1−/− (TKO) mice were generated by first crossing Akt1−/− mice with SR-BI+/−/ApoE−/− mice. Mice were sacrificed at 42 days of age for most experiments. Immunoblotting Hearts were homogenised in sample buffer. Proteins were detected with anti-Akt1, anti-phospho-Akt, anti-phospho-GSK-3β or anti-GSK-3β antibodies. Cardiac function was evaluated with a Sequoia C256 (Acuson) and M mode analysis was performed to measure ejection fraction (EF) and fraction of shortening (FS). Mice were sacrificed at 6 weeks of age when cardiac dysfunction was just becoming apparent to assess the role of Akt1 deletion in cardiac pathogenesis. Hearts were cut at the mid-level transversely, as reported previously, and embedded in paraffin. Serial sections (8 μm) were cut and stained with H&E or Masson’s trichrome to quantify fibrosis. Five images were taken of four sections per Masson’s trichrome stained heart on an Olympus BX51 microscope. Cardiac fibrosis was quantified by measuring the total stained area the total area of the heart using Image Pro.

Atherosclerotic lesions were quantified by en face aortic coverage measured by computer-assisted planimetry. Aortae were cut open longitudinally, stained with Oil red O, and digitally scanned. VCAM-1 expression was assessed in endothelial cells, as demonstrated by CD31 staining, in the aortic arch and descending thoracic aorta by en face staining, followed by laser-scanning confocal microscopy (Leica TCS-SP) as previously described.

**Results**  Akt1 deletion under dyslipidemia alleviates cardiac dysfunction (EF37.67%±6.60 in TKO vs 21.94%±3.78 in DKO, FS 39.25%±3.23 in TKO vs 16.22%±3.09 in DKO), diminishes MI size (3.78%±0.864 in TKO vs 22.02%±5.926 in DKO), and, most importantly, prolongs lifespan (44.23±7.43 days in DKO vs 51.43±6.29 days in TKO). TKO mice exhibit reduced atherosclerosis. While dyslipidemia was equal, ROS generation and consequent oxidised lipid accumulation was dramatically reduced in TKO. Simultaneously, Akt1 deletion diminished CD36 expression, the main oxidised lipid receptor responsible for foam cell formation.

**Conclusions**  Interference with Akt activation improves survival during dyslipidemia by reducing oxidative stress and oxidised lipid...
responses thus providing a protective effect. Normalisation or prevention of Akt overactivation during atherogenesis might be beneficial for the treatment of atherosclerosis and heart failure.

**GW23-e2119 POSTCONDITIONING EFFECTS OF ORAL NICORANDIL TREATMENT ON PATIENTS WITH ACUTE ANTERIOR MYOCARDIAL INFARCTION**

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**Objectives** In recent years, the development of thrombolysis and percutaneous coronary intervention (PCI) have positive impacts on outcome of the patients with acute myocardial infarction (AMI), but the reperfusion injury followed by these treatments per se would lower the benefit. After carrying on a large amount of research, people have found that ischaemic preconditioning can decrease the reperfusion injury and reduce the infarct size, which is a strong endogenous myocardial protective form of reducing reperfusion injury. But it must be operated in a transient time before myocardial ischaemia, which is the bottleneck of its wide clinical application. But recent research has found that ischaemic preconditioning can exert cardioprotective effect as well when operated after a short period of myocardial ischaemia, which has become a hotspot of coronary heart disease therapy researches.

Since the mitochondria potassium ATP (mito-KATP) channel is at the downstream of signal pathway of preconditioning and postconditioning, the activation of mito-KATP channel can directly induce preconditioning and postconditioning. Nicorandil is a medicine which can act as agonist of mito-KATP channel and has nitrates effect. The pharmacologic preconditioning caused by Nicorandil has been confirmed in animal experiments and clinical tests. By activating mito-KATP channel, Nicorandil can cause pharmacologic postconditioning, theoretically. However, at present there are only a few animal experiments validating the postconditioning effect, no further clinical experiments develops this topic. To test whether nicorandil can induce pharmacologic postconditioning or not, and to test whether it can reduce the infarct size of the acute anterior myocardial infarction, which achieve the result of limiting the injury of reperfusion.

**Methods** According to the criteria of inclusion and exclusion, the final experimental subjects are 43 patients with acute anterior myocardial infarction. All of them were treated in the emergency department of Zhongshan People’s Hospital during the period of March 2011 to January 2012. They were randomly divided into two groups. There were 21 patients in group NIC and 22 in group ISDN. Patients in NIC group were taken 10 mg Nicorandil (NIC) orally before PCI procedure and treated with 5 mg Nicorandil three times a day for 7 days. Patients in ISDN group were given Isosorbide Dinitrate (ISDN) in the same method.

By observing the changes of ECG ST-segment before operation and 1 h after operation, the ST-segment resolution rate was gained; and the blood samples were taken from all patients before operation and 6 h, 12 h, 18 h, 24 h, 48 h, 72 h after operation, which are used to observe the dynamic changes of CKMB. At last, the ECT myocardial perfusion examinations were performed in the patients on the 7th day after operation, which can reflect the infarct size of the acute anterior myocardial infarction.

**Results** Compared with the ISDN, nicorandil can considerably reduce the peak value of creatine kinase myocardial band. NIC group (171.6±105.7 U/l) vs ISDN group (246.4±108.4 U/l), p<0.05. They also can reduce the area under the curve. NIC group (4509±2575) vs ISDN group (5854±2552), p<0.05. Moreover, NIC group had a better ECG ST-segment resolution. There are 18 patients in NIC group and 13 patients in ISDN group having experienced ST-segment completely resolution. The ST-segment resolution rate of the two groups are 85.71% and 59.09%, p<0.05, respectively.

**Conclusions**

(1) Before giving reperfusion in the patients with acute anterior myocardial infarction, oral nicorandil treatment within 1 h can improve ECG ST-segment resolution, reduce the peak value of CKMB and the area under the curve of CKMB, and decrease the proportion of ECT myocardial perfusion defect extent in left ventricle and ECT perfusion defect score.

(2) By activating the mito-KATP channel, nicorandil can induce pharmacologic postconditioning effect, limit the infarct size of the acute anterior myocardial infarction and decrease the reperfusion injury, which eventually form cardioprotective effects. Besides, this effect is no related to nitrate effect.

**GW23-e1192 EFFECTS OF ATORVASTATIN ON METHYLATION AND MRNA EXPRESSION OF BCL-2 IN HYPERLIPIDAEMIA WISTAR RATS**

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**Objectives** To investigate effects of atorvastatin on methylation status of bcl-2 gene promoter and mRNA expression of bcl-2 in aortic tissue of hyperlipidaemia Wistar rats.

**Methods** 66 Wistar rats were equally randomised into three groups: control group, hyperlipidaemia group and hyperlipoidaemia rat with atorvastatin group. The rats in control group were fed a normal chaw, and the other groups were fed a chaw formula as designed for 12 weeks. From the 12th week gavage experiment, after 4 weeks of heart blood was then drawn for detection of serum cholesterol, triglyceride, low density lipoprotein-cholesterol, high density lipoprotein-cholesterol; aortic nucleoprotein was extracted for detection of DNA methyltransferase activity. The methylation specific polymerase chain reaction (MSP) method was used to detect bcl-2 gene methylation in aortic tissue of control group, hyperlipidaemia group and hyperlipoidaemia rat with atorvastatin group. The expression of bcl-2 mRNA in aortic tissue of control group and hyperlipidaemia group Wistar rats was detected by real-time quantitative polymerase chain reaction.

**Results** A high-fat diet for 12 weeks is sufficient to induce hyperlipidaemia; Atorvastatin supplementation to the rats fed the high-fat diet prevented an elevation total cholesterol (TC), triglyceride (TG), low density lipoprotein-cholesterol (LDL-C) and increase high density lipoprotein-cholesterol (HDL-C) levels in the serum (p<0.05) and morphological changes in the thoracic aorta. Compared with the control group, hyperlipidaemia group significantly increased DNA methyltransferase activity and methylation status of bcl-2 gene promoter (p<0.05), the expression of bcl-2 mRNA was decreased in hyperlipidaemia groups (p<0.05). Compared with the hyperlipidaemia group, atorvastatin group significantly decreased DNA methyltransferase activity and methylation status of bcl-2 gene promoter (p<0.05), the expression of bcl-2 mRNA was increased in hyperlipidaemia groups (p<0.05).
Conclusions Atorvastatin supplementation can blunt the rise in methylation status of bcl-2 gene promoter but also can increase the expression of bcl-2 mRNA in the aorta of rats with hyperlipidaemia. The study provides new ideas for prevention and delay of atherosclerosis.

Objectives This study was designed to determine the role of chemokine receptor 2 (CCR2), a receptor of MCP-1, in the development of salt-sensitive hypertension-induced renal damage.

Methods We induced hypertension by uninephrectomy and deoxycorticosterone (DOCA)-salt in C57BL/6 mice with or without a selective CCR2 antagonist, RS504393. Sham mice underwent uninephrectomy without receiving DOCA and saline.

Results After 4 week treatment, systolic blood pressure (SBP) measured by tail-cuff method increased in the DOCA-salt-treated mice compared with the sham mice (142±7 vs 107±6 mm Hg, p<0.01). DOCA-salt treatment also induced renal hypertension, increased urinary albumin and 8-isoprostane excretion and decreased creatinine clearance compared with the sham mice (110±9.5±0.0 vs 75.6±1.9 mg/10 g body weight; 25±5.2 vs 5.7±0.4 μg/24 h; 1.6±1.9±0.5 ng/24 h; 211±13 vs 336±17 ml/24 h, p<0.05). Periodic acid-Schiff staining showed that DOCA-salt treatment caused obvious glomerulosclerosis compared with the sham mice (43±4 vs 13±2 cells/mm², p<0.05). Masson trichrome staining revealed that tubulointerstitial injury in kidney also increased in the DOCA-salt-treated mice compared with the sham mice (2.29±0.36 vs 43±4.0±2.0, p<0.05). Immunostaining studies showed that DOCA-salt treatment increased monocyte/macrophage infiltration in kidney compared with the sham mice (43±4±13±2 cells/mm²; p<0.05). Blockade of the CCR2 with RS504393 (4 mg/kg/day, sc) had no effect on SBP. However, they prevented renal morphological damage and inhibited the increase in urinary albumin and 8-isoprostane excretion and the decrease in creatinine clearance (p<0.05).

Conclusions Our data showed that blockade of CCR2 with RS504393 prevented renal damage induced by DOCA-salt hypertension independently of their effects on blood pressure. The results suggest that CCR2-mediated monocyte/macrophage infiltration may contribute to renal damage induced by salt-sensitive hypertension.

Objectives INTRODUCTION: Angiotensin (Ang) II is known to activate matrix metalloproteinases (MMPs), leading to degradation of extracellular matrix (ECM) proteins and myocardial remodelling. Angiotensin-converting enzyme-2 (ACE2) is a carboxypeptidase that metabolises Ang II to yield Ang-(1–7), essentially negatively regulating the renin-angiotensin system. We hypothesised that loss of ACE2 exacerbates myocardial remodelling by modulating the levels of MMPs.

Methods 10-week old male wildtype (WT, Acc2+/y) and ACE2 knockout (ACE2KO, Acc2–/–) mice received with mini-osmotic pumps (model 1002; USA) with a pressor dose of Ang II (1.5 mg kg–1 d–1) or saline for 2 weeks. Pro and cleaved forms of MMP2 and MMP9 were detected by gelatine zymography, and total collagenase and gelatinase activities were measured using fluorescent-based activity assays from EnzCheck (Molecular Probes). The membrane-anchored collagenase membrane type 1 (MT1)-MMP, the fibrotic factors transforming growth factor-β1 (TGF-β1) and fibronectin levels in heart were determined by TaqMan real-time PCR and western blotting analyses, respectively.

Results In response to chronic stimulation by Ang II, there were significant increases in myocardial expression of MMP2, MMP9 and MT1-MMP in both WT and ACE2KO mice with elevated plasma Ang II levels. Furthermore, loss of ACE2 resulted in greater increases in Ang II-mediated expression of pro MMP2 and active MMP2 and MMP9 in ACE2KO hearts associated with enhanced expression of MT1-MMP, TGF-β1 and fibronectin and elevated activities of gelatinase and collagenase. These changes were linked with a degraded and disorganised ECM in the Ang II-treated ACE2KO heart by picrosirius red staining.

Conclusions ACE2 deficiency exacerbates Ang II-mediated adverse myocardial remodelling by modulating the levels of MMP2, MMP9 and MT1-MMP and enhancing the expression of TGF-β1 and fibronectin, implying a critical role of ACE2 in regulating the balance between generation and degradation of myocardial extracellular matrix and potential therapeutic approaches by enhancing ACE2 action for patients with heart diseases. This work was supported by National Natural Science Foundation of China (80973522 & 81170246), Shanghai Pujiang Talents Programme (11PJ1408300) and the Canadian Institute for Health Research (86602 & 84279).

Objectives The purpose of present study was to investigate the effect of CIHH on CSB and the underlying mechanism in developing rat.

Methods Neonatal male Sprague-Dawley rats were randomly divided into four groups: 42-day CIHH treatment group (CIHH 42), 56-day CIHH treatment group (CIHH 56), 42-day control group (Con 42) and 56-day control group (Con 56). CIHH neonatal rats with the maternal rats were exposed to hypoxia mimicking 5000 m altitude (O2:11.1%) in a hypobaric chamber for 42 and 56 days, 6 h per day, respectively. The control animals lived in the same environment as the CIHH animals with free access to food and water excepting hypoxia. Isolated carotid sinus perfusion technique was used to record the CSB in anaesthetised developing rats. The parameters used to evaluate the CNS include Peak slope (PS), Reflex decrease (RD), Threshold pressure (TP), Equilibrium pressure (EP) and Saturation pressure (SP).

Conclusions Our data showed that blockade of CCR2 with RS504393 prevented renal damage induced by DOCA-salt hypertension independently of their effects on blood pressure. The results suggest that CCR2-mediated monocyte/macrophage infiltration may contribute to renal damage induced by salt-sensitive hypertension.
Extracellular Ubiquitin via CXC Chemokine Receptor 4 Enhances Platelet Activity by Ubiquitination of Cyclooxygenase-1

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Objectives To investigate the mechanism of extracellular ubiquitin (Ub) influence on the platelet functions.

Methods The arachidonic acid (AA)-preincubated healthy platelets were treated with different concentrations of extracellular Ub (50, 100, 500 and 1000 ng/ml), or AMD3100 (50, 100, 500 and 1000 ng/ml) (antagonist of CXCR4) prior to extracellular Ub (1000 ng/ml). Platelet functions were determined by light-transmission platelet aggregometry (LTA) or thrombelastography (TEG) platelet mapping. The protein expressions of CXCR4 and ubiquitinated proteins, including ubiquitinated COX-1, were detected by western blot or Immunoprecipitation (IP).

Results LTA or TEG showed that the activity of platelet exposed to extracellular Ub at 100, 500 and 1000 ng/ml was significantly increased compared with that at 50ng/ml. The increased activity was positively correlated with the levels of ubiquitinated proteins in the platelets. However, AMD3100 dose dependently counteracted the effect of Ub, and the platelet aggregation decreased accordingly. Further, CXCR4 could be activated by extracellular Ub or inhibited by AMD3100 dose dependently, and the level of CXCR4 was correlated with the ubiquitinated proteins, including ubiquitinated COX-1, in the platelets. IP experiments showed that the ubiquitinated proteins in the platelets contained ubiquitinated COX-1, whose levels were correlated with the expressions of ubiquitinated proteins. Inhibition of CXCR4 by AMD3100 caused a dose-related decline in ubiquitinated COX-1, which was correlated positively with platelet activity.

Conclusions The data suggested that extracellular Ub dose dependently, via CXCR4 pathway, facilitated its internalisation into the platelet to enhance the ubiquitination of COX-1, which contributed to the increase in platelet activity.

GW23-e2616 EFFECT OF LIGUSTRAZINE AGAINST MYOCARDIAL ISCHAELMIA-REFPERITION INJURY IN RATS

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Objectives The effect of ligustrazine (2,3,5,6-tetramethylpyrazine, TME) on myocardial ischaemia reperfusion (IR) and the role of nitric oxide (NO) was investigated in a rat IR model.

Methods The animal model was built by ligation of the left anterior descending artery of rats. Sprague-Dawley rats were randomly divided into sham, IR (35 min of regional ischaemia followed by 120 min of reperfusion), 3 TMP pretreated (TMP pretreated, 5, 10, 50 mg/kg intravenous injection, 5 min before ligation) and TMP+L-NAMe group. Infarct size, light microscopic evaluation, myocardial superoxide dismutase (SOD) activity, malondialdehyde (MDA) content, myeloperoxidase (MPO) activity, the level of interleukin-1β (IL-1β) as well as NO production were measured.

Results Pretreatment with middle and high dose of TMP markedly decreased infarct size ((58.7±4.5)%), (55.2±2.3)% vs IR (54.4±4.6)%), p<0.05, respectively), increased SOD activity (50.2±3.2 U/mg, 51.2±6.4 U/mg vs IR 35.6±4.3 U/mg, p<0.05, respectively). Middle and high dose of TMP pretreatment decreased MDA content (0.417±0.069 nmol/mg, 0.351±0.023 nmol/mg vs IR 0.693±0.053nmol/mg, p<0.05, respectively), increased MPO activity (6.237±0.901 U/mg, 6.201±1.263 U/mg vs IR 35.6±4.3 U/mg, p<0.05, respectively) and the level of IL-1β (0.140±0.021, 0.132±0.027 pg/mg, vs IR 0.235±0.026 pg/mg, p<0.05). TMP pretreatment also alleviated the neutrophil infiltration and increased the NO level (0.404±0.041 μmol/g in the TMP-M group, 0.453±0.067 μmol/g in the TMP-H group vs 0.295±0.032 μmol/g in the IR group, p<0.05). However, these effects could be significantly reversed by L-NAMe which abolished the increase of NO production brought by TMP.

Conclusions In conclusion, ligustrazine attenuated myocardial IR injury by a dose-related manner. The cardioprotective effect of ligustrazine may relate to its effects of increasing the level of NO, decreasing the inflammatory and oxidative stress.

GW23-e2638 LIPID CONTROL AND USE OF LIPID-LOWERING DRUGS FOR SECONDARY PREVENTION OF CARDIOVASCULAR EVENTS IN TAIWAN: THE TAIWANESE SECONDARY PREVENTION FOR PATIENTS WITH ATHEROSCLEROTIC DISEASE (T-SPARCLE) REGISTRY

Wei-Hsian Yin, Wei-Hsian Yin. taibezhexong

Objectives The aim of the present study was to examine treatment patterns, goal attainment, and factors influencing treatment among patients with stable symptomatic atherosclerotic disease in Taiwan.
Methods T-SPARCLE is a multi-centre, prospective registry enrolled 3486 outpatients with atherothrombotic disease (established coronary artery disease, cerebrovascular disease, or peripheral arterial disease) from 18 medical centres and regional hospitals in Taiwan. Among them, 2691 (77%) received at least one lipid-lowering drug and 2285 (65%) of them were receiving statin monotherapy. Most patients (92%) received statins at medium or lower equipotency doses. In this patient population with established CVD, 54% of patients attained ATP III targets for low-density lipoprotein cholesterol (LDL-C). The mean total cholesterol was 177 mg/dl, mean LDL-C was 101 mg/dl, mean high-density lipoprotein cholesterol was 46 mg/dl, and mean triglyceride was 146 mg/dl, respectively. Multivariate analysis identified three independent factors that were directly associated with goal attainment: the presence of hypertension (OR 1.49, 95% CI 1.13 to 1.95, p=0.004), previous history of stroke (OR 1.57, 95% CI 1.10 to 2.24, p=0.014), and previous history of myocardial infarction (OR 0.65, 95% CI 0.50 to 0.89, p=0.004).

Results T-SPARCLE is a multi-centre, retrospective registry enrolled 3486 outpatients with atherothrombotic disease (established coronary artery disease, cerebrovascular disease, or peripheral arterial disease) from 18 medical centres and regional hospitals in Taiwan. Among them, 2691 (77%) received at least one lipid-lowering drug and 2285 (65%) of them were receiving statin monotherapy. Most patients (92%) received statins at medium or lower equipotency doses. In this patient population with established CVD, 54% of patients attained ATP III targets for low-density lipoprotein cholesterol (LDL-C). The mean total cholesterol was 177 mg/dl, mean LDL-C was 101 mg/dl, mean high-density lipoprotein cholesterol was 46 mg/dl, and mean triglyceride was 146 mg/dl, respectively. Multivariate analysis identified three independent factors that were directly associated with goal attainment: the presence of hypertension (OR 1.49, 95% CI 1.13 to 1.95, p=0.004), previous history of stroke (OR 1.57, 95% CI 1.10 to 2.24, p=0.014), and previous history of myocardial infarction (OR 0.65, 95% CI 0.50 to 0.89, p=0.004).

Conclusions LDL-C goal attainment in patients with established CVD is still unsatisfactory in Taiwan, up to one half of them are still inadequately treated. More effective strategies, including multidisciplinary approach to improved guideline adherence and revision of insurance reimbursement guidelines may facilitate goal attainment.

GW23-e2534
ROLE OF TGF-β1/SMADS PATHWAY IN CAROTID ARTERY REMODELLING AND PREVENTION OF ENALAPRIL AND AMLODIPINE IN RENOVASCULAR HYPERTENSIVE RATS

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Objectives To investigate the role of TGF-β1/Smads pathway in carotid artery remodelling in renovascular hypertensive rats and the prevention of enalapril and amlodipine.

Methods The renovascular hypertensive rats (RHR) developed by ‘two-kidney and one-clip’ method were treated consecutively with distilled water (model group, n=6), enalapril (10 mg/kg/d, n=6), amlodipine (50 mg/kg/d, n=6) for 6 weeks. Six sham-operated rats were used as controls. Carotid artery morphology and structural changes in the media were observed by HE staining, immunohistochemical staining and Masson staining. Media thickness (MT), lumen diameter (LD), media thickness and lumen diameter ratio (MT/LD) and collagen fibre area percentage of carotid arteries were measured. In addition, the immunohistochemical staining was applied to detect the expression of α-smooth muscle actin (α-SMA), proliferating cell nuclear antigen (PCNA), TGF-β1, p-Smad2/3 and Smad7.

Results MT, LD, MT/LD, α-SMA, PCNA and collagen fibre area percentage of carotid arteries in the model group were higher than those in the sham-operated group (p<0.01), and TGF-β1 and p-smad2/3 were significantly increased compared to sham-operated group. Smad7 was much lower in the model group (p<0.01). Single therapy of enalapril or amlodipine decreased MT, MT/LD and the protein expression of TGF-β1, p-Smad2/3, and increased the expression of Smad7. The combination treatment of enalapril and amlodipine was significantly better than that in single amlodipine group (p<0.05), but not in single enalapril group.

Conclusions In RHR, TGF-β1/Smads pathway may participate in the mechanism of carotid artery remodelling. The enalapril or amlodipine could attenuate carotid remodelling of RHR through the intervention in TGF-β1/Smads pathway. The combination of enalapril and amlodipine is better than amlodipine therapy.

GW23-e2107
FUNCTIONAL EXPRESSION OF TSH RECEPTOR IN THE VENTRICLE OF RATS AND MICE: INVOLVEMENT A REGULATION OF HMGCGR BY TSH VIA THE CAMP/PKA/CREB SIGNALLING PATHWAY

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Objectives Elevated thyroid-stimulating hormone (TSH) and hypercholesterolemia commonly coexist, as typically seen in subclinical hypothyroidism, which can lead to and aggravate heart disease if it gets serious. However, there is no known whether TSH plays direct action on the heart. In the present study, we investigated the expression and function of thyrotropin receptor (TSHR) in ventricle tissue and myocytes. We further examined that TSH regulate the expression of 3-hydroxy-3-methyl-glutaryl coenzyme A reductase (HMGR), a rate-limiting enzyme in cholesterol synthesis, by interacting with TSHR in ventricular myocytes. Our research provides a new insight into explore the mechanism of hypothyroid cardiomopathy.

Methods Rat ventricle myocyte cell line H9C2 cells, ventricle tissues of normal Wistar rats as well as BALB/c and C57BL/6J mice were selected as research samples. Rat thyroid cell line FRTL-5 cells were used as the positive controls. TSHR mRNA expression was measured using Reverse-Transcription (RT); While the expression of TSHR protein was measured using western blotting and immunofluorescence, respectively.

(2) After starved in 2% CS-FBS medium to achieve synchronisation, doTSH respectively before subsequent stimulation with bTSH for 48 h. The intracellular cAMP production and the expression of pCREB and HMGCR were examined, respectively.

(3) H9C2 cells were pre-incubated with the adenylyl cyclase inhibitor SQ22536 or cAMP-dependent protein kinase A (PKA) inhibitor H89 respectively before subsequent stimulation with bTSH for 48 h. The intracellular cAMP production and the expression of pCREB and HMGCGR were examined, respectively.

(4) To further investigate the role of TSH in the regulation of HMGCGR in the ventricle in vivo, we employed Tsh−/− type
(supplement with exogenous T4) and wild type C57BL/6 mice. Testing the expression of HMGCR mRNA and protein and pCREB protein in ventricle tissue using real-time PCR and immunohistochemistry, respectively. Echocardiography was used to assess mouse heart function.

Results

1. TSHR mRNA and protein expression was present in both the ventricle tissue and myocytes of rats and mice. TSHR protein was located in H9C2 cell membrane as same as FRTL-5 cells.
2. bTSH stimulated the accumulation of cAMP production in H9C2 cells in dose-and time dependent manners (all p<0.05), indicating TSHR was functional in ventricle myocytes.
3. Treatment with bTSH resulted in either the expression of pCREB protein, HMGCR mRNA and protein or the BNP secretin in dose- and time-dependent manners (all p<0.05).
4. The above bTSH-stimulated effects were not only blunted by SQ22556 but also by H89, indicating TSH up-regulated HMGCR expression through cAMP/PKA/pCREB signaling pathway.
5. The immunohistochemical results of mouse ventricle tissue showed that HMGCR protein mainly expressed in cytoplasm while pCREB protein expressed in cell nuclei. In comparison to wild type mice, the expression, in left ventricle of Tshr−/− type mice, of HMGCR mRNA and protein and pCREB protein was significantly reduced by 15–36% (p<0.05). The results from Echocardiography demonstrated there was no significant difference in LVEF, LVEDD, LVFWT, EF and FS between the two type mice (p>0.05).

Conclusions

Functional TSHR exists in ventricle tissue and myocytes. TSH induces ventricle myocyte HMGCR expression through cAMP/PKA/pCREB and promotes BNP secretion, which is dependent of TSHR.

GW23-e0983

ABCG1 PLAYS AN IMPORTANT ROLE IN KEEPING ENDOPLASMIC RETICULUM STRESS

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Objectives

ATP binding cassette (ABC) transporters play an important role in regulating sterol homeostasis in many cell types. Endothelial cells (EC) have a high capacity to efflux sterols and express the ABC transporter ABCG1. It is reported that ABCG1 deficiency increases inflammatory responses in vascular EC and intracellular free cholesterol accumulation can activate endoplasmic reticulum stress (ERS). Here, the study was observed to object the relationship between ABCG1 and endothelial protection and concerned mechanism of ERS.

Methods

Recombinant ABCG1 overexpression plasmid and siRNA ABCG1 were transfected into human umbilical vein endothelial cells (HUVECs). Real-time PCR and Western blot were explored to exam ABCG1 expression. The rate of cholesterol efflux to HDL was measured by scintillation counting, and intracellular lipid content was measured by enzymatic fluorometric method. Endothelial activation was measured by eNOS expression and NO activity. In addition, the level of IL-6 and TNFα were measured by ELISA. GRP78 and CHOP protein expression were used to show activated ERS.

Results

Using siRNA, we obtained a significant 70% reduction in ABCG1 mRNA expression in HUVECs. Compared with normal controls, downregulation of ABCG1 by siRNA decreased eNOS protein expression by 50% and NO activity by 50% accompanied with decreased intracellular cholesterol efflux in HUVECs. Moreover, levels of IL-6 and TNFα in ABCG1 siRNA endothelial cells were increased by 3 and 4 times respectively. Similarly, GRP78 and CHOP protein expression were significantly increased 3 and 4 times in ABCG1 siRNA endothelial cells. On the contrary, upregulation of ABCG1 using recombinant overexpression plasmid decreased GRP78 and CHOP protein expression and conversely increased eNOS protein expression by 20% and NO activity by 20%.

Conclusions

There appears to be a critical link between ABCG1 expression and endothelial function in vascular EC. ABCG1 deficiency promotes endothelial activity that seems to be associated with activated ERS. Upregulation of ABCG1 has an effective effect on protection of endothelial function.

GW23-e0904

METHYLATION OF P15INK4B AND EXPRESSION OF ANRIL ON CHROMOSOME 9P21 ARE ASSOCIATED WITH CORONARY ARTERY DISEASE

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Objectives

Genome-wide association studies have identified that multiple SNPs on Chr9p21 are tightly associated with CAD. However, the mechanism linking this risk locus to CAD remains unclear.

Methods

The methylation status of six candidate genes (BAX, BCL-2, TIMP3, p14ARF, p15INK4b and p16INK4a) in 205 patients and controls who underwent coronary angiography were analysed by quantitative MethLight assay. Rs10757274 was genotyped and expression of INK4/ARF and antisense non-coding RNA in the INK4 locus (ANRIL) was determined by real-time RT-PCR. Serum levels of TGF-β1 were measured by ELISA.

Results

Compared with controls, DNA methylation levels at p15INK4b promoter significantly increased in CAD patients (p=0.006). The rs10757274 genotype was significantly associated with CAD (p=0.003) and GG genotype carriers had a higher level of ANRIL exon 1–5 expression compared among three genotypes (p=0.009). There was a stepwise increase in p15INK4b and p16INK4a methylation as ANRIL exon 1–5 expression elevated (r=0.23, p=0.001 and r=0.24, p=0.001, respectively), although neither of two loci methylation was directly linked to rs10757274 genotype.

Conclusions

p15INK4b methylation is associated with CAD and ANRIL expression. The epigenetic changes in p15INK4b methylation and ANRIL expression may involve in the mechanisms of Chr9p21 on CAD development.

GW23-e1785

FFTY720 POST-TREATMENT PROTECTS THE CARDIAC MICROVESSELS OF DIABETES IN I/R HEART INJURY: THE PIVOTAL ROLE OF S1P1/3 MEDIATED REGULATION

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Objectives

Diabetes is associated with an increase in the risk of developing coronary artery disease. And the pathological role played by cardiac microvessel is significant, nonetheless, the mechanism of which remains uncertain. Sphingosine-1-phosphate receptor 1/S (S1P1/3) are proved to make excessive contribution to vascular stabilisation, suggesting their possible role in cardiac I/R injury in diabetes. FTY720 is a specific agonist for S1P1/3.
However, it has not been addressed whether and how FTY720 could be developed as a therapeutic approach for cardiac microvascular I/R dysfunction in diabetes. Therefore, the purpose of present report is to provide a detailed study on the importance of S1P1/3 and its possible mechanism in cardiac I/R injury in diabetes, and the potential protection of FTY720 post-treatment.

Methods Experiment in vivo: Diabetic rat was induced with a single intraperitoneal injection of streptozotocin (50 mg/kg); I/R operation was performed at the 8th week and FTY720 (1 mg/kg, i.p.) was performed 10 min before 3 h reperfusion according to experimental designing. All rats were divided into four groups: Con, DM, Con+I/R, DM+I/R, DM+I/R+FTY720. The evaluation included: (1) Hemodynamic properties recording via retrograde cannulation; (2) Angiogenesis and permeability observations under electron microscope; (3) Histopathologic analysis including CD31 immunofluorescence for vascular endothelial cell and TUNEL for apoptosis; (4) Double staining of Thioflavin S and Evans blue for assessing microvascular no-reflow region; (5) Laser capture microdissection obtaining endothelium cells for subsequent mRNA analysis of S1P1, S1P3 and PKCβII.

Experiment in vitro: Cardiac microvascular endothelial cells (CMECs) were isolated and cultured in different groups; PKCβII over-expression, SI/R (30 min/3 h) and FTY720 treatment (10 nmol/l) before reperfusion was performed according to experimental designing. The groups were assigned as HG (25 mmol/l), Con, HG, Con+SI/R, HG+SI/R, HG+SI/R+FTY720, HG+SI/R +FTY720+PKCβII. A serial detections included: (1) CMECs identification by AclLDL and CD31 staining; (2) apoptosis assessment by TUNEL; (3) permeability of CMECs monolayer by FITC-Dextran clearance; (4) expression analysis of S1P1, S1P3 and PKCβII by western blot.

Results Compared with Con group, obvious permeability dysfunction and highly irregular angiogenesis with numerous extravaginations and invaginations were observed in diabetes. After cardiac I/R injury, accompanying with impaired cardiac microvascular barrier function aggrandised no-reflow region and increased apoptosis of endothelial cell, significant up-regulation of S1P1 and PKCβII, and translocation of S1P3 were obtained (p<0.01). Interestingly, FTY720 was effective to redress these pathological changes by regulating S1P1/3. However, experiment in vitro also demonstrated PKCβII overexpression could weaken the protective effects of FTY720, but without any influence on S1P1 and S1P3 (p>0.05), which indicated PKCβII might be a key factor in the downstream of S1P1/3 mediated signalling.

Conclusions Our findings not only firstly defined an important role of S1P1/3 for cardiac microvascular I/R injury in diabetes, but also revealed the unique treatment of FTY720 as an agonist for S1P1 and functional antagonist for S1P3. This would provide a novel conceptive foundation for protecting cardiac microvessel, which may retard or prevent the deterioration of cardiac function of patients with diabetic heart disease.

GW23-e1772

EFFECTS OF SHEXIANGBAOXIN PILLS ON THE EXPRESSION OF CARDIAC α1- AND β-ADRENERGIC RECEPTOR SUBTYPES IN RAT HEARTS WITH HEART FAILURE INDUCED BY MYOCARDIAL INFARCTION

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Objectives Chronic heart failure (CHF) had been characterised as an activated sympathetic system leading to the alteration of adrenergic receptor (AR) levels in the heart. Thus far, not much research has been done with regard to traditional Chinese medical treatment for CHF. We investigated the effect of Shexiangbaoxin pills (SBXP) on the function of the heart and the expression of α1-AR and β-AR subtypes in the messenger RNA (mRNA) levels and protein levels of non-infarction left ventricular tissue from rats with CHF induced by myocardial infarction.

Methods Models of CHF were established by left anterior descending coronary artery ligation. Fifty-four Wistar rats were randomly divided into five groups: normal control group (group A), sham operation group (group B), CHF model group (group C), positive medicine control group (group D), and small-dose SBXP group (group E) and large-dose SBXP group (group F), deployed intra-gastrically. Cardiac function was examined by echocardiography before and after therapy; mRNA expressed levels were measured by semiquantitative reverse transcription polymerase chain reaction (RT-PCR) for b1-AR, b2-AR, b3-AR, a1A-AR, a1B-AR, and a1D-AR; protein levels were measured by western blotting analysis for b1-AR, b2-AR, a1A-AR, a1B-AR, and a1D-AR in non-infarction left ventricular tissue.

Results There was no significant difference in the left ventricular ejection fraction (LVEF) between groups A and B. Compared to group B, LVEF of groups C, D, E, and F were significantly decreased (p<0.01) before therapy. After therapy, compared to group C, LVEF of group F was significantly improved (p<0.05). Compared to group B, b1-AR and a1B-AR expressed levels were markedly decreased (p<0.05), a1A-AR and b2-AR were significantly increased (p<0.01) in group C, and in both mRNA and protein expressed levels b2-AR had no significant difference between groups B and C (p>0.05). a1D-AR mRNA levels were unchanged in each group (p>0.05), but a1D-AR protein level was significantly decreased in group C (p<0.05). After treatment, compared to group C, mRNA levels of b1-AR and a1B-AR were significantly increased (p<0.05 and F<0.01), and a1A-AR was markedly decreased in groups D, E, and F (p<0.05). b2-AR level significantly declined in both groups D and F (p<0.01), but b2-AR and a1D-AR expressed levels remained unchanged in each group (p>0.05). Protein levels, compared to group C, b1-AR was significantly increased (p<0.01, p<0.05, and p<0.01) and a1A-AR was markedly decreased in groups D, E, and F (p<0.05, p<0.01, and p<0.01). b2-AR expressed level was significantly increased in group F (p<0.05). a1B-AR expressed level was significantly increased in both groups E and F (p<0.05), and a1D-AR was remarkably increased in both groups D and F (p<0.05).

Conclusions After SBXP treatment, LVEF was increased and cardiac function was significantly ameliorated in rats with CHF. The therapeutic effect of SBXP may be related to better blood supply for myocardium and up-regulation of b1-AR and a1B-AR, and down-regulation of a1A-AR and b3-AR. The results show that SBXP can be used in treatment of CHF and the therapeutic effect of large-dose SBXP is superior to small-dose SBXP.
unlimited growth, self-renewal and differentiate into all types of mature tissue cells. Angiotensin II (Ang II), the most important effector peptide of the renin–angiotensin system, is also an angiogenesis factor. This study attempted to explore the potential impact of Ang II on ES cells differentiation and the underlying mechanisms.

**Methods** Mouse embryonic stem cells (ES-D3) were plated on collagen IV-coated dishes/flasks in differentiation medium for 2, 4, 6, 8 days, and a panel of smooth muscle specific markers, including smooth muscle α-actin (SMA), calponin, SM22, mouth muscle myosin heavy chain (SM-MHC) were detected by qRT-PCR and western blot. When the 4-day predifferentiated ES cells were pretreated with different concentrations (10^{-10}–10^{-8} mol/l) of Ang II for 48 h, the mRNA, protein expression and immunofluorescent staining of smooth muscle specific markers were also detected. Besides, the 4-day predifferentiated ES cells were pre-incubated with different inhibitors, such as Ang II type 1 (AT1) receptor antagonist losartan (25 μmol/l, 50 μmol/l), Ang II type 2 (AT2) receptor antagonist PD123319 (1 μmol/l, 10 μmol/l), NF-κB inhibitor BAY11-7082 (5 μmol/l) and phosphoinositide-3 kinase (PI3K) inhibitor LY294002 (10 μmol/l), and the related expression of smooth muscle specific markers and phosphor-Akt were detected by western blot. The SMA and SM22 promoter activity on different concentrations of Ang II (10^{-11}–10^{-8} mol/l) were detected by Luciferase reporter assay, and transcription factors c-Jun, NF-κB p50, NF-κB p65 were accordingly analysed by qRT-PCR. Finally, the protein expression of two proinflammatory factors, TNF-α and c-fos during Ang II (10^{-7} mol/l) stimulation were detected by western blot.

**Results** We have successfully induced the differentiation of ES cells into vascular smooth muscle cells (SMCs) on collagen IV, and a panel of SMC-specific genes was significantly and consistently upregulated. Interestingly, incubation of ES cells with Ang II further promote SMC differentiation from ES cells, which was abolished by prior treatment with Ang II type 2 (AT2) receptor antagonist PD123319 (p<0.01, but not Ang II type 1 (AT1) receptor antagonist losartan (p>0.01). Ang II can directly promote the smooth muscle specific markers expression at the transcription level, as revealed that Ang II increased SMA-reporter activity, with the discernable effect observed at 10^{-7} mol/l and 10^{-9} mol/l (p<0.05). Moreover, we found that, in parallel with SMC specific markers induction, the expression levels of phosphor-Akt and NF-KappaB (NF-κB) p50 were upregulated by Ang II, with the maximum stimulation observed at 10^{-8} mol/l (p<0.01). Importantly, addition of phosphoinositide-3 kinase (PI3K) inhibitor LY294002 led to a marked inhibition of Ang II induced VSMC specific markers, phosphor-Akt and NF-κB p50 expression (p<0.01). Furthermore, NF-κB inhibitor BAY11-7082 can inhibit Ang II induced expression of SMC specific markers (p<0.01). However, the protein expression of two proinflammatory factors TNF-α and c-fos were not changed much (p>0.05).

**Conclusions** Thus, we demonstrate for the first time that Ang II plays a promotive role in the stage of ES cells differentiation to SMCs through AT1 receptor. We further confirmed that PI3K/Akt signalling pathway and NF-κB plays a key role in this process. Besides, Ang II can directly promote the smooth muscle specific markers expression at the transcription level, through stimulating many transcription factors especially transcription factor NF-κB p50, which may have the close relationship with SMC differentiation. However, the physiological effect of Ang II was not related with inflammation.

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**ABSTRACTS**

**INHIBITION OF MICRORNA LET-7I DEPRESSES MATURATION AND FUNCTIONAL STATE OF DENDRITIC CELLS IN RESPONSE TO LPS STIMULATION VIA TARGETING SOCS1**

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**Objectives** Dendritic cells (DCs) can initiate immune responses or confer immune tolerance depending on functional status. MicroRNAs (miRNAs) are critical for the regulation of DC function and immunity. Therefore, we try to find some miRNAs that can dynamic regulate DC maturation so as to further modulate specify antigen-specific immune responses.

**Methods** Bone marrow-derived DCs were generated and stimulated by LPS. To manipulate let-7i in DCs before LPS stimulation, cultured DCs were transfected with let-7i mimic or inhibitor. The maturation and functional state of DCs were assessed by Flow cytometry, MLR assay and ELISA. The subpopulation of DCs were separated by MACS. The target gene of let-7i was proved by luciferase assay, western blots, immunofluorescence and qRT-PCR.

**Results** We found that the miRNA let-7i was up-regulated during LPS-induced DC maturation. Down-regulation of let-7i significantly impeded DC maturation as evidenced by reduced CD80 and CD86 expression. DCs stimulated by LPS (LPS-DCs) promoted T-cell proliferation in co-culture, while LPS-stimulated DCs with down-regulated let-7i were not effective at stimulating T cell proliferation but promoted expansion of the regulatory T cell (Treg) population. There were two subpopulations of LPS-stimulated DCs with down-regulated let-7i, CD86+ and CD86−, and it was the CD86+ DCs that were more effective in inducing T cell hyporesponsiveness and enhancing Treg numbers, indicating that this DC population had tolerogenic properties. Furthermore, Treg with up-regulated IL-10 underscored the tolerogenic effect of CD86− DCs. Suppressor of cytokine signalling 1 (SOCS1), a crucial mediator of DC maturation, was confirmed as a let-7i target gene by luciferase construct assay. Suppression or overexpression of let-7i caused reciprocal alterations in SOCS1 protein expression, but had no significant effects on SOCS1 mRNA levels, indicating that let-7i regulated SOCS1 expression by translational suppression. The modulation of SOCS1 protein by let-7i was mainly restricted to CD86+ DCs.

**Conclusions** Our study demonstrates that let-7i regulation of SOCS1 is critical for LPS-induced DC maturation and immune function. Dynamic regulation of let-7i may fine tune immune responses by inducing antigen-specific immune tolerance.

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**ORAL ADMINISTRATION OF DOXYCYCLINE PREVENTS VULNERABLE PLAQUES FROM RUPTURE INDEPENDENT OF SERUM LIPID LEVELS (AN ANIMAL EXPERIMENT WITH RABBITS)**

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**Objectives** Chronic inflammatory responses have been implicated in the process of atherosclerosis. Doxycycline, as a broad spectrum antibiotic, has also proven effective in inhibiting MMF. The aim of this study was to evaluate the effect of doxycycline treatment on
stabilising the vulnerable plaque in the New Zealand white rabbits.

Methods Thirty New Zealand white rabbits were then randomly divided into group A (n=10), group B (n=10), group C (n=10). All underwent balloon-induced abdominal aortic endothelial injury and were fed a diet of 1% cholesterol for 8 weeks. The rabbits in Group A were given doxycycline (10 mg/kg/d). The rabbits in Group B were given simvastatin (5 mg/kg/d). The rabbits in Group C were the control group. All three groups were given high cholesterol food. 12 weeks later, pharmacological triggering was performed with the injection of Chinese Russell’s viper venom and histamine in both groups. The concentration of doxycycline in rabbit’s plasma was determined by HPLC. Serum lipids and inflammatory markers were measured and high frequency ultrasonography and intravascular ultrasound (IVUS) imaging were performed to measure the intimal media thickness (IMT), the external elastic membrane area (EEMAA), the plaque area (Pa) and the plaque burden (PB) of the abdominal aorta. Plaque contents were evaluated by immunohistochemistry and the vulnerability index (VI) was calculated. The mRNA expressions of inflammatory markers in the plaques were assessed by RT-PCR.

Results The results showed that doxycycline resulted in a significant inhibition of IMT (p<0.05) (A: 0.84±0.16 mm; B: 0.79±0.14 mm; C: 1.35±0.26 mm) and significantly increased the thickness of the plaque caps (A: 257±62 μm; B: 283±72 μm; C: 123±52 μm) and decreased VI, IMT, EEMAA, Pa, PB in doxycycline treatment group (all p<0.05), there was significant difference in vulnerability index in doxycycline treatment group (p<0.05) (A: 0.72±0.08; B: 0.52±0.10; C: 3.71±0.21). There was no significant difference in serum lipid levels in doxycycline treatment group, but the serum levels and the mRNA and protein expressions of inflammatory markers were significantly reduced in doxycycline treatment group (p<0.05) (Serum Inflammatory Markers in three Groups: hs-CRP A: 45.2±11.5 ng/ml; B: 40.7±8.9 ng/ml; C: 127.2±44.9 ng/ml; MCP-1 A: 30.4±6.2 pg/ml; B: 26.3±4.6 pg/ml; C:86.3±10.4 pg/ml; IL-8: A: 6.6±4.2 pg/ml; B:5.2±2.7 pg/ml; C: 20.1±14.7 pg/ml; IL-18: A: 55.9±12.5 pg/ml; B: 34.8±12.7 pg/ml; C: 92.7±40.8 pg/ml; MMP-1 A: 9.3±2.7 ng/ml; B: 11.7±4.2 ng/ml; C: 59.2±8.99 ng/ml; P-selectin:A:10.2±1.6 ng/ml;B:7.4±1.5 ng/ml; C: 32.1±4.9 ng/ml. mRNA expressions of Inflammatory Markers in Three Groups: MCP-1 A: 40.41±9.78%, B: 30.72±5.75%, C: 63.87±6.23%; MMP-1 A: 10.87±3.70%, B: 12.87±5.62%, C: 49.43±11.20%; MMP-3: A: 4.30±5.22%, B: 5.43±3.85%, C: 33.51±9.82%; MMP-12: A: 6.95±5.05%, B: 7.43±2.51%, C: 36.02±8.72%, P-selectin: A:20.94±6.09%, B:10.87±6.03%, C: 48.78±6.23%).

Conclusions Doxycycline effectively inhibits plaque inflammation and prevents vulnerable plaques from rupture. These therapeutic effects are independent of serum lipid levels and demonstrate the concept that inhibition of plaque inflammation alone without lipid lowering can stabilise vulnerable plaques.
mediators of vascular tone, are affected by arsenic trioxide in rat mesenteric artery smooth muscle cells (SMCs) and explore the electrophysiological mechanism of arsenic-related impaired channel function.

Methods Reagent Arsenic trioxide was purchased from Harbin YIDA pharmaceutical limited company. Dulbecco’s modified Eagle’s medium (DMEM), fetal bovine serum, and other cell culture reagents were obtained from Gibco (Grand Island, NY, USA). Polyclonal Kv1.5 antibody was obtained from Santa Cruz (Santa Cruz Biotech, Santa Cruz, CA), and polyclonal Kv1.2 and polyclonal Kv2.1 were obtained from Alomone (Alomone Labs, Jerusalem, Israel). Other reagents were purchased from sigma (St. Louis. Mo. USA).

The acute isolation and culture of vascular smooth muscle cells. Male Wistar rats (200–250 g) were anaesthetized by intraperitoneal injection of sodium pentobarbital (50 mg/kg bodyweight). Small mesenteric arteries below the second branch of the main mesenteric arteries were dissected out and placed in ice cold isolation buffer. The isolation buffer consisted of the following (in mmol/l): NaCl 136, KCl 5.4, HEPES 10, CaCl2 1.8, NaH2PO4 0.33, MgCl2 1, Glucose 1, with pH adjusted to 7.4 with NaOH. The small arteries were cut into 4 mm-long pieces and incubated at 37°C in isolation buffer containing 1 mg/ml albumin, 1 mg/ml papain, and 1 mg/ml dithioerythritol for 30 min, and for another 30 min in the isolation buffer containing 1 mg/ml albumin, 1 mg/ml collagenase II, and 1 mg/ml hyaluronidase, single cells were released through a Pasteur pipette. SMCs were cultured in low-glucose DMEM with 10% fetal bovine serum and 1% penicillin/streptomycin, and maintained in 95% air and 5% CO2 at 37°C. SMCs were passaged regularly and subcultured to 95% confluence before experiments. In order to observe the immediate effects of arsenic trioxide on Kv currents, the freshly isolated cells were treated with a variety of drug concentrations. The effects of arsenic trioxide on Kv currents were also observed in cultured cells treated with arsenic trioxide for 48 h. All experimental procedures were approved by Animal Ethics Committee of Harbin Medical University.

Electrophysiological recording

The whole cell Kv currents were recorded as described previ-ously.20 The SMCs on the coverslips were mounted on the stage of an inverted phase contrast microscope (Olympus IX70). The Voltage-gated K+ currents were recorded with an Axopatch 200B amplifier controlled by a Digidata 1332 interface and a Pclamp Software (V9.2, Axon Instrument Inc). Pipettes were pulled from soft microhematocrit capillary tubes with tip resistances of 2–4 MΩ when filled with the pipette solution. At the beginning of each experiment, junctional potential between the pipette solution and bath solution was adjusted to zero. The series resistance was electrically compensated to at least 70% to minimize the duration of capacitive transient. Test pulses were evoked with 10mV steps increase from -50 mV to +60 mV. The 1 mmol/l TEA was also applied to the bath solutions to minimize the activity of Ca2+-activated K+ channels. The holding potential was set at -60 mV at which Kv channels are not inactivated. I–V curves were constructed using the current amplitude measured between the 300–350 ms of the test pulse when the current amplitude became sustained. The bath solution was composed of (in mmol/l): NaCl 140, KCl 5.4, MgCl2 6 H2O, 10 HEPES, 1 EGTA, 10 Glucose, pH adjusted to 7.3 with NaOH. The pipette solution con-tained (in mmol/l): 140 KC1, 1 MgCl2 6 H2O, 10 EGTA, 10 HEPES, 5 Glucose, 2 Na2-ATP, pH adjusted to 7.3 with KOH. All experiments were conducted at room temperature (20–25°C).

Western Blot

The expression levels of Kv1.2, Kv1.5 and Kv2.1 protein were monitored using Western blot experiments. The vascular SMCs were incubated at 37°C in low-glucose DMEM with and without 8 μmol/l arsenic trioxide for 48 h. The cells were then harvested from the flask (Coring) using ice-cold phosphate buffered saline (PBS) and total protein was extracted. The protein expressions of Kv channels were determined using western blot analysis and expressed as a ratio with levels of GAPDH. Denatured protein was segregated using sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE), then transferred to PVDF membrane and incubated with primary antibodies against GAPDH (Affinity Reagents), polyclonal goat anti-Kv1.5 antibody (Santa Cruz) at 1:200 dilution, polyclonal rabbit anti-Kv1.2 antibody and polyclonal rabbit anti-Kv2.1 antibody (Alomone Labs) at 1:200 dilution. Donkey anti-goat Alexa Fluor 700 (dilution 1:4000, Molecular Probes) was used as Kv1.5 secondary antibody and goat anti-rabbit Alexa Fluor 700 (dilution 1:4000, Molecular Probes) was used as Kv1.2 and Kv2.1 secondary antibody. We used the Odyssey infrared fluorescent scanning system (LI-COR) to detect membrane protein. The β and densities were quantified by densitometry, using Scion Image Software.

Statistical analysis

Data were collected from repeated experiments and were presented as mean±SE. Student’s t-test was used for statistical analysis. A two-tail P<0.05 was taken to indicate a statistically significant difference.

Results We demonstrated that arsenic trioxide did not show immediately effects on Kv currents, but remarkably decreased Kv currents were observed after 48 h pretreatment with arsenic trioxide in SMCs. At +60 mV the amplitudes of Kv currents were decreased by 53.65%, 39.21% and 75.12% with treatment of 1, 4, and 8 μmol/l arsenic trioxide for 48 h, respectively. Furthermore, the expression of Kv1.2 channel and Kv1.5 channel protein was obviously decreased after 48 h pretreatment with arsenic trioxide, but the expression of Kv2.1 did not significantly alter.

Conclusions The present study documented two major findings: First, arsenic trioxide did not present immediate effect on Kv currents in rat mesenteric artery SMCs. Second, after 48 h pretreatment, arsenic trioxide impaired Kv channel function mainly through suppressing Kv1.5 and Kv1.2 subunits expression.

Although lots of investigations have reported that arsenic trioxide is strongly correlated with the development of vascular diseases, they mainly focused on epidemiological studies. Recently, Lee et al found that arsenic inhibited vascular relaxation by inhibiting NO production in endothelial cells with a suppression of cGMP dependent relaxation mechanisms. On the other hand, our results revealed arsenic impaired the Kv channel function which play an important role in regulation of vascular tone. Thus, the ablerent regulation of Kv channels by arsenic trioxide may cause the imbalance of vasodilatation and vasoconstriction which may contributes to the development of vascular diseases.

The present experimental results showed that arsenic trioxide did not produce immediately inhibitory effects on the Kv currents in rat mesenteric artery SMCs, indicating that arsenic trioxide did not affect Kv channel function by regulating its activation, inactivation gate. However, after 48 h pretreatment, arsenic trioxide did result in a concentration-dependent suppression of Kv currents through inhibiting Kv subunits Kv1.5 and Kv1.2, but not Kv2.1 which all are major functional components of Kv currents in rat mesenteric artery SMCs.

Kv channels were composed of pore-forming Kva and modulatory Kvβ subunits arranged in a complex. Among transcripts encoding the pore-forming Kva subunits, Kv1.2, Kv1.5, and Kv1.1 mainly contributed to Kv currents and played an important role in controlling vascular tone.26–29 Subunits Kv1.2, Kv1.5, and Kv2.1 are also major components of Kv currents in vascular myocytes from human pulmonary arteries and radial arteries, and rat mesenteric arteries, pulmonary arteries, cerebral vessels, etc. in human.
pulmonary artery smooth muscle cells, Kv1.5 subunit was showed to contribute to functional Kv channels, and regulate cellular membrane potential, vascular tone, and vascular proliferation and apoptosis. Abrupt Kv1.5 channel expression and function takes part in vascular remodelling of idiopathic pulmonary artery hypertension. Subunits Kv1.2 and Kv1.5 make greater contribution to Kv channels in rat coronary myocytes and regulate the resting vascular tone. Previous studies demonstrated that Kv1.2/1.5 heterotetrameric channels contribute to the resting membrane potential and diameter of rat small cerebral arteries in rat cerebral vascular meric channels contribute to the resting membrane potential and of [Ca2+]i and contraction caused by hypoxia and 4-AP in pulmonary artery.34 Intracellular administration of anti-Kv1.5 antibody causes more depolarisation in pulmonary arterial smooth muscle cells than anti-Kv2.1 antibody. The combination of anti-Kv1.5 and anti-Kv2.1 antibodies could produce greater depolarisation in resistance pulmonary artery than either alone. Consistently, the data from our research showed that both Kv1.2 and Kv1.5 are involved in the impairment of Kv by arsenic trioxide. The Kv1.5 expression was inhibited more potently by arsenic trioxide compared to Kv2.2 expression which implies Kv1.5 channel subunit possibly plays a major role in arsenic-associated vascular diseases.

Some studies showed that arsenic trioxide also present an inhibitory role in Kv currents in other tissues. For example, Zhou J reported that arsenic trioxide acutely decreased the Kv currents in a dose-dependent manner with a IC50 of 4.1 μmol/l in human multiple myeloma cells. Nevertheless, we found that arsenic did not acutely alter Kv currents in mesenteric arterial SMCs. This disparity possibly comes from the different subunits that formed Kv channels in various tissues. In the treatment of acute promyelocytic leukaemia and other tumours, the therapeutic dosage of arsenic trioxide is ranged from 0.1 μmol/l to 5 μmol/l. Some epidemiological investigations also showed that arsenic concentration in plasma can reach to these levels with the environmental exposure levels of arsenic. Accordingly, the concentration of arsenic trioxide used in the present study was related to its clinical application.

Our findings indicate arsenic-induced the impairment of Kv currents by suppressing subunits Kv1.5 and Kv1.2 may be involved the development of vascular diseases.

**Results** With LVESP≥150 mm Hg set as indicator of successful TAC (TAC+) and LVESP<150 mm Hg as unsuccessful (TAC-), receiver operating characteristic curve analysis demonstrated that post-operative inner diameter at aortic banding site (IDb), peak flow velocity at aortic banding site (Pvb), and peak flow velocity of right/ left common carotid artery (Pvr/l) at day 3 served as most effective predictors for LVESP at day14 (area under curve=0.9016, 0.9143, 0.8254, respectively. p<0.01 for all). Among all UBM parameters at day3, IDb, Pvb, right common carotid artery peak flow velocity (PR), and Pvr/l correlated best with LVESP at day14 (R2=0.5740, 0.6549, 0.5208, 0.2274, respectively, p<0.01 for all). Furthermore, IDb, Pvb, and Pvr/l at day3 most effectively predict long-term cardiac hypertrophy, using the cut-off values of 0.45 mm, 2698.00 mm/s, 3.08, respectively.

**Conclusions** UBM can be a noninvasive and effective option for early estimation of LVESP and prediction of successful TAC.

**GW23-e1073**

**C-MET OVEREXPRESSION PROMOTE REENDOTHELIALISATION AND INHIBIT NEOINTIMAL FORMATION AFTER BALLOON INJURY**

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**Objectives** to explore the effect of c-met overexpression in EPCs on reendothelialisation after balloon injury

**Methods** EPCs derived from mouse bone marrow were isolated and cultured. 3-[(5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide assays were used to evaluate EPC proliferation. Adenoviral vector expressing c-Met was generated using the AdEasy system. To evaluate the role of HGF/Met in vascular repair in vivo, we used balloon-injured rat carotid artery model. Evans Blue dye was administered to evaluate reendothelialisation after 10 days injury, and the neointimal formation was assessed at 21 days following vascular injury.

**Results** The effect of HGF on EPC proliferation was examined 48 h after exposure to different quantities of HGF (range 2–20 ng/ml). The proliferation effect was strongly dose-dependent and significantly increased in c-met-EPCs group compared with EPCs group. After transfection of c-met-EPCs or EPCs to balloon-injured rat via vessel, Evans Blue dye was administered to evaluate reendothelialisation after balloon injury. reendothelialised area was significantly larger in c-met-EPCs group than in EPCs group (46,25±8.90% vs 43,21±7.24%, n=5, p<0.01). A marked decrease in the neointimal area and I/M ratio was found in c-met–EPCs compared with EPCs group at day 21 (0,29±0,06 vs 0,63±0,13, n=5, p<0,01).

**Conclusions** c-Met overexpression improve EPCs proliferation, promote reendothelialisation and inhibit neointimal formation after balloon injury.
that humoral factors, including insulin, regulate both normal vessel homeostasis and abnormal arterial growth that occurs in vascular disease. Although the growth-promoting-effect of insulin on several types of cultured VSMCs has been demonstrated, the underlying mechanism remains vague.

MicroRNAs (miRNAs) are key regulators of gene expression, which are involved in many physiological cellular pathways, including cell growth, differentiation, and apoptosis. MiRNAs are initially transcribed by RNA polymerase II (Pol II) in the nucleus to form large pri-miRNA transcripts. The pri-miRNAs are processed by the RNase III enzymes, Drosha and Dicer, to generate 18- to 24-nucleotide mature miRNAs. The mature miRNAs regulate gene expression in one of two ways that depend on the degree of complementarity between the miRNA and its target. MiRNAs that bind to 3'UTR of mRNA with imperfect complementarity block protein translation. In contrast, miRNAs that bind to mRNA with perfect complementarity induce targeted mRNA cleavage. Currently, more than 400 miRNAs have been cloned and sequenced in human, and the estimated number of miRNA genes is more than 1000 in the human genome. As a group, miRNAs are estimated to regulate 30% of the genes of the human genome.

The role of miRNAs is well-established in the genesis of malignancy, given that cell dedifferentiation, growth, and apoptosis are important cellular events in the development of cancer. There is increasing evidence that miRNAs are expressed in the cardiovascular system and participate in many important biological functions. Because abnormal VSMC proliferation shares similar cellular events and molecular mechanisms with cancer, we hypothesised that endogenous miRNAs may be involved in insulin-induced VSMC proliferation and further contribute to the pathology of hypertension.

Methods VSMC proliferation was determined by 3H-thymidine incorporation; Specific miRNA changes in insulin stimulated VSMCs were detected by miRNA chips and real-time PCR. Target of the specific miRNA was predicted by bioinformatics analysis (TargetScan prediction programme, release 5.1). The relationship of the specific miRNA and the target was further demonstrated by luciferase reporter construct and luciferase assay. Cell cycle was analysed by Fluorescence-activated cell sorting (FACS) analysis and experimental approaches. P21 expression was determined by immunoblotting.

Results In this study, we found that insulin increased VSMC proliferation and miR-208 expression. Overexpression of miR-208 increased basal and insulin-mediated VSMC proliferation. Although miR-208 inhibitor, by itself, had no effect on VSMC proliferation, it reduced the insulin-mediated cell proliferation. Moreover, miR-208 increased the transformation of cell cycle from G1 phase to the S phase. Bioinformatics analysis found that p21, a member of the cyclin-dependent kinase (CDK)-inhibitory proteins family, may be the target of miR-208. Insulin decreased p21 expression in VSMCs; transfection of miR-208 also decreased p21 expression. In the presence of miR-208 inhibitor, the inhibitory effect of insulin on p21 expression in VSMCs was partially blocked. The interaction between miR-208 and p21 was direct. Using a luciferase reporter with entire wild-type p21 3'UTR or a mutant p21 3'UTR in HEK293 cells, we found that miR-208 decreased but neither miR-208 mimic nor the mutant p21 3'UTR had any significant effect on the luciferase activity.

Conclusions This study indicates that miRNAs, miR-208, in particular, are involved in the insulin-induced VSMC proliferation via down-regulation of its potential target, p21, a key member of CDK-inhibitory protein family and maybe further contribute to the pathology of hypertension.
Conclusions

STIM1 suppressed EPCs differentiation in vitro and 12 genes were underlying the process of vascular repair. reendothelialization, indicating a possible new mechanism through 14 day (p<0.05). Consistent with these was shown in Ad-si/rSTIM1-EPCs group compared with NSC-infected groups and Ad-si/rSTIM1+ Ad-hSTIM1-EPCs group rSTIM1-EPCs infected arteries was obviously less than that in model group.

Methods

Following balloon injury, EPCs, which were transfected with Ad-si/rSTIM1, Ad-hSTIM1 and Ad–non silencing control (NSC), were transplanted to the rat. Evans Blue dye was performed to measured reendothelialization at 7 and 14 day after injury, the serum NO level and total NOS activity were lower in model group than that of control group and drug group, while there is no difference between the latter two.

Results

Optical microscope revealed narrowed vascular lumen, thickened intima and numerous arteriosclerotic plaques in the model group compared with the control group, whereas the vascular lumen and intima thickness remained basically normal in drug group. The serum NO level and total NOS activity were lower in model group than that of control group and drug group.

Conclusions

Jiawei BHD can lessen intimal hyperplasia and vascular stenosis in iliac artery injury rabbits, this effect is possibly related with that Jiawei BHD activated the NO system.

GW23-e0077 KNOCKDOWN OF STROMAL INTERACTION MOLECULE 1 DOWN-REGULATES THE DIFFERENTIATION OF ENDO THELIAL PROGENITOR CELLS AND REENDO THELIALIZATION AFTER VASCULAR INJURY

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Objectives

The study was to investigate the effect of stromal interaction molecule 1 (STIM1) silencing on endothelial progenitor cells (EPCs) differentiation and reendothelialization.

Methods

Following balloon injury, EPCs, which were transfected with Ad-si/rSTIM1, Ad-hSTIM1 and Ad–non silencing control (NSC), were transplanted to the rat. Evans Blue dye was performed to measured reendothelialization at 7 and 14 day after injury, the neointimal formation was evaluated by staining with hematoxylin and eosin at 14 day after injury. EPCs differentiation was examined by western blot, and rat gene expression array was detected.

Results

At 7 and 14 day, the reendothelialized area in the Ad-si/rSTIM1-EPCs infected arteries was obviously less than that in NSC-infected groups and Ad-si/rSTIM1+ Ad-hSTIM1-EPCs group (p<0.05). A marked increase in the neointimal area and I/M ratio was shown in Ad-si/rSTIM1-EPCs group compared with NSC-transduced groups and Ad-si/rSTIM1+ Ad-hSTIM1-EPCs group at 14 day (p<0.05). Consistent with these findings, knockdown of STIM1 suppressed EPCs differentiation in vitro and 12 genes were downregulated by at least 100-fold during knockdown of STIM1 reduced EPCs differentiation, including C4-2, Sggc, LOC560904, Rhoj, Krt10, Ucp1, Thsp, Gpc3, Mgp, Hba-a2 and Igbp6.

Conclusions

Silencing of STIM1 inhibited EPCs differentiation and reendothelialization, indicating a possible new mechanism through EPCs underlying the process of vascular repair.

GW23-e1269 HYPOCHLOROUS ACID, A MACROPHAGES PRODUCT, INDUCES ENDOTHELIAL APOPTOSIS: THE ROLE OF ENDOPLASMATIC RETICULUM STRESS

doi:10.1136/heartjnl-2012-302920a.42

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Objectives

Hypochlorous acid (HOCl), a macrophages product can induce oxidative stress-induced mitochondrial damage in cardiac H9c2 muscle cells via an EGFRTK-ROS-Akt signalling pathway.

GW23-e0184 MORPHINE PREVENTS OXIDANT STRESS-INDUCED MITOCHONDRIAL DAMAGE VIA AN EGFRTK-ROS-AKT SIGNALLING PATHWAY IN H9C2 CARDIAC MUSCLE CELLS

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Objectives

Superficial erosion of coronary plaques due to endothelial loss causes acute coronary syndromes (ACS). Hypochlorous acid (HOCl), a macrophages product can induce
endothelial apoptosis. Disturbing (ER) function results in ER stress and unfolded protein response, which tends to restore ER homeostasis but switches to apoptosis when ER stress is prolonged. Therefore, we aimed to investigate whether prolonged ER stress is induced by exogenous HOCI and its underlying mechanisms.

**Methods** Apoptosis were determined by Annexin V-FITC double staining assay and TUNEL assay. The phosphorylation of Ire1a and PERK, expression of XBP1, GRP78 and CHOP were measured by western-blot. And the nuclear translocation of ATF6 was studied by immunofluorescence.

**Results** The results showed that HOCI induced endothelial cell apoptosis and ER stress, characterised by the activation of ER stress sensors (phosphorylation of Ire1a and PERK, nuclear translocation of ATF6) and of their subsequent pathways (eukaryotic initiation factor 2a phosphorylation, expression of XBP1 and KDEL chaperones GRP78). Otherwise, exogenous HOCI can also induce apoptosis protein-CHOP and caspase-3 expression. All these effects of HOCI were inhibited by GRF78 gene silencing. The caspase-3 inhibitor DEVD-CHO significantly inhibited HOCI-induced endothelial cell apoptosis, but had no effect on ER stress sensors and CHOP generation.

**Conclusions** Collectively, these findings suggest for the first time that ER stress plays a critical role in HOCI-induced endothelial cell apoptosis.

**GW23-e1215**

**ALTERATIONS OF THE CALRETICULIN-STAT3 PATHWAY ASSOCIATES WITH MITOCHONDRIA DAMAGE IN A RAT MODEL OF DILATED CARDIOMYOPATHY**

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**Objectives** To study the calreticulin-signal transducer and activator of transcription 3 (STAT3) signalling pathway and its effect on mitochondria damage in the progress of dilated cardiomyopathy (DCM).

**Methods** Thirty-five male Sprague-Dawley rats were divided into three groups including the untreated group, a control group treated orally with 0.15% carboxy methylcellulose-Na solution and a model group treated with suspension of furazolidone (700 ppm) dissolved in 0.15% carboxy methylcellulose-Na for 30 weeks. The cardiac function and structure were measured using the echocardiographic and hemodynamic studies and paraffin-embedded sections staining respectively. The signal molecules involved in the calreticulin-STAT3 pathway were investigated by real-time quantitative polymerase chain reaction and western-blot. At last the cardiac mitochondria structure and function were detected.

**Results** Compared with the control and untreated groups, the rats in the model group had enlarged left ventricular dimensions, and reduced systolic and diastolic function. Focal and diffuse areas of myocardial degeneration and interstitium fibrosis were present in the rat hearts of model group. Calreticulin mRNA expression was 3-fold higher in the model group than that in control group, and the protein level of calreticulin was also significantly higher than that in the control and untreated groups (p<0.05). The protein expression of STAT3 and p-STAT3 in the whole myocardium and cardiac mitochondria were both significantly down-regulated in the model group (p<0.05). The gene and protein levels of manganese superoxide dismutase (MnSOD), downstream to STAT3, were also significantly decreased in the model group (p<0.05). Under electron microscopic observation, the cardiac mitochondria in the model group were swelling with fractured or dissolved cristae. The mitochondrial membrane potential level of the isolated fresh cardiac mitochondria, and the enzyme activities of cytochrome c oxidase and succinate dehydrogenase in the model group were both significantly decreased as compared with control and untreated groups (p<0.05).

**Conclusions** A rat model of DCM induced by furazolidone was successfully established. It might be that furazolidone-induced DCM is due to the alterations of calreticulin-STAT3 pathway. Down-regulated expression and activity of STAT3 can not only promote mitochondrial membrane permeability pore to open directly, but also induce mitochondrial damage indirectly through inhibiting the expression of MnSOD.
**PROTECTIVE EFFECTS OF ERYTHROPOIETIN ON CARDIAC FUNCTION IN DIABETIC RATS**

Dai Qiming, Zhang Shufeng, Lu Jing, Dai Qiming. Cardiology department, Zhongda Hospital, Southeast University; 2Department, Zhongda Hospital, Southeast University

**Objectives** To investigate the protective effects of erythropoietin on cardiac function of diabetic rats and its mechanism

**Methods** Forty-five male SD rats (180–200 g) were randomly divided into three groups: normal control (CON, n=15), STZ-induced diabetic rats (DM, n=15), and diabetic rats treated with EPO (DM+EPO, n=15). Diabetic rat model was established by intraperitoneal injection of STZ. These rats were fed under standard conditions. The rats in DM+EPO group received EPO (1000 U/kg per injection) at 7-day intervals after diabetic model was established. Rats in CON group and DM group received the same dose of saline. At the beginning of experiment and the end of the 12th week blood samples of rats were collected to analyse red blood cell count and fasting blood glucose. Echocardiography was performed to get the parameters of cardiac function in rats and blood was collected to analyse the count of endothelial progenitor cells (EPCs) at the end of the 12th week. CTGF protein expression in myocardial tissue was detected by immunohistochemical method, while VEGF protein and VEGF mRNA expressions were examined by realtime RT-PCR and western blot respectively.

**Results** (1) Red blood cell count and fasting blood glucose: The average red blood cell count of the CON group, DM group and DM+EPO group at the end of the 12th week was (8.16±0.37)×10¹²/l, (4.93±0.47)×10¹²/l and (8.63±0.47)×10¹²/l respectively. No significant difference was found between DM+EPO group and CON group, as well as between CON group and DM group (p > 0.05). But DM+EPO group was significantly higher than diabetic group (p<0.01). The average fasting blood glucose of the three groups was 4.13±0.43 mmol/l, 20.27±1.20 mmol/l and 21.37±1.53 mmol/l respectively. No significant difference was found in fasting blood glucose between DM+EPO group and DM group (p > 0.05), but the two groups were both higher than CON group (p<0.01). In DM+EPO group the fasting blood glucose at the beginning and the 12th week had no difference (p >> 0.05). (2) Index of cardiac function measured by echocardiography: The average of left ventricular ejection fraction (LVEF) of three groups was 79.4±8.12%, 65.7±5.49% and 75.6±4.87% respectively. LVEF of DM group was significantly lower than CON group, while DM+EPO group was significantly higher than DM group (p<0.01). But the difference between DM+EPO group and CON group was not significant (p>0.05). (3) The count of EPCs (%) in blood: The count of EPCs in blood for the DM+EPO group was much higher than CON group and DM group (51.75±1.91 vs 7.65±0.90 or 2.71±0.74, p<0.01), while DM group was lower than CON group (p>0.05). (4) The expression of CTGF in myocardial tissue: Mild positive staining with VEGF was observed in CON group, while VEGF staining was strongly seen in DM group and moderate in DM+EPO group. (5) The expression of VEGF mRNA: The expression of VEGF mRNA for DM+EPO group was much higher than CON group and DM group (0.81±0.031 vs 0.65±0.040 or 0.29±0.053, p<0.01), and DM group was lower than CON group (p<0.01). (6) The expression of VEGF protein: The expression of VEGF protein for the DM+EPO group was much higher than CON group and DM group (0.59±0.026 vs 0.40±0.032 or 0.25±0.024, p<0.01), while DM group was lower than CON group (p<0.01).

**Conclusions** (1) EPO can improve the cardiac function of diabetic rats. (2) EPO can increase the count of EPCs in blood, upregulate the expression of VEGF and downregulate the expression of CTGF of myocardial tissue in diabetic rats. 3. EPO can protect cardiac function in diabetic rats probably via improving microvascular function and inhibiting fibrosis of myocardial tissue.

**ABSTRACTS**

**PROTECTIVE EFFECTS OF ERYTHROPOIETIN ON CARDIAC FUNCTION IN DIABETIC RATS**

Dai Qiming, Zhang Shufeng, Lu Jing, Dai Qiming. Cardiology department, Zhongda Hospital, Southeast University; 2Department, Zhongda Hospital, Southeast University

**Objectives** To investigate the protective effects of erythropoietin on cardiac function of diabetic rats and its mechanism

**Methods** Forty-five male SD rats (180–200 g) were randomly divided into three groups: normal control (CON, n=15), STZ-induced diabetic rats (DM, n=15), and diabetic rats treated with EPO (DM+EPO, n=15). Diabetic rat model was established by intraperitoneal injection of STZ. These rats were fed under standard conditions. The rats in DM+EPO group received EPO (1000 U/kg per injection) at 7-day intervals after diabetic model was established. Rats in CON group and DM group received the same dose of saline. At the beginning of experiment and the end of the 12th week blood samples of rats were collected to analyse red blood cell count and fasting blood glucose. Echocardiography was performed to get the parameters of cardiac function in rats and blood was collected to analyse the count of endothelial progenitor cells (EPCs) at the end of the 12th week. CTGF protein expression in myocardial tissue was detected by immunohistochemical method, while VEGF protein and VEGF mRNA expressions were examined by realtime RT-PCR and western blot respectively.

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**Conclusions** (1) EPO can improve the cardiac function of diabetic rats. (2) EPO can increase the count of EPCs in blood, upregulate the expression of VEGF and downregulate the expression of CTGF of myocardial tissue in diabetic rats. 3. EPO can protect cardiac function in diabetic rats probably via improving microvascular function and inhibiting fibrosis of myocardial tissue.
**ABSTRACTS**

**GW23-e1731**

**THE ENDOPLASMIC RETICULUM STRESS-JNK PATHWAY-MEDICATED APOPTOSIS IN MACROPHAGES CONTRIBUTES TO THE INSTABILITY OF Atherosclerotic PLAQUES INDUCED BY COLD STRESS**

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**Objectives**

To elucidate whether and how the endoplasmic reticulum (ER) stress-JNK pathway in macrophages is involved in the instability of atherosclerotic plaques induced by cold stress.

**Methods**

Forty male New Zealand white rabbits fed on high-fat diet for 2 weeks following by balloon injury of abdominal aorta were randomly divided into two groups: Cold-stress group and control group. Cold-stress group were exposed to cold (4°C) for 1 h per day for 20 weeks. The animals were sacrificed and then pathological changes of atherosclerotic plaques were evaluated.

**Results**

In a mouse model of acute doxorubicin-induced cardiotoxicity, cardiomyocyte-specific deletion of Rac1 inhibited NADPH oxidase activation and ROS production, prevented cardiac cell death and improved myocardial function in Rac1 knockout mice. Therapeutic administration of a specific Rac1 inhibitor NSC23766 achieved similar cardioprotective effects of Rac1 inhibition in doxorubicin-stimulated mice. In vitro studies using rat cardiomyoblasts H9c2 cells and neonatal mouse cardiomyocytes demonstrated that Rac1 inhibition attenuated apoptosis as determined by decreases in caspase-3 activity and DNA fragmentation in response to doxorubicin, which correlated with a reduction of ROS production and down-regulation of p53 acetylation and histone H2AX phosphorylation. Doxorubicin also inhibited the activity of classical histone deacetylases (HDAC), which was preserved by Rac1 inhibition. Interestingly, scavenging ROS mitigated apoptosis but did not change HDAC activity and p53 acetylation stimulated by doxorubicin, suggesting both ROS dependent and independent pathways are involved in Rac1-mediated cardiotoxicity. Furthermore, HDAC inhibitor trichostatin A enhanced apoptosis, p53 acetylation and H2AX phosphorylation in doxorubicin-treated cardiomyocytes.

**Conclusions**

Rac1 signalling contributes to doxorubicin-induced cardiotoxicity through both ROS dependent mechanism and ROS independent HDAC/p53 signalling in cardiomyocytes. Thus, inhibition of Rac1 may be a useful therapy for doxorubicin-induced cardiotoxicity.

**GW23-e1800**

**NOVEL MUTATIONS ON SCN5A CAUSED FATAL ARRHYTHMIA SYNDROME IN CHINESE**

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**Objectives**

SCN5A is encoding human sodium channel protein Nav1.5. Mutations on SCN5A have been found to induce multiple fatal arrhythmia syndromes, such as Long QT syndrome (LQTS), atrioventricular block (AVB) and Brugada syndrome. This study aimed to explore the pathogenic spectrum, characteristics and therapeutic outcomes of the syndromes caused by mutations on SCN5A.

**Methods**

One LQT3 kindred and an AVB kindred from the Chinese National Channelopathy Registry Study were investigated. Blood samples and clinical data were obtained under written consents. Mutational screening of SCN5A gene was performed via PCR and direct DNA sequence analysis. LQTS or AVB phenotype and therapeutic outcomes were evaluated for all probands and family members. Genotype-phenotype evaluation was also performed for family members. Mutational analyses were based on NCBI standardized mRNA sequence (SCN5A: NM_198056.2).

**Results**

The LQTS proband was a 1-year-old girl (test-tube baby). She had her first syncope at 9-month-old in night sleep. Afterwards several episodes of syncope occurred, often accompanied by Torsades de Pointes (Tdp) and ventricular fibrillation. ECG showed a maximum QTc of 690ms, while no abnormality was found on ECG of her parents. Gene screening of SCN5A identified a novel mutation F1473S (4418 T>C) on the proband, but this mutation was not detected on the parents, indicating a de novo mutation. Medication with propranolol (2.5 mg/kg/d) alone did not improve the symptoms. Additional use of mexiletine (12.5 mg/kg/d) showed some improvement, but syncope still occurred now and then. Then the dosage was adjusted to propranolol (2.5 mg/kg/d) and mexiletine (15 mg/kg/d). The girl died at 23-month-old, though the external defibrillator was used at home.

The AVB proband is a 57-year-old male. He showed symptoms of bradycardia, short of breath and even inability to lie down. ECG indicated complete right bundle branch block (RBBB) and
left anterior fascicular block. He has received pacemaker implantation in March of 2011 and no symptoms occurred since then. A novel mutation F919L (2757C>A) on SCN5A was found. No AVB related symptoms were found on his family members, except for RBBB showed in the ECG of his son and brother. Gene screening detected the same mutation in both persons. To note, the proband’s father had sudden death at age of 57, but no DNA sample is available to determine his genotype.

**Conclusions** The present study revealed two novel mutations, F1473S and F919L on SCN5A, which have not been reported. The two novel mutations induced distinct but equally lethal arrhythmia syndromes, LQTS and AVB, respectively. In consider of the reports in western countries of relatively severe LQTS-causing mutation F1473C (4418 T>G) on SCN5A, we may also conclude that the site SCN5A1473 is a mutational “hot spot”, which characterises an early onset and severe phenotype of LQT3.

**GW23-e1618** THE MECHANISM BY WHICH ERS INHIBITION LEADS TO CARDIOPROTECTION

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**Objectives** Purpose While it is well known that endoplasmic reticulum stress (ERS) plays an important role in myocardial ischaemia/reperfusion injury and inhibition of ERS leads to cardioprotection against I/R injury, the precise mechanism by which inhibition of ERS induces cardioprotection remains unclear. Inhibition of mitochondrial permeability transition pore (mPTP) opening is critical for the prevention of reperfusion injury and that ERS is implicated in the mechanism underlying reperfusion injury and induces mitochondrial stress. The purpose of this study was to determine if inhibition of ERS can prevent the mPTP opening and to explore the signalling mechanism whereby ERS inhibition leads to the protection against the mPTP opening.

**Methods** All experiments were conducted using H9c2 cells. First, we tested if TUDCA, an inhibitor of ERS, could modulate the mPTP opening. To detect the mPTP opening, cells were loaded with the mitochondrial specific fluorescent dye TMRE and imaged with confocal microscopy. After treatments with TUDCA at different concentrations, cells were exposed to 800 μM H2O2 to induce the mPTP opening. To determine the roles of the PI3K/Akt and PKG pathways in the action of TUDCA, cells were treated with the PI3K inhibitor LY294002 and the PKG inhibitor KT5823 prior to the application of TUDCA. To define the signalling mechanism responsible for the protective effect of TUDCA, phosphorylation status of Akt, VASP, and GSK-3β were measured with Western blotting. Finally, to corroborate the protective effect of TUDCA, subcellular structures and cell viability were detected with transmission electron microscopy (TEM) and flow cytometry, respectively.

**Results**

1. Exposure of cells to 800 μM H2O2 for 20 min caused a marked decrease in TMRE fluorescence, indicating mPTP opening by oxidative stress. Compared to the control, 20, 50, and 40 μM TUDCA prevented the loss of TMRE fluorescence (68.2±4.8%, 75.5±2.7%, 66.6±2.4%), pointing to that inhibition of ERS leads to the prevention of mPTP opening.

2. The effect of TUDCA on TMRE fluorescence was inhibited by LY294002 and KT5823 (fluorescence intensity decreased to 60.7±4.6% and 53.2±4.2%), implying that the PI3K/Akt and PKG signalling pathways may mediate the action of TUDCA.

3. TUDCA at different concentrations significantly increased GSK-3β phosphorylation at Ser9 with the pick at 50 μM (285.6±9.9%). The expression level of ERS marker GRP78 was also most prominent with 30 μM TUDCA (57.3±5.7%).

4. TUDCA-induced increases in Akt and GSK-3β phosphorylation were inhibited by LY294002 (63.6±5.7%, 84.1±3.5%), whereas KT5823 could suppress phosphorylation of VASP and GSK-3β by TUDCA (50.6±4.0%, 78.7±3.9%).

5. Experiments with TEM revealed that TUDCA prevented H2O2-induced swelling of ER and mitochondrial damages.

6. Studies with flow cytometry showed that TUDCA given at reperfusion but not during ischaemia improved cell viability in cells subjected to ischaemia followed by reperfusion.

**Conclusions**

1. Inhibition of ERS leads to the prevention of mPTP opening and reperfusion injury.

2. Inhibition of ERS results in the modulation of mPTP opening through inactivation of GSK-3β.

3. The PI3K/Akt and PKG pathways may mediate inactivation of GSK-3β.

**GW23-e2121** A PROTECTIVE FUNCTION OF THE NRF2 DURING HYPOXIA PRECONDITIONING INCREASING CELL SURVIVAL AND THE THERAPEUTIC POTENTIAL OF ENDOTHELIAL PROGENITOR CELLS

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**Objectives** Accumulating evidence indicates that transient hypoxic preconditioning improves resistance to severe hypoxia and enhances the therapeutic potential of endothelial progenitor cells (EPCs) in cell-based therapies for vascular repair and ischaemic disease; however, the mechanisms underlying this process remain unclear. Nrf2 (nuclear factor E2-related factor 2) is a key transcription regulator that orchestrates protective cellular responses to oxidative stress. The objective of this study was to test the hypothesis that hypoxic preconditioning activates Nrf2 and the expression of its target gene, resulting in improved biological function and resistance to hypoxia.

**Methods** We observed that exposure to hypoxia following siRNA-mediated knockdown of Nrf2 resulted in an increase in apoptosis, the inhibition of proliferation and impaired angiogenesis in vitro. Furthermore, hypoxic conditions activated Nrf2 via the PI3K/Akt signalling pathway, which resulted in the nuclear translocation of Nrf2 from the cytoplasm and a subsequent increase in the expression of one of the most important Nrf2 target genes: heme oxygenase 1 (HO-1).

**Results** We observed that exposure to hypoxia following siRNA-mediated knockdown of Nrf2 resulted in an increase in apoptosis, the inhibition of proliferation and impaired angiogenesis in vitro. Furthermore, hypoxic conditions activated Nrf2 via the PI3K/Akt signalling pathway, which resulted in the nuclear translocation of Nrf2 from the cytoplasm and a subsequent increase in the expression of one of the most important Nrf2 target genes: heme oxygenase 1 (HO-1).

**Conclusions** EPCs exhibit resistance to hypoxia and improved therapeutic potential during hypoxia preconditioning that is mediated by the PI3K/Akt-Nrf2-HO-1 signalling pathway.
**GW23-e2454**  THE EFFECTS AND MECHANISM OF RESVERATROL ATTENUATING OXIDATIVE STRESS IN BALLOON INJURED RAT CAROTID ARTERY

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**Objectives** The neointimal hyperplasia is the common pathological basis of several vascular diseases, including atherosclerosis and restenosis. In recent years, a large number of studies have found that the oxidative stress after artery injury take a critical role in pathogenesis of intimal hyperplasia. Resveratrol as a polyphenols has showed significant antioxidant effect in a variety of diseases. However, it is unclear whether resveratrol participate in modulating vascular restenosis induced by oxidative injury after balloon injury.

**Methods** The male Sprague-Dawley rats were established with balloon-injury model in vivo, and vascular smooth muscle cells (VSMCs) isolated from thoracic artery were stimulated with angiotensin II (Ang II) in vitro.

**Results** Compared to model group, the neointimal/medial area (I/M) and the restenosis rate were both decreased significantly by 1mg/kg/d resveratrol intraperitoneal injection either 7 days or 14 days after surgery (I/M 7d:0.47±0.04 vs 0.13±0.02, p<0.05; 14d:0.25±0.05 vs 0.08±0.03, p<0.05; Restenosis Rate 7d:0.08±0.03 vs 0.07±0.05, p<0.05; 14d:0.09±0.03 vs 0.41±0.13, p<0.05). Moreover, the level of 8-iso-Prostaglandin F2a in serum was upregulated after 7 days (7d:0.08±0.03 vs 0.24±0.07, p<0.05,14d:0.09±0.03 vs 0.41±0.13, p<0.05). Western blot results revealed that resveratrol could suppress the ERK phosphorylation and NF-κB transcriptional activity (both p<0.05), with no effects on NF-κB p65 translocation and IkB degradation (both p>0.05).

**Conclusions** Resveratrol could significantly suppressed neointimal hyperplasia after balloon injury though inhibition of oxidative stress and inflammation.

**GW23-e2458**  MAGNETIC RESONANCE IMAGING WITH SUPERPARAMAGNETIC IRON OXIDE FAILS TO TRACK THE LONG-TERM FATE OF MESENCHYMAL STEM CELLS AFTER TRANSPLANTATION IN THE HEART

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**Objectives** Currently, magnetic resonance imaging (MRI) are adopted to evaluate the outcomes of cardiac cell therapy such as on left ventricular (LV) contractile function and LV remodelling. While the ability of MRI for in vivo stem cell tracking remains controversial. Here we tested the hypothesis that MRI can track the long-term fate of the superparamagnetic iron oxide (SPIO)- nanoparticles labelled mesenchymal stem cells (MSCs) following intra-myocardially injection in the experimental acute myocardial infarction in rats.

**Methods** Myocardial infarction was experimentally induced in adult female Lewis rats by permanent ligation of the left anterior descending coronary artery. MSCs (2×10^6) from male Lewis rats doubly labelled with SPIO and 4-6-diamidino-2-phenylindole dihydrochloride (DAPI) were injected into the peri-infarct area 2 weeks after myocardial infarction. The control group received cell-free media injection. In vivo serial MRI was performed using a 7.0 T horizontal-bore animal scanner (Varian, Palo Alto, California, USA) supplied with an actively-shielded gradient of 400 mT/m and a 70-mm transmit/receive birdcage radio frequency (RF) coil, at 24 h before cell delivery (baseline), 3 days, 1, 2, and 4 weeks after cell delivery, respectively. Electrocardiography-gated T2*WI gradient echo sequence and cine MRI were performed for in vivo cell tracking and assessing cardiac function using left ventricular ejection fraction (LVEF), left ventricular end-diastolic volume (LVEDV); left ventricular end-systolic volume (LVESV), respectively. The survival, migration and apoptosis of grafted MSCs were assessed by polymerase chain reaction analysis for the rat Y-chromosome-specific SRY gene, histopathological examination and terminal deoxynucleotidyl transferase dUTP nick end labelling (TUNEL) staining, respectively.

**Results** Serial follow-up MRI demonstrated large persistent intramyocardial signal-voids as large black spots representing SPIO during the follow-up of 4 weeks, and MSCs moderate the left ventricular dilatation and dysfunction compared with controls at 3 days, 1 and 2 weeks after cell transplantation, respectively. The TUNEL analysis confirmed that MSCs engrafted in infarcted hearts underwent apoptosis. The histopathological studies (at 2, 4 weeks) revealed that the site of cell injection was infiltrated by inflammatory cells and the iron-positive cells were macrophages identified by CD68 staining, but very few or no DAPI-positive stem cells in the animals after cells transplantation, respectively. The presence of engrafted cells was confirmed by real-time polymerase chain reaction on postmortem specimens, which showed that the expression of Y-chromosome-specific SRY gene of MSCs from male donors in infarcted hearts of female recipients was consistent with the results of the histopathological assessment.

**Conclusions** MRI enables in vivo evaluation of the long-term therapeutic potential of MSCs for myocardial infarction, while does not reliably track the long-term fate of SPIO-labelled MSCs engraftment in the heart.

**GW23-e2387**  INHIBITORS OF MiRNA-30 FAMILY PROTECTED THE HYPOXIA-INDUCED INJURY ON CARDIAC MYOCYTES VIA INCREASING THE EXPRESSION OF CSE

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**Objectives** Recently, miRNAs and H2S have been reported to be cardioprotective during myocardial infarction injury. However, there is little evidence indicating a functional role for miRNA in regulating the generation of H2S. Our study was designed to determine
which miRNAs are able to protect myocardial ischaemic injury by regulating the expression of CSE (Cystathionine gamma-lyase, a major H$_2$S-producing enzyme in the cardiovascular system).

**Methods** Using real time PCR, we found that the miR-30 family, which includes 5 closely related miRNAs were highly expressed in the non-infarct and border zone regions after 48 h of ischaemia injury. Computational prediction implied CSE as potential targets for miR-30 family, and luciferase assay assay identified that CSE was a direct target of miR-30 family. Overexpression of miR-30 family by transfecting miRNA mimics for 48h in cultured neonatal rat cardiomyocytes demonstrated an inhibition of the expression of CSE at both mRNA and protein levels, and also a reduction of the H$_2$S generation. In contrast, downregulation of miR-30 family by antisense inhibitors increased the level of CSE mRNA and protein and the H$_2$S concentration. MTT results show that hypoxia-induced cardiac cell death was increased by miR-30 family mimics and was decreased by miR-30 family inhibitors.

**Results** Using real time PCR, we found that the miR-30 family, which includes 5 closely related miRNAs were highly expressed in the non-infarct and border zone regions after 48 h of ischaemia injury. Computational prediction implied CSE as potential targets for miR-30 family, and luciferase assay assay identified that CSE was a direct target of miR-30 family. Overexpression of miR-30 family by transfecting miRNA mimics for 48h in cultured neonatal rat cardiomyocytes demonstrated an inhibition of the expression of CSE at both mRNA and protein levels, and also a reduction of the H$_2$S generation. In contrast, downregulation of miR-30 family by antisense inhibitors increased the level of CSE mRNA and protein and the H$_2$S concentration. MTT results show that hypoxia-induced cardiac cell death was increased by miR-30 family mimics and was decreased by miR-30 family inhibitors.

**Conclusions** MiRNA-30 family regulated the generation of H$_2$S via its target gene CSE, their protective effect against the hypoxia-induced injury on cardiomyocytes may open a new therapeutic avenue for the treatment of myocardial infarction injury.

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**THE CROSSTALK BETWEEN ERK1/2 AND STAT3 IN THE REGULATION OF CAR EXPRESSION DURING CVB3 INFECTION IN CARDIOMYOCYTE.**

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**Objectives** We performed a novel analysis of cardiac expression of receptors for several adenovirus serotypes with a focus on expression of CAR, as adenoviruses targeting receptor has been used in various applications, that more than the viral receptor which is significantly induced in the heart tissue of CVB3 infected and considered to be the dominant aetiology of viral myocarditis.

**Methods** We treated cardiomyocytes with culture medium in the uninfected or infected of CVB3 (MOI=100). The lentivector system derived from HIV-1 was used to express short hairpin RNAs (shRNA) directed against STAT3 and ERK1/2 activation was blocked with U0126, an ERK1/2 inhibitor. Western blot was used to observe the level of CAR, ERK and STAT3. The degrees of cells injury were judged by LDH levels in cells supernatant.

**Results** Up-regulation activities of ERK1/2 after CVB3 infected with cardiomyocytes, accompanied by positive correlation of the expression of CAR. Treatment of cardiomyocytes with Pharmacological inhibition of ERK1/2 phosphorylation with U0126 resulted in a dramatic increase in the expression of CAR. U0126 induced the JNK/STAT3 pathway activity to prevent cells from injury. Lentivector-based short hairpin RNAs provide efficient and stable knock down of STAT3. Treatment of cardiomyocytes with shERK resulted in ERK1/2 phosphorylation and a decrease in the expression of CAR accompanied by the elevation of LDH levels in infected with CVB3 cells.

**Conclusions** We investigated the effect of signalling through the Raf-MEK-ERK1/2 pathway on CAR expression in cardiac myocytes that are potential targets for adenovirus-based therapies. Our findings in modulation of CAR expression, may lead to new strategies in the gene therapy of DCM.

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**EXENATIDE ATTENUATE H9C2 CELLS DAMAGES INDUCED BY HYPOXIA/REOXYGENATION VIA P38MAPK γ NOT P38MAPK α AND β**

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**Objectives** The glucagon-like peptide-1 analogue Exenatide (Ex-4) acts as a protective factor in the cardiomyocytes damages induced by hypoxia/reoxygenation (H/R) treatment, and Ex-4 could enhance the glucose uptake of cardiomyocytes. But the relationship between those two effects was unclear. We carried out this experiment to detect Ex-4 effects on H9c2 cells damages induced by H/R, and to clarify its correlation with glucose uptake, and explore the underlying signal transduction passway.

**Methods** H9c2 cells were cultures at a series of concentrations (50 nM, 100 nM, 200 nM) of Ex-4, and then subjected to H/R treatment (10/5 h). The cell vitality and the glucose concentration in the medium were measured with cell counting kit-8 (CCK-8) and glometers. H9c2 cells were divided into four groups: control group (NC group), Ex-4 group, Ex-4 and p38MAPK inhibitor SB203580 group (Ex-4+SB203580 group), Ex-4 and p38MAPK inhibitor BIRB796 group (Ex-4+BIRB796 group). The cells were processing with 2-NBDG, Ex-4 and inhibitors for 8 h before H/R treatment. Intracellular rate of 2-NBDG was used as a fluorescent probe for direct glucose uptake measurement. Western blot was used to analyse p38MAPK subunits proteins expression.

**Results** The most suitable Ex-4 concentration and preincubation period for H9c2cells were 200 nM and 45 min. Cells treated with Ex-4 better survived with following H/R treatment and the glucose levels decreased more than that without Ex-4incubation. The fluorescence intensity of Ex-4 group was higher significantly than the NC group (p<0.05). However, the function of Ex-4 was abolished by p38MAPK inhibitor BIRB796 at a very low concentration of 0.5 μmol/l (fluorescence intensity: 415.9±57.9 vs 363.2±66.8, n=5, p>0.05) and the glucose uptake of Ex-4 groups was also attenuated by BIRB796 (516.3±52.8 au vs 386.8±30.2 au, n=5, p<0.05). While, the p38MAPK α and β inhibitor SB203580 showed no inhibition of Exenatide effects on H9c2 (405.7±45.6 vs. 415.9±57.9, n=5, p>0.05) and the glucose uptake of Ex-4 groups was also attenuated by BIRB796 (516.3±52.8 au vs 386.8±30.2 au, n=5, p>0.05). Western blot proved that p38MAPKβ expression decreased in Ex-4+ BIRB796 group (0.62±0.03 vs 0.83±0.04, n=5, p<0.05), but not in Ex-4+SB203580 group (0.79±0.03 vs. 0.83±0.04, n=5, p>0.05), when compared with Ex-4 group.

**Conclusions** Ex-4 could attenuate H9c2 cells damages induced by H/R and promote glucose uptake. The p38MAPK pathway was involved in cell signal transduction, but it is p38MAPK α and β mediate Ex-4’s effects.
THE STUDY OF CAROTID ATHEROSCLEROSIS PLAQUE BIOMECHANICS PATIENTS WITH METABOLIC SYNDROME USING MULTIPLE TRACKING TECHNIQUES

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Methods 120 patients with metabolic syndrome (MS) were undergone the high frequency ultrasound scanning in this study. Dynamic imaging was acquired from the short axis views in all subjects. All above images were stored for off-line analysis with dedicated MTT workstation and all mechanical parameters were collected, including the peak velocity, strain and strain rate of the intima of plaque and without plaque, the cap and shoulder of plaque on the corresponding carotid. The above parameters at different points of carotid intima were compared and studied.

Results The systolic radial velocity, rotation rate, circumferential strain and strain rate on the corresponding vascular of plaque and without plaque, the cupular part of the fibrous cap, and the shoulder of plaque using Multiple Tracking Techniques (MTT), and evaluate of carotid atherosclerosis plaque biomechanics patients with coronary artery disease.

Conclusions The MTT technique could detect the elasticity of blood vessel wall, sclerosis and the mechanism asynchrony of the corresponding vascular of plaque and without plaque, the cupular part of the fibrous cap, and the shoulder of plaque using Multiple Tracking Techniques (MTT), and evaluate of carotid atherosclerosis plaque biomechanics patients with coronary artery disease.

TRANSFORMING GROWTH FACTOR-β2 RELEASED BY MESENCHYAL STEM CELLS PRECONDITIONED WITH HIGH DENSITY LIPOPROTEIN FROM HYPOXIA

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Objectives The effect of high density lipoprotein (HDL) on the secreotene of mesenchymal stem cells (MSCs) has not been well elucidated yet. The aim of the study is to examine the hypothesis that preconditioning with HDL promotes MSCs secreotene, subsequently protecting cardiomycocytes from hypoxia.

Methods MSCs derived from bone marrow of rats were preconditioned with HDL in various concentrations or for different periods. Afterwards, the mRNA of some soluble factors (including VEGF, bFGF, HGF, TGF-β2) in MSCs was analysed by real-time PCR, and the levels of above factors in supernatant were analysed by ELISA. Cardiomycocytes of neonatal rats were exposed to hypoxia for 12 h, incubated in culture medium which were respectively added with the supernatant filtered from MSCs and HDL cultured system (MSCs+HDL), from MSCs alone cultured medium (MSCs), or the same terminal concentration of HDL (HDL) or PBS (Control). Apoptosis of cardiomycocytes was evaluated by TUNEL assay and western-blot. RNA interference was administrated to confirm the effect of soluble factors on the cardiomycocytes (siRNA) apoptosis, in which flow cytometry was addressed to evaluate the apoptosis rate.

Results When MSCs were exposed to HDL, the expression of TGF-β2, both mRNA level in MSCs and protein level in supernatant, increased significantly in a time- and concentration-dependent manner. Group (MSCs+HDL) exhibited remarkable lower apoptosis rate compared with Group (Control), Group (HDL), Group (MSCs) (TUNEL: (10.23±5.68)% vs (28.36±4.98)%, vs (16.38±5.38)%, vs (17.82±6.24)%, p value all<0.05; bcl-2/hox: (0.84±0.16) vs (0.156±0.03), or (0.411±0.10), or (0.346±0.08), p value all<0.05). After knocked down the TGF-β2 gene, Group (siRNA) showed a significantly higher apoptosis rate compared with Group (MSCs+HDL) (10.28±1.33)% vs (5.34±0.67)%, p<0.05.

Conclusions TGF-β2 released by mesenchymal stem cells preconditioned with high density lipoprotein protects cardiomycocytes from injury of hypoxia.
pressure overload. The possible mechanisms may involve inhibition of angiotensin II type 1 receptor and activation of ErbB receptors.

GW23-e2653  THE MACROPHAGE MIF EXPRESSION ON VASCULAR ENDOTHELIAL CELLS OF ATHEROSCLEROTIC PIGS AND ITS DOWNREGULATION WITH LONG-TERM ENHANCED EXTERNAL COUNTERPULSATION

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Objectives Mechanisms underlying the beneficial effect of Enhanced External Counterpulsation (EECP) in atherosclerotic diseases are not well defined. Since Migration Inhibitory Factor (MIF), as a novel pro-inflammatory and immuno-regulatory factor, has recently been believed to play a pivotal role in the pathogenesis of atherosclerosis, we hypothesised that long-term EECP could down-regulate the expression of MIF in vascular endothelial cells (VECs) of atherosclerotic lesions, contributing to its clinical outcomes. We studied this hypothesis in a porcine model of atherosclerosis.

Methods Eighteen twenty-day-old male domestic pigs were randomly assigned into three groups: the normal control group (normal group, n=6), the hypercholesterolemic control group (HC group, n=6) and the hypercholesterolemic+EECP group (EECP group, n=6). Pigs in normal group were fed with normal diet, while the pigs in the other two groups were fed with cholesterol-rich diet in order to induce atherosclerosis. Six pigs in EECP group were anaesthetized by intramuscular injection of 846 mixture and intravenous infusion of pentobarbital sodium. The EECP procedures were performed on them for 2 h every 2 days with 0.055 MPa/cm² pressure, summed total 36 h. After the end of EECP, all the pigs were sacrificed by injecting overdose of 10% potassium chloride into the heart. For each animal, the thoracic aorta was isolated for harvesting VECs with collagenase. One half of the harvested VECs were fixed with 4% paraformaldehyde and further embedded with paraffin. The remaining VECs were prepared for extracting their total mRNA. Immunocytochemical staining for MIF was performed on parafin-embedded VECs, while RT-PCR was applied for detecting the transcriptional expression of MIF, respectively.

Results The staining-positive rate of MIF of aortic VECs in EECP group was much lower than that in HC group ((211±14)% vs (358±26)%, p<0.05), but still higher than that in normal group significantly ((211±14)% vs (168±22)%, p<0.05). In consistence with the result of immunocytochemical staining analysis, the relative ratio of RT-PCR products of MIF were lower in EECP group than that in HC group ((1.26±0.15) vs (1.89±0.22), p<0.05), but still higher than that in normal group significantly ((1.26±0.15) vs (0.65±0.11), p<0.05). The immunocytochemical expression of MIF correlated positively to its relative ratio of RT-PCR products (r=0.662, p<0.05).

Conclusions MIF in VECs may play an important role in atherogenesis. Transcriptional downregulation of MIF in VECs may be one of the molecular mechanisms contributing to the clinical outcomes following EECP preformation.

GW23-e2682  IMPROVEMENT OF CARDIAC FUNCTION BY TRANPLANTED MESENCHYMAL STEM CELLS WITH DOWN-REGULATION OF PHD2 VIA PARACRINE FACTORS IN MYOCARDIAL INFARCTED MICE

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Objectives Transplantation of stem cell has emerged as a promising therapeutic intervention for cardiac repair. However, the survival rate of post-transplanted stem cell in the harsh microenvironment is very low. Prolyl hydroxylase domain protein 2 (PHD2) is an important cellular oxygen sensing molecules, which regulate the cellular response to the alteration of oxygen concentration. Knockout of PHD2 is protective for ischaemic cardiac disease. We hypothesise that transplantation of ADSCs genetically modified with PHD2 inhibition promotes the stem cell survival and cardiac function. In present study, adipose derived mesenchymal stem cell

GW23-e2682  EFFECTS OF WEDELOLACTONE ON THE PROTEIN EXPRESSION OF APOPTOSIS-ASSOCIATED BCL-2, BAX AND PARP (89KD) IN THE PRIMARY CULTURED RAT CARDIOMYOCYTES SUBJECTED TO ANOXIA/REOXGENATION INJURY

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Objectives To study the effects of Wedelolactone (Wed) on the protein expression of apoptosis-associated Bcl-2, Bax and PARP (89KD) in the primary cultured rat cardiomyocytes subjected to anoxia/reoxygenation injury.

Methods The primary cultured neonatal rat cardiomyocytes were pretreated with Wed (0.2, 2, and 20 μmol/l) or Wed (2 μmol/l) for 1 h, respectively, and subjected to anoxia for 5 h and subsequently reoxygenation for 2 h. Cell viability, Creatine kinase (CK) and lactate dehydrogenase(LDH) activity in medium were measured. Terminal deoxynucleotidyl transferase d-UTP nick end labelling (TUNEL) staining was performed using an In Situ Cell Death Detection kit on rat cardiomyocytes. The expression of Bcl-2 and the apoptotic protein Bax and PARP (89KD) were detected by Western blotting.

Results Compared with that of the control group, the numbers of TUNEL-positive nuclei were significantly increased in cardiomyocytes after 3 h of anoxia and 2 h of reoxygenation. Bcl-2 protein in cardiomyocytes decreased significantly (p<0.01) and the expression of Bax protein and PARP (89KD) in cardiomyocytes increased significantly after reoxygenation. (p<0.01). Cell viability decreased obviously after anoxia/reoxygenation (p<0.05). Compared with that of the anoxia/reoxygenation group, pretreatment with different concentration Wed decreased LDH activity and increased the survival of the cells significantly (p<0.05). The expression of Bcl-2 protein in the Wed (2 μmol/l) groups increased significantly (p<0.05) and the expression of Bax protein decreased significantly (p<0.05).

Conclusions The Wed pre-treatment before ischaemia has antiapoptotic effects on neonatal rats myocardial cells undergoing anoxia/reoxygenation, the underlay mechanism might be attributed to the up-regulated the expression of Bcl-2 gene and the inhibited the expression of Bax and PARP(89KD) gene expression.

*These authors contributed equally to this work.

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Some miRNAs related to cardiac fibrosis have been reported. Eva van Rooij et al. firstly confirmed that miRNAs play important roles in the process of cardiac diseases, such as arrhythmia, atrial fibrillation, cardiac hypertrophy and so on.

**Methods** The model of AF was established by nicotine administration. The atrial fibroblasts isolated from healthy dogs were treated with nicotine. microRNAs level was quantified by Real-time PCR. The role of miRNAs on the expression and regulation of target genes were detected by Western blot and Luciferase assay. Collagen production was evaluated in vivo and in vitro.

**Results** Some miRNAs related to cardiac fibrosis have been reported. Eva van Rooij et al. firstly confirmed that microRNAs play an important role in cardiac fibrosis by revealing miR-29 as a regulator of cardiac fibrosis. Connective tissue growth factor (CTGF), a potent inducer of cardiac fibrosis, is reported to be regulated by two major cardiac microRNAs, miR-133 and miR-30. Other studies found that miR-24 attenuates cardiac fibrosis and improves heart function after myocardial infarction. Some evidence
showed that miR-21 contributes to cardiac fibrosis by regulating Spry1 and PTEN. Silencing of miR-21 in a mouse pressure-overload-induced disease model inhibits interstitial fibrosis. However, another group showed that miR-21 knockout and inhibition by 8-nucleotide antagonists fails to prevent ventricular hypertrophic and fibrotic responses in mice subjected to pressure overload. In our study, we found that miR-133 and miR-590 were down-regulated in the canine model of atrial fibrosis by administrating nicotine for 30 days. Transfection of miR-133 or miR-590 into cultured atrial fibroblasts decreased TGF-β1 and TGF-βRII levels and collagen content. Further experiments confirmed that miR-133 and miR-590 showed their protective roles on cardiac fibrosis by targeting TGF-β1 and TGF-βRII respectively. These effects were abolished by the antisense oligonucleotides against miR-133 or miR-590.

Conclusions The results uncover a novel molecular mechanism for myocardial fibrosis and provide a new strategy for the prevention and treatment of cardiac fibrosis.

GW23-e2522 A HOTSPOT MUTATION RYR2-R169Q FOR CHINESE PATIENTS WITH CATECHOLAMINERGIC POLYMORPHIC VENTRICULAR TACHYCARDIA doi:10.1136/heartjnl-2012-302920a.65

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Objectives Background: Catecholaminergic polymorphic ventricular tachycardia (CPVT), a malignant inherited arrhythmia, is characterized by stress-induced bidirectional or polymorphic ventricular tachycardia in absence of structural cardiac abnormalities. Unexplained syncope or sudden death in young individuals may be ascribed to CPVT. Mutations of RyR2 gene were proved to cause autosomal dominant CPVT, while mutations of CASQ2 gene cause rare autosomal recessive CPVT. To date, 155 RyR2 mutations have been reported to cause CPVT, but no mutation is identified in mainland of China. We intend to study the variants and prevalence of RyR2 gene mutations in the Chinese CPVT patients.

Methods The clinical characteristics of three CPVT families provided by the National Channellopathy Registry Study were investigated, including family and personal medical histories, 12-lead electrocardiography and 24-h ambulatory electrocardiography. DNA samples of the probands and their parents were extracted from serum leukocyte. 45 exons where the known mutation clusters located were first identified by direct DNA-sequencing of PCR-amplified DNA fragment. The primers used for PCR were designed with Primer3 or Oligo6 software. The remaining 60 exons would be identified if those results were negative.

Results A novel heterozygous mutation was found in exon 8 at the 506th nucleotide (506G>A) on RyR2 in a 9-year old Chinese female child. This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q) in a patient with CPVT. We also found a novel heterozygous mutation at the 506th nucleotide (506G>A) on RyR2 in a 9-year old Chinese female child. This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q). This substitution resulted in an amino acid change from arginin to glutamin at the 169th position (R169Q).

GW23-e2436 EFFECT OF PROPYL GALLATE ON ANGIONESIS OF TUMOUR AND MYOCARDIAL TISSUE IN TUMOUR-BEARING RATS AFTER ACUTE MYOCARDIAL INFARCTION doi:10.1136/heartjnl-2012-302920a.66

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Objectives To investigate the effects propylgallate for Injection (PG) on angiogenesis of tumour and myocardial tissue in tumour-bearing rats after acute myocardial infarction (AMI).

Methods Thirty male Wistar rats were established into AMI model group, and 24 h later, survived rats were randomized into two control groups (model group, propylgallate for Injection group) and N-nitrate-l-arginine methyl ester group (1-NAME group), which were injected the same amount of saline, propyl gallate 16.2mg/kg/d and 1-NAME 15mg/kg/d. Animals were anaesthetised and extracted samples after 14 weeks, the expression of vascular endothelial growth factor (VEGF) and basic fibroblast growth factor (bFGF) in rat myocardium were evaluated by immunohistochemistry, the expression of nitric oxide (NO), VEGF and transforming growth factor β1 (TGFβ1) were examined, the number of microvessel were counted by high-powered electron microscope (x400), the mean of microvessel were detected and mean density of microvascular (MDMV) were determined as capillary number·mm⁻².

Results Compared with model control group, the capillary density increased significantly in rat myocardium of propyl gallate group (196.25±108.24 mm⁻², p<0.01), the serum NO level also increased significantly (26.23±5.26 mmol/L, p<0.01), VEGF and bFGF expression of myocardial tissue in propyl gallate group was significantly higher than that in model group (p<0.01, p<0.05), in addition, capillary density of tumour tissue in propyl gallate group was not inhibited significantly.

Conclusions Propylgallate for Injection, whose effect on angiogenesis inhibition in tumour tissue after AMI is not significant, promotes angiogenesis in rat myocardium after AMI.

GW23-e1816 VASONATRIN PEPTIDE ATTENUATES MYOCARDIAL ISCHAEMIA/REPERFUSION INJURY THROUGH INHIBITING THE ENDOPLASMIC RETICULUM STRESS AND THUS ENHANCING THE CELL SURVIVAL SIGNALS IN DIABETIC RATS doi:10.1136/heartjnl-2012-302920a.67

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Objectives People with diabetes mellitus (DM) have a risk of ischaemic heart disease (IHD) two to five times greater than that in
nondiabetic individuals. Diabetic patients have significantly more severe and fatal myocardial infarctions than nondiabetic patients. Thus therapies for treating myocardial ischaemia/reperfusion (MI/R) have recently attracted considerable attention. It is known that atrial natriuretic peptide (ANP) and C-type natriuretic peptide (CNP) significantly reduces the MI/R damage in normal rats. Vasonatrin peptide (VNP) is an artificial synthetic chimera of ANP and CNP, however, the effects of VNP on acute MI/R injury, especially in patients with diabetes, were still unclear. This study was designed to investigate the effects of VNP on MI/R-induced cells injury (necrosis and apoptosis) and heart function in diabetic rats, and further study its underlying mechanisms.

Methods The high-fat diet-fed streptozotocin (HFD-STZ) rat model (type 2 DM model) was developed. Age- and gender-matched normal and DM rats were subjected to 30 min of myocardial ischaemia and 4 h of reperfusion.

Results Compared with the normal control, DM rats showed more severe myocardial functional impairment and injury. Treatment of DM rats with VNP (100 µg/kg i.v.) significantly improved the instantaneous first derivative of left ventricle pressure (±LV dp/dtmax) (2842±105) and (-2551±79) mm Hg/s vs (2636±90) and (3422±83) mm Hg/s in DM group, n=8), reduced infarct size ((43.52±1.15) % vs (53.46±10.15) %), plasma creatine kinase and lactate dehydrogenase activities, and apoptosis ((36.0±6.1) % vs. (43.32±8.15) % vs (53.46±10.15) %), plasma creatine kinase and lactate dehydrogenase activities, and apoptosis ((36.0±6.1) % vs. (43.32±8.15) % vs (53.46±10.15) %), compared with baseline. However, there was no significant changes in LA, LSPV and LIPV sites. In LSG group, the induction rate of AF was significantly increased (63.0% vs 27.10%, p<0.05; 70.8% vs 33.30%, p<0.05; 47.9% vs 18.80%, p<0.05), compared with baseline in LA, LSPV and LIPV respectively. However, there was no significant changes in RA sites. Compared with RSG stimulation, right stellate ganglionectomy can markedly decrease AF induction rate of RA (31.3% vs 73.3%, p<0.05), but it didn’t decrease the induction rate of LA, LSPV and LIPV. Compared with LSG stimulation, left stellate ganglionectomy can markedly decreased AF induction rate of LA, LSPV and LIPV (35.4% vs 63.0%, p<0.05; 59.6% vs 70.8%, p<0.05;25.0% vs 47.9%, p<0.05), but it didn’t decrease the induction rate of LA. (3) The effect on AF duration: In RSG group, the duration of AF was significantly prolonged in RA sites ((76.47±2.23)s vs (20.64±1.76)s, p<0.05), compared with baseline. However, there was no significant changes in LA, LSPV and LIPV sites. In LSG group, the duration of AF was significantly prolonged (respectively, (92.44±1.91)s vs (23.75±1.83)s, p<0.05; (81.72±3.05)s vs (20.80±3.60)s, p<0.05; (66.59±4.76)s vs (25.31±1.52)s, p<0.05), compared with baseline in LA, LSPV and LIPV respectively. However, there was no significant changes in RA sites. Compared with RSG stimulation, right stellate ganglionectomy can markedly shorten AF duration of RA ((76.47±2.23)s vs (25.12±4.67)s, p<0.05), but it didn’t shorten AF duration of LA, LSPV and LIPV. Compared with LSG stimulation, left stellate ganglionectomy can markedly shorten AF duration of LA, LSPV and LIPV((92.44±1.91)s vs (30.47±5.25)s, p<0.05; (81.72±3.03)s vs (38.32±4.12)s, p<0.05; (66.59±4.76)s vs (33.45±3.11)s, p<0.05), but it didn’t shorten AF duration of RA.

Conclusions Unilateral stellate ganglion electrical stimulation plus rapid atrial pacing for 6 h can successfully establish canine model of acute AF mediated by sympathetic nerve. Stellate ganglion stimulation promote AF induction and prolong AF maintenance in atrial and pulmonary sites. The inhibition sympathetic nerve activation by unilateral stellate ganglionectomy can reduce the AF initiating and sustaining. RSG is mainly associated with AF originating from RA, LSG is mainly associated with AF originating from LA and PV.

GW23-e0814 STELLATE GANGLION ELECTRICAL STIMULATION FOR ESTABLISHING A CANINE MODEL OF ACUTE ATRIAL FIBRILLATION MEDIATED BY SYMPATHETIC NERVE doi:10.1136/heartjnl-2012-302920a.68

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Objectives To build the methodology of acute animal model of atrial fibrillation (AF) induced by increased sympathetic nerve activity.

Methods Sixteen adult mongrel dogs weighing 18 to 25 kg were randomly divided into 3 groups. Control group (n=4) underwent 6-h rapid atrial pacing only. RSG group (n=6) underwent 6-h right stellate ganglion (RSG) stimulation plus rapid atrial pacing. LSG group (n=6) underwent 6-h left stellate ganglion (LSG) electrical stimulation plus rapid atrial pacing. AF induction rate, and AF duration in left atrium (LA), right atrium (RA), left superior pulmonary vein (LSPV) and left inferior pulmonary vein (LIPV) sites were measured.

Results (1) We successfully established canine models of acute AF induced by increased sympathetic nerve activity. The methods were relatively simple and repeatable. The AF duration was relatively long. (2) The effect on AF inducibility: In RSG group, the induction rate of AF was significantly increased in RA sites (73.30% vs 25.00%, p<0.05), compared with baseline. However, there was no significant changes in LA, LSPV and LIPV sites. In LSG group, the induction rate of AF was significantly increased (63.0% vs 27.10%, p<0.05; 70.8% vs 33.30%, p<0.05; 47.9% vs 18.80%, p<0.05), compared with baseline in LA, LSPV and LIPV respectively. However, there was no significant changes in RA sites. Compared with RSG stimulation, right stellate ganglionectomy can markedly decrease AF induction rate of RA (31.3% vs 73.3%, p<0.05), but it didn’t decrease the induction rate of LA, LSPV and LIPV. Compared with LSG stimulation, left stellate ganglionectomy can markedly decreased AF induction rate of LA, LSPV and LIPV (35.4% vs 63.0%, p<0.05; 59.6% vs 70.8%, p<0.05;25.0% vs 47.9%, p<0.05), but it didn’t decrease the induction rate of LA. (3) The effect on AF duration: In RSG group, the duration of AF was significantly prolonged in RA sites ((76.47±2.23)s vs (20.64±1.76)s, p<0.05), compared with baseline. However, there was no significant changes in LA, LSPV and LIPV sites. In LSG group, the duration of AF was significantly prolonged (respectively, (92.44±1.91)s vs (23.75±1.83)s, p<0.05; (81.72±3.05)s vs (20.80±3.60)s, p<0.05; (66.59±4.76)s vs (25.31±1.52)s, p<0.05), compared with baseline in LA, LSPV and LIPV respectively. However, there was no significant changes in RA sites. Compared with RSG stimulation, right stellate ganglionectomy can markedly shorten AF duration of RA ((76.47±2.23)s vs (25.12±4.67)s, p<0.05), but it didn’t shorten AF duration of LA, LSPV and LIPV. Compared with LSG stimulation, left stellate ganglionectomy can markedly shorten AF duration of LA, LSPV and LIPV((92.44±1.91)s vs (30.47±5.25)s, p<0.05; (81.72±3.03)s vs (38.32±4.12)s, p<0.05; (66.59±4.76)s vs (33.45±3.11)s, p<0.05), but it didn’t shorten AF duration of RA.

Conclusions Unilateral stellate ganglion electrical stimulation plus rapid atrial pacing for 6 h can successfully establish canine model of acute AF mediated by sympathetic nerve. Stellate ganglion stimulation promote AF induction and prolong AF maintenance in atrial and pulmonary sites. The inhibition sympathetic nerve activation by unilateral stellate ganglionectomy can reduce the AF initiating and sustaining. RSG is mainly associated with AF originating from RA, LSG is mainly associated with AF originating from LA and PV.

GW23-e0436 ASSOCIATION OF STAT3 WITH HSF1 PLAYS A CRITICAL ROLE IN G-CSF-INDUCED CARDIO-PROTECTION AGAINST ISCHAEMIA/REPERFUSION INJURY doi:10.1136/heartjnl-2012-302920a.69

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Objectives Granulocyte Colony-stimulating Factor (G-CSF) has been shown to be cardio-protective against ischaemia through activating Jak2/Stat3 pathway, however, the mechanism is unclear. Heat shock transcription factor 1 (HSF1), a definite endogenous protective protein in cardiomyocytes, may interact with Stat family under stress conditions. We hypothesised that G-CSF could induce cardio-protection against ischaemia/reperfusion (I/R) through association of HSF1 with Stat3.
Methods To test the hypothesis, we built cardiac I/R injury model with HSF1 knockout (KO) mice and wild type (WT) mice by occlusion of the left anterior descending (LAD) coronary artery for 30 min and subsequent release of the occlusion for 24 h. These mice were administered with G-CSF (100 μg/kg/day) or vehicle subcutaneously for three days before surgery.

Results As expected, G-CSF induced significant cardio-protections against I/R injury, characterised by higher ejection fraction (EF%), lower left ventricular end diastolic pressure (LVEDP), increased dP/dt value and decreased infarct area as compared with the vehicle treatment in WT mice. In HSF1-KO mice, however, these cardio-protections induced by G-CSF were greatly attenuated. Inhibition of oxidative stress-induced cardiomyocyte apoptosis by G-CSF also disappeared due to the deficiency of HSF1 in vitro and in vivo. Furthermore, G-CSF increased the phosphorylation and the association of Stat3 with HSF1, which enhanced transcriptional activity of HSF1. Inhibition of either Stat3 or HSF1 by pharmacological agents suppressed G-CSF-induced association of the two proteins and anti-apoptotic effect on cardiomyocytes.

Conclusions Our data suggest that G-CSF stimulates phosphorylation and association of Stat3 with HSF1 and therefore enhances transcriptional activity of HSF1, leading to the cardio-protection against I/R injury.

GW23-e0921 ADIPOSE DERIVED MESENCHYMAL STEM CELLS ENHANCE CARDIAC FUNCTION AFTER MYOCARDIAL INFARCTION VIA PARACRINE EFFECT
doi:10.1136/heartjnl-2012-302920a.71
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Objectives To determine if intramyocardial transplantation of adipose-derived mesenchymal stem cells (ADSCs) promotes cardiac function of infarcted hearts, and to determine the role of myocardial differentiation and paracrine effect in the cardioprotection of ADSCs.

Methods Mouse myocardial infarction (MI) model was established with ligation of the left anterior descending coronary artery (LAD) to create anterior wall infarction of the left ventricle. ADSCs from GFP transgenic mouse of passage 3 were enriched and their surface markers were identified by flow cytometry. ADSCs were induced by osteogenic media, adipogenic media and chondrogenic media for 21 days. The ADSCs were intramyocardially injected to the border zone of post-MI hearts. At the same time, conditioned medium (CM) collected from cultured ADSCs was intramyocardially injected to infarcted hearts. Cardiac function was detected after 4 weeks by echocardiography (GE vivid 7 dimensions). At the same time, immunohistochemistry was performed to identify newly formed GFP+ cardiomyocytes with α-actinin+ staining in the post-transplanted heart tissue.

Results ADSCs showed high expression of CD90, CD73, CD44, CD105 and low expression of CD34, CD45 and CD117. Chondrogenesis, osteogenesis and lipogenic differentiation of ADSCs were confirmed on day 21 with toluidine blue, von Kossa and Oil Red O staining, respectively. Left ventricular fraction shortening (FS) and ejection fraction (EF) were significantly decreased after MI (FS, pre-MI vs after MI: 62.9±6.3% vs 21.2±2.2%; EF, 90.2±5.2 vs 46.4±2.9%, p<0.05). With ADSC transplantation, FS and EF of infarcted hearts were significantly increased compared with control hearts (FS, 55.5±4.5%; EF, 68.7±8.6%). With condition medium injection, FS and EF of infarcted hearts were also significantly increased compared with control hearts (FS, 32.7±3.7%; EF, 62.3±4.9%), which is comparable to those of ADSC transplantation. No newly formed GFP+/α-actinin+ cardiomyocytes were found in the heart tissue.

Conclusions Intramyocardial transplantation of ADSCs significantly promotes cardiac function after Myocardial Infarction. The underlying mechanism for the cardioprotection of ADSC transplantation is possibly through paracrine factors of ADSCs rather than myocardial regeneration.
antagonists were given for 12 weeks. Total cholesterol (TC), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C) were examined by automatic biochemical analyzer. Thoracic aorta were taken for pathology. SR-BI, P-MeK1/2 and P-ErK1/2 were detected by western blot. Activities of protein kinase C (PKC) were measured by non-radioimmunoassay.

**Results**  The serum levels of TC, TG and HDL-C were (2.58±0.35) mmol/l, (0.67±0.039) mmol/L and (1.87±0.11) mmol/L in control group, while (22.20±1.29) mmol/L, (5.19±0.049) mmol/l and (2.26±0.274) in high-fat model group, which were significantly higher (p<0.01) compared with the control group. The serum levels of TG and HDL-C were (18.27±1.30) mmol/l, (1.83±0.145) mmol/l and (5.60±0.226) mmol/l in small doses of β3-AR agonist group, (17.06±1.52) mmol/l, (1.55±0.062) mmol/l and (4.35±0.257) mmol/l in large dose group. Compared with high-fat model group, the levels of TC, TG were significantly lower (p<0.01), HDL-C levels were significantly higher (p<0.01) in β3-AR agonist group, and large dose group was better than the small dose group (p<0.05). Compared with high-fat model group, thoracic aortic atherosclerotic plague areas decreased (p<0.01), lumen areas decreased (p<0.01), the expression of SR-BI, P-MeK1/2 and P-ErK1/2 increased (p<0.01), activities of liver PKC increased (p<0.01) in β3-AR agonist group. Large dose group was better than small dose group (p<0.05).

**Conclusions**  Excited β3-AR may decrease the levels of serum TC and TG, increase HDL, reduce the plaque area of thoracic aorta, increase liver SR-BI, P-MeK1/2 and P-ErK1/2, increase liver PKC activity in order to anti-atherosclerosis.
Conclusions Energy metabolism disorder and blood coagulation factor activity dysfunction influence each other, which is probably the proteomics characteristic of unstable angina patients. The research revealed part of biological foundation of unstable angina, discovered some possible key enzymes and signal pass way of unstable angina, and found the potential network regulatory mechanism of unstable angina. Some of the differentially expressed plasma proteins may become new biomarkers of unstable angina or unstable angina with blood stasis syndrome.

GW23-e1716  SNPs RS3825214 IN THE TBX5 GENE IS ASSOCIATED WITH LONE ATRIAL FIBRILLATION IN CHINESE HAN POPULATION

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Objectives The prolongation of the PR interval has been considered as an increased risk of atrial fibrillation (AF), pacemaker implantation and mortality. Several recent genome-wide association studies (GWAS) have yielded associations between common variants and echocardiogram (ECG) parameters. SNP rs3825214 in TBX5 gene was shown correlating with PR interval, QRS duration, QT interval and verified significant in diseases such as atrial fibrillation, advanced AV block. The aim of this study is to further assess association between SNP rs3825214 and ECG parameters, AF, ventricular tachycardia, as well as some other arrhythmias associating with sudden cardiac death in mainland Chinese Han population.

Methods 692 patients as AF group, 235 patients as VT group, and 856 controls in GeneID population were enrolled for case-control association study. Genotyping was performed using a Rotor-Gene TM 6000 High Resolution Melt system. The associations of both allele and genotype were analysed by rigorous statistical analysis adjusting for potential confounding factors.

Results In contrast to previous GWAS results, we did not find PR interval, QRS duration, QT interval significantly associated with SNP rs3825214, but the PR interval shows a tendency of association (p=0.057). QT was associated with SNP rs3825214 (p=0.047, β=-19.76). A significant association between G allele of SNP rs3825214 and lone atrial fibrillation (LAF) was arresting (p=0.002, P-adj=0.001, OR=0.652). In both AF and LAE group, the distributions were significantly different compared to the control group with p value equals to 0.029 and 0.005 respectively. Assuming a dominant genetic model, the GG shows strong association with AF, and especially LAF. The GG genotype was found with p value equals to 0.029 and 0.003 respectively.

Conclusions The study detected the association of allele G of SNP rs3825214 in TBX5 with QT, and lone AF for the first time. The findings expand the GWAS results to other ethnic population and provide new insight into the molecular aetiology involved in the pathogenesis of lone AF.

GW23-e2206  THE PROTECTIVE EFFECTS OF X-BOX BINDING PROTEIN 1 ON TUMOUR NECROSIS FACTOR-ALPHA INDUCED PRO-INFLAMMATORY RESPONSE

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Objectives Tumour necrosis factor alpha (TNF-α) is a potent pro-inflammatory factor playing a critical role in the initiation and progression of atherosclerosis. Exposure of vascular endothelial cells to TNF-α is known to induce adhesion molecule expression and inflammatory cytokine secretion, leading to endothelial dysfunction and apoptosis. X-box binding protein 1 (XBP1) is an active transcription factor involved in endoplasmic reticulum (ER) stress...
response including ER-associated protein degradation (ERAD). This study is to investigate the effect of spliced XBP1 on the expression of pro-inflammatory cytokines induced by tumour necrosis factor alpha (TNF-alpha) in human umbilical vein endothelial cells (HUVECs).

Methods Adenovirus encoding mouse spliced XBP1 (Ad-XBP1) were infected in cultured HUVECs. The overexpression of spliced XBP1 were examined by western blot analysis. Adenoviruses encoding green fluorescent protein (Ad-GFP) were used as control. Cell viability was measured by MTT assay. HUVECs were infected with Ad-XBP1 or Ad-GFP for 48 h, and then stimulated in the presence or absence of TNF-α (10 ng/ml) for 24 h. XBP1 knockdown was performed by Small RNA interference (siRNA). The knock-down efficiency was monitored by determining the protein level of XBP1 using western blot analysis. HUVECs were transfected with scramble siRNA or XBP1 siRNA using Lipofectamine 2000 for 6 h. The pro-inflammatory cytokines macrophage chemoattractant protein-1 (MCP-1) and intercellular adhesion molecule (ICAM-1) expression were upregulated by 40- and 16-fold respectively after TNF-α treatment. The up-regulation of ICAM-1 and MCP-1 mRNA expression were attenuated in Ad-XBP1-treated cells. In parallel, results from western blot analysis and ELISA further confirmed the reduction of ICAM-1 and MCP-1 protein levels induced by TNF-α in Ad-XBP1 treated cells. Moreover, downregulation of XBP1 by transfection with XBP1 siRNA increased the ICAM-1 and MCP-1 at both mRNA and protein level in HUVECs.

Results XBP1 suppresses TNF-α induced pro-inflammatory cytokines and increased cell viability in cultured HUVECs. Ongoing studies are focusing on the signalling pathways underlying the inhibitory effect of XBP1 on pro-inflammatory cytokines.

Results The up-regulation of IL-12 were upregulated to a significantly greater extent in apoE-deficient mice than in WT mice at both the mRNA and protein levels following administration of LPS or LPS plus IFN-γ. ApoE suppressed IL-12 p35 promoter in a dose-dependent manner, indicating that apoE-mediated p35 gene suppression is regulated at the level of transcription. Moreover, cells co-transfected with the p35 promoter and the apoE-expressing vector showed decreased promoter activities in response to IFN-γ and LPS treatments compared with cells co-transfected with the empty vector, PTyr, further demonstrating that apoE suppressed IL-12 p35 gene transcription under both basal and inducible conditions.

Conclusions Our study reveals that apoE suppresses IL-12 production at the level of transcription in macrophages, this effect may represent a novel anti-inflammatory activity of apoE.

GW23-e0381

**APOLIPOPROTEIN E SUPPRESSES IL-12 PRODUCTION IN MACROPHAGES**

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**Objective** Accumulation of T cells and macrophages in atherosclerotic plaques and the formation of antibodies directed against plaque proteins suggests that adaptive immunity contributes to the development of atherosclerosis. Apolipoprotein E (apoE) exerts potent anti-inflammatory effects that may contribute to protection against atherosclerosis independent of its role in lipid metabolism. Here, we investigated the expression of pro-inflammatory cytokine interleukin-12 (IL-12) in macrophages of apoE−/− mice and then further explored the molecular mechanisms.

**Methods** In this study, peritoneal macrophages and bone marrow-derived macrophages elicited from wild-type (WT) or apoE knock-out (apoE−/−) mice were stimulated with low-dose lipopolysaccharide (LPS), interferon-γ (IFN-γ) or LPS plus IFN-γ for 24 h, followed by collection of culture supernatants for measurement of IL-12 p40 and p70 protein secretion by ELISA. Meanwhile, cells treated with these stimuli for 4 h were used for RNA isolation and IL-12 p35 and p40 mRNA detection by quantitative real-time PCR. Then, we transiently co-transfected a human IL-12 p35 promoter luciferase construct with different amounts of apoE expression vector or PTyr, vector into THP-1 cells (a human macrophage cell line) by electroporation, followed by measurement of luciferase activity in cell lysates.

**Results** The expression of IL-12 were upregulated to a significantly greater extent in apoE-deficient mice than in WT mice at both the mRNA and protein levels following administration of LPS or LPS plus IFN-γ. ApoE suppressed IL-12 p35 promoter in a dose-dependent manner, indicating that apoE-mediated p35 gene suppression is regulated at the level of transcription. Moreover, cells co-transfected with the p55 promoter and the apoE-expressing vector showed decreased promoter activities in response to IFN-γ and LPS treatments compared with cells co-transfected with the empty vector, PTyr, further demonstrating that apoE suppressed IL-12 p35 gene transcription under both basal and inducible conditions.

**Conclusions** Our study reveals that apoE suppresses IL-12 production at the level of transcription in macrophages, this effect may represent a novel anti-inflammatory activity of apoE.

GW23-e0344

**EXOGENOUS HIGH MOBILITY GROUP BOX 1 PROTEIN IMPROVES CARDIAC FUNCTION AFTER MYOCARDIAL INFARCTION IN RATS**

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**Objective** Exogenous high mobility group box 1 protein (HMGB1) injection could prevent left ventricular remodelling and enhance left ventricular function during myocardial infarction (MI). However, the mechanism remains unclear. This study was to investigate in the mechanism of cardioprotection of HMGB1 during MI in rats.

**Methods** Anesthetised male rats were treated once with HMGB1 (200 ng) 4 h after MI; and then executed after 7 and 28 days, respectively. Cardiac function was measured by echocardiography. Collagen deposition were measured by masson trichrome. Dishevelled-1 protein has a sudden drop in MI group in both 7 days and 28 days (p<0.05). However, dishevelled-1 protein was significantly reduced in the HMGB1-treated group in infarcted border zone. The expression of IL-12 were upregulated to a significantly greater extent in MI-HMGB1/28 days (p<0.05). Conversely, the expression of IL-12 were upregulated to a significantly greater extent in apoE-deficient mice than in WT mice at both the mRNA and protein levels following administration of LPS or LPS plus IFN-γ. ApoE suppressed IL-12 p35 promoter in a dose-dependent manner, indicating that apoE-mediated p35 gene suppression is regulated at the level of transcription. Moreover, cells co-transfected with the p55 promoter and the apoE-expressing vector showed decreased promoter activities in response to IFN-γ and LPS treatments compared with cells co-transfected with the empty vector, PTyr, further demonstrating that apoE suppressed IL-12 p35 gene transcription under both basal and inducible conditions.

**Conclusions** Our study reveals that apoE suppresses IL-12 production at the level of transcription in macrophages, this effect may represent a novel anti-inflammatory activity of apoE.
increasing from 7 to 28 days in MI-HMGB1/7 days and MI-HMGB1/28 days (p<0.05). Compared with sham-operated group, expression of dishevelled-1 mRNA increases both in MI/7 days and MI-HMGB1/7 days (p<0.05), and then the dishevelled-1 gene expression decreased abruptly in MI/28 days (p<0.05). While the dishevelled-1 mRNA expression has a markedly increasing in MI-HMGB1/28 days group (p<0.05).

**Conclusions** Our study suggested that exogenous high mobility group box 1 protein injection improves cardiac function after MI which may be involved in Wnt/β-catenin signalling activation.

**GW23-e0270**

**EFFECTS OF GENISTEIN ON REGULATION OF DIHYDROTESTOSTERONE-INDUCED CELL PROLIFERATION IN ENDOTHELIAL AND PROSTATE CANCER CELLS**

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**Objectives** There is currently no cure therapy available once prostate cancer is metastasised, and androgen deprivation is one of the standard therapies. However, the long-term use of oestrogens in treatment of prostate cancer is limited due to their cardiovascular side effects, such as thrombosis and cardiovascular events. This study was to examine the effect of genistien comparing to 17b-oestradiol induced cell proliferation in HAEC and LAPC-4 cells without any inhibition of DHT-induced cell proliferation in LNCaP cells.

**Methods** MTS, RT-PCR, and Western blot were used to detect cell proliferation, mRNA and protein expression of oestrogen receptor (ER) gene, and cyclin A genes, respectively. Specific ERβ siRNA was synthesised and transfected to knockdown ERβ expression in prostate cancer cells.

**Results** Dihydrotestosterone (DHT) produced a time and dose-dependent induction of cell proliferation in HAEC, LAPC-4 and LNCaP cells. These DHT actions were inhibited by genistein in a dose-dependent way in LAPC-4 and LNCaP cells but not in HAEC cells. While bE2 only attenuated the DHT-induced cell proliferation in HAEC and LAPC-4 cells without any inhibition of DHT-induced cell proliferation in LNCaP cells. Moreover, treatment with bE2 alone in LNCaP cells significantly increased cell proliferation. In LAPC-4 cells, knockdown of ERβ expression partially eliminated the blockade of DHT-induced cell proliferation.

**Conclusions** This study demonstrates that genistein may be a potential agent for prostate cancer therapy since genistein inhibits DHT-induced LAPC-4 and LNCaP prostate cancer cell proliferation but not HAEC cell growth. 17b-oestradiol completely blocked DHT-induced cell growth in HAECs while inhibiting LAPC-4 cell proliferation, accounting for the side-effect of cardiovascular in Androgen deprivation therapy of prostate cancer with 17b-oestradiol. DHT-induced LNCaP prostate cancer cell proliferation cannot be attenuated by 17b-oestradiol instead 17b-oestradiol induced LNCaP cell growth dose-dependently, suggesting 17b-oestradiol is inactive in treating metastasized prostate cancer. ERβ played an important role in the modulation of androgen receptor actions.

**GW23-e0285**

**TONGXINLUO CAPSULE PROTECTS ENDOTHELIAL CELLS FROM HYDROGEN PEROXIDE-INDUCED CELL SENESCENCE BY MODULATING REDOX STATUS**

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**Objectives** Senescence of endothelial cells has been proposed to play an important role in endothelial dysfunction and atherogenesis. In the present study we aimed to investigate whether Tongxinluo (TXL) capsule protects human umbilical vein endothelial cells (HUVECs) from H2O2-induced endothelial senescence.

**Methods** Solation, culture and identification of HUVECs: With the informed consents of puerperants, the normal fetal umbilical cords were obtained through uterine-incision delivery in Third Affiliated Hospital, Sun Yat-sun University. HUVECs were isolated by Percoll density gradient centrifugation from fetal umbilical cords with digestion of collagenase type I perfusion, and then suspended in Medium 199 cultured in 0.05 volume fraction of CO2 incubator at 37°C. After the HUVECs were identified by flow cytometry with the cell marker CD31, The second or third passage was used for study. The exponentially growing HUVECs were plated at a cell density of 1×10⁵/well in 6-well plate and cultured overnight at 37 °C. The next day, the medium was changed with M199 supplemented with 2% FBS for at least 8 h to starve the cells. Then the cells were exposed to various concentrations of H2O2 to induce premature senescence. After 1 h, the medium was replaced with normal medium. Different concentration of TXL (0.1, 0.5, 1.0, and 2.0 mg/ml) was added in the media 30 min before the induction of senescence by addition of H2O2. Finally the cells were harvested in indicated time for Western blot analysis and real-time polymerase chain reaction (PCR). The MDA level and SOD activity were determined using commercially available kits following the manufacturer’s instructions. Intracellular ROS generation was monitored by flow cytometry using peroxide sensitive fluorescent probe 2’,7’-dichlorofluorescein diacetate (H2DCFDA, Invitrogen).

**Results**

1. Treatment with H2O2 caused significant increase in intracellular thiobarbituric acid reactive substances (TBARS) level (p<0.01 vs untreated control), while pre-incubation with TXL (0.5, 1.0 mg/ml) markedly attenuated the increase (p<0.05). Compared to control group, treatment with H2O2 decreased the activity of SOD to 50.4±6.9%. However, pre-incubation with TXL (0.1, 0.5, 1.0, and 2.0 mg/ml) significantly increased SOD activity compared with H2O2 alone treated group (p<0.01).

2. Real-time PCR analysis showed that at the time point of 24 h, SOD1 mRNA in the 60mmol/l H2O2 treated group decreased by 1.99 fold, compared with untreated group (p<0.01). However, pre-incubation with TXL (0.1, 0.5, 1.0, and 2.0 mg/ml) significantly increased SOD activity compared with H2O2 alone treated group (p<0.01).

3. Western blotting results demonstrated that the level of SOD1 protein reduced in H2O2 treated group compared to untreated group. TXL significantly increased SOD1 protein expression partially eliminated the blockade of H2O2-induced cell proliferation.

4. Treatment with TXL alone did not change the ROS generation. However, compared to the nontreated control group, 60 mmol/l H2O2 significantly increased DCF fluorescence whereas pre-treatment with 1.0 mg/ml TXL markedly inhibited the production of ROS induced by H2O2.
Conclusions our data demonstrate that ginseno side TXL modulates redox status such as upregulating SOD1 expression, scavenging ROS, and decreasing the peroxidation to prevent the cellular senescence in HUVECs.

GW23-e0290 EFFECTS OF JIAWEI BUYANG HUANWU DECOCTION ON VASCULAR STENOSIS AND TGF-β1 AFTER BALLOON INJURY OF RABBIT ILIAC ARTERY

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Objectives To investigate the effects of Jiawei Buyang Huanwu Decoction on vascular stenosis and transforming growth factor-β1 (TGF-β1) after iliac artery were injured by balloon in diet-induced atherosclerotic rabbits.

Methods 24 male New Zealand albino rabbits were equally randomized into control group, model group and drug group. The iliac arteries of the rabbits in the latter two groups were subjected to balloon injury. Four weeks later, serum TGF-β1 level was assayed, Endothelial hyperplasia, eNOS Protein and mRNA expression were observed in injured iliac artery.

Results Optical microscope revealed narrowed vascular lumen, thickened intima and numerous atherosclerotic plaques in the model group compared with the control group, whereas the vascular lumen and intima thickness remained basically normal in drug group. The serum TGF-β1 level was lower in drug group than that of model group. Immunohistochemistry and RT-PCR results showed that eNOS protein and mRNA expression was lower in rabbit iliac artery of drug group than that in model group.

Conclusions Jiawei Buyang Huanwu Decoction can lessen intimal hyperplasia and vascular stenosis in iliac artery injury rabbits, and the mechanism of which may be related to decrease in TGF-β1 protein and gene expression.

GW23-e0312 MENSTRUAL BLOOD STEM CELLS ATTENUATE POST-INFARCTION MYOCARDIAL FIBROSIS VIA INHIBITING ENDOTHELIAL TO MESENCHYMAL TRANSITION (ENDMT)

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Objectives Menstrual blood stem cells (MBSCs) have been reported to offer superior protective effects over bone marrow mesenchymal stem cells (MSCs) on cardiac performance lost after myocardial infarction. The exact protective mechanisms of MBSCs are still elusive. The present study aimed to investigate effects and relevant mechanisms of MBSCs on myocardial fibrosis that impairs heart function by inducing cardiac remodelling, decreasing myocardial compliance, and compromising normal electrical conduction.

Methods Eighteen 10-week old male SD rats randomised to 3 groups (n=6 each), they were subjected to left anterior descending coronary artery (LAD) ligation and treated with intramyocardial injection of 2×10^6 MBSCs (MBSCs group) or equal volume of DMEM (MI group), or sham operation procedure (Sham group) for 7 days. Myocardial fibrosis was evaluated by picrosirius red staining followed by a quantitative analysis of collagen volume fraction (CVF), and changes of endothelial markers (CD31 and VE-cadherin), and markers of fibroblasts (FSP-1) and myofibroblasts (α-SMA) in heart tissue were detected by immunofluorescence, immuno blotting and real-time RT-PCR, respectively. Cells isolated from cardiac scar were quantitatively analysed with FACS in order to reveal the effect of MBSCs on cardiac fibroblasts produced through EndMT characterised by emerging of CD31+/α-SMA+ cells.

Results In comparison with MI group, MBSCs decreased CVF by about 5% ((14.6±1.8) % vs (19.8±2.1)%, p<0.05), MBSCs preserved loss of endothelial markers (CD31 and VE-cadherin) and attenuated gain of markers of fibroblasts/myofibroblasts (FSP-1 and α-SMA) after MI, and reduced CD31+/α-SMA+ cells (EndMT) by about 10% ((30.9±2.6)% vs (19.9±1.8)%, p<0.01).

Conclusions MBSCs can attenuate cardiac fibrosis emerged after myocardial infarction; inhibition of EndMT is a protective mechanism of MBSCs treatment that contributes to improvement of cardiac remodelling after myocardial infarction.

GW23-e0151 LYSOPHOSPHATIDIC ACID PROLONGS ACTION POTENTIAL DURATION AND INCREASES ELECTROPHYSIOLOGICAL INSTABILITY OF ADULT RABBIT VENTRICULAR MYOCARDIUM BY AUGMENTING L-TYPE CALCIUM CURRENT

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Objectives Lysophosphatidic acid (LPA) has various actions on cardiovascular system and is widely reported to modulate multiple ion currents in non-myocardiacocytes, but little is known about its electrophysiological effects on cardiac myocytes. The present experiments were designed to investigate whether LPA had electrophysiological effects on the isolated rabbit myocardial preparations.

Methods Action potentials and L-type calcium currents were recorded in myocytes of left ventricle from 10 adult rabbits using a single-pipette whole-cell patch-clamp. Arterially perfused rabbit left ventricular preparations were used to simultaneously record transmural electrocardiogram as well as monophasic action potentials from the endocardium.

Results LPA prolonged action potential duration at 90% repolarisation (APD90) in a concentration and frequency-dependent manner in the isolated rabbit ventricular myocytes. The application of extracellular LPA (10 µmol/l) increased coefficient of APD90 variability from (2.34±0.31) to (4.69±0.94) (p<0.01). LPA (10 µmol/l) significantly increased L-type current amplitudes (I_{Ca,L}) density from −5.92±0.68 to −6.63±0.61 pA/pF (p<0.05) without altering activation or deactivation properties. In arterially perfused rabbit left ventricular wedge preparations, monophasic action potential duration from (215.01±4.85 to 238.64±7.46 ms, p<0.01), QT interval from (276.47±38 to 291.40±46 ms, p<0.01) and Tpeak-end from (28.85±5.48 to 51.12±5.53 ms, p<0.01) were prolonged by LPA (10 µmol/l), which also significantly increased the incidence of ventricular tachycardias induced by Scn stimulation.

Conclusions We concluded that LPA prolonged APD and increased electrophysiological instability of the isolated rabbit myocardial preparations by augmenting I_{Ca,L}.
GW23-e0812  INCREASED ABCG1 EXPRESSION PROTECTS AGAINST ENDOTHELIAL INJURY INDUCED BY TNF-α

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Objectives Endothelial dysfunction is a key feature of early atherosclerosis lesions. ATP binding cassette transporter G 1(ABCG1), a regulator of reversing cholesterol efflux, is highly expressed in endothelial cells. It has been shown that ABCG1 deficiency in mice promotes endothelial activation and upregulation of ABCG1 seems to preserve endothelial function. The study was to further determine the role of ABCG1 in endothelial injury induced by TNF-α.

Methods Human Umbilical Vein endothelial cells (HUVECs) were incubated in the presence of 10 ng/ml TNF-α and/or liver X receptor (LXR) agonist T0901317 for 0, 12 and 24 h. Real-time PCR and western blot were used to measure ABCG1 expression. The nitric oxide synthase (NOS) activity was determined by quantifying the rate of the conversion of [3H] L-arginine to [3H] l-citrulline and NO concentration in cultured media was measured by nitrate reductase assay. Intracellular malonaldehyde (MDA) content and reactive oxygen species (ROS) were measured to show oxidative stress levels in TNF-α treated HUVECs.

Results 10ng/ml TNF-α decreased both ABCG1 expression and NOS activity, and induced intracellular oxidative stress in a time-dependent manner in cultured endothelial cells. Moreover, T0901317, a LXR agonist, significantly increased the ABCG1mRNA expression by 5 times when 5 μg/ml T0901317 treated HUVECs for 24 h. With upregulation of ABCG1, decreased NOS activity induced by TNF-α was reversed about 47%, and concomitant NO levels was reversed by 30% when treatment of the cells with the T0901317. In addition, increased MDA content by TNF-α was abolished by 50% and increased intracellular ROS was significantly decreased with the use of T0901317.

Conclusions These results suggest that increased ABCG1 expression play an important role in preventing from oxidative stress and endothelial injury induced by TNF-α. Uregulation of ABCG1 has a protective effect on endothelial function.

GW23-e0825  THE ASSOCIATION BETWEEN CYP2C19*2 GENE POLYMORPHISMS AND CLOPIDOGREL RESISTANCE IN THE HAN POPULATION OF NORTH CHINA WITH CORONARY ATHEROSEDICEROTIC HEART DISEASE

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Objectives Due to the diversification of platelet function test and defined criteria applied in previous studies, there is a big difference in the incidence of CR. Besides, it remains unclear of the mechanisms underlying CR and gene polymorphisms is regarded as an major factor of individual differences of drug response. The present study aimed to elucidate the preliminary association between CYP2C19*2 (Cytochrome P450 2C19,CYP2C19*2) gene polymorphisms that plays an important role in clopidogrel biotransformation to its active form and CR in the Han population of North China with Coronary Atherosclerotic Heart Disease (CAHD). We further attempted to provide evidence on the early predication of CR and implement of individualised and rationalised drug therapy when a variety of new antiplatelet drugs were available nowadays.

Methods 156 patients with angiographically documented CAHD in the Han population of North China were enrolled from Mar.2011 to Feb.2012. The vasodilator-stimulated phosphoprotein (VASP) phosphorylation state was determined by flow-cytometry in all patients received a 600mg loading dose of Clopidogrel. Patients enrolled were divided into CR group and Non-CR (Non-clopidogrel resistance, NCR) group according to the value of VASP index. A VASP index of >50% was regarded as CR. The presence of CYP2C19*2 polymorphisms was determined by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) analysis combined with sanger dideoxy mediated chain termination method. The distribution of the frequencies of genotypes and alleles among CR and NCR groups was analysed.

Results Demographic and Clinical characteristics including age, gender, history of Hypertension, Dyslipidemia, concurrent medications, such as Stains, Calcium channel inhibitors, Proton pump inhibitor, did not differ between the two study groups (p>0.05). When compared with the NCR group, the proportion of Overweight, Type2 Diabetes mellitus and ACS were significantly higher in the CR group (p<0.05) while the proportion of smokers were significantly higher in the NCR group (p<0.05).80 patients was defined as CR, indicating the occurrence of CR at a rate of 58.82%. Patients with ACS were at a higher rate of occurrence of CR than patients with SAP (67.12% vs 51.67%, p<0.05). The genotype (GG/GA/AA) distribution of the CYP2C19*2 gene polymorphisms were 47.54%,46.22%,6.24% and 69.63%,26.80%,3.57% in the CR and NCR groups, respectively. Statistically significant difference was observed between CR and NCR groups for distribution of the genotypes (p<0.05). Frequency of AA genotype was significantly higher in CR group than in NCR group (p<0.05). Frequency of A allele was significantly higher in CR group than in NCR group (29.57% vs 16.96%, p<0.05). A allele carriers were more likely to develop CR(OR=2.04, 95% CI:1.12 to 3.71, p=0.05). Binary logistic regression analysis adjusted for the presence of traditional risk factors including Age, Gender, BMI, Smoking, Hypertention, Dyslipidemia, Type 2 Diabetes, the CYP2C19*2 polymorphism resulted an independent risk factor for CR (OR=3.25, 95% CI:1.23 to 4.19, p<0.05).

Conclusions CYP2C19*2 gene polymorphism is associated with the occurrence of CR in the Han population of North China with CAHD; CYP2C19*2, that is to say, A allele might be an important genetic risk factor for the development of CR.
application X-strain software analysis come to the heart of the heart and the apex level, the rotation angle of sub-epicardial myocardial peak, calculation of left ventricular heart, sub-epicardial myocardial myocardial reverse angle peak, analysis the relativities between the rotation and torsion angle peak in cardiac structure and function parameters, heart rate, blood pressure and thyroid hormone levels and other factors.

Results

1. Group A, B before and after treatment compared with the control group, left ventricular structure and function parameters (LVDd, LVDs, IVSd, PWd, LVEF), the difference was not statistically significant (p>0.05). B group before treatment, left ventricular outflow tract velocity (LVOT-V) higher than that of the control group (p<0.01) after treatment compared with control group difference not statistically significant (p>0.05).

2. The apex level of the heart, sub-epicardial myocardial rotation angle peak (EN-PAR, the EP-PAR) compared with Group A before treatment EN-PAR, the EP-PAR higher than that in the control group, EN-PAR, EP-PAR of Group B is lower than control group (EN: 6.01±2.54 vs 5.18±2.17 vs 4.38±2.46 vs; EP: 2.31±1.06 vs 1.57±1.04 vs 1.54±0.78, p<0.01); after treatment, EN-PAR, EP-PAR of Group A than before treatment to improve the only EP-PAR were significantly improved (Group A: EN:5.27±2.11 vs 6.01 ±2.54; EP:1.87±1.04 vs 2.31±1.06, Group B: EN:4.81±2.17 vs 4.38±2.46; EP:1.77±1.01 vs 1.54±1.01, p<0.01).

3. The heart of global left ventricular sub-epicardial myocardial rotation angle peak (EN-Ptor, the EP-Ptor) comparison of Group A before treatment EN-Ptor, EP-Ptor higher than that in the control group, B EN-Ptor, EP-Ptor lower the control group (EN: 11.18 ±4.04 vs 9.53±2.69 vs 7.77±3.55; EP: 4.46±1.38 vs 3.86±1.22 vs 2.97±1.11, p<0.01); after treatment, EN-Ptor, EP-Ptor of A and B improved (Group A: EN:9.83±2.60 vs11.18±4.04; EP:3.90±1.20 vs 4.46±1.58, Group B: EN: 9.01±2.69 vs 7.77±3.55; EP: 3.93±1.11 vs 2.97±1.12, p<0.05) than before treatment.

4. The level of the heart within the heart, sub-epicardial myocardial rotation angle peak (EN-FBR, the EP-FBR) Comparison of the B group before treatment and after treatment EN-OF BFR, the EP-FBR in the control group, no statistically significant difference (p>0.05).

5. The apex of the heart, sub-epicardial myocardial rotation angle peak SBE HR, LVOT-V showed a negative correlation (p<0.01), and thyroid hormone levels (FT3, FT4 and TSH) no correlation (p>0.05).

Conclusions

1. Hyperthyroidism in patients with early heart apex level, the adventitia of myocardial rotation and left ventricular peak torsion angle increases, decreases with the extension of the course.
2. Has not yet appeared hyperthyroid heart disease, hyperthyroidism in patients with early left ventricular systolic function enhanced with the extension of the course to reduce.
3. Short duration of the hyperthyroid patients after treatment, left ventricular regional systolic function of recoverability, the duration of the elderly cannot be fully restored.
4. Change of the rotational motion of hyperthyroidism in patients with myocardial and hemodynamic changes in patients.
5. STI can evaluate regional myocardial systolic function in patients with hyperthyroidism.
(2) Compared with NG group, the protein level of fibronectin and type III collagen in the conditioned media of cultured cardiomyocytes exposed to high glucose were significantly increased (p<0.01), and with the treatment of anti-CTGF antibody the two protein level could be significantly decreased (p<0.01), but was still higher than the level in the NG group (p<0.01).

(3) Cardiomyocytes cultured in high glucose, but not mannitol, showed an increased expression of CTGF mRNA and protein. Moreover, with the time lasting there was a higher expression of CTGF mRNA and protein (p<0.05 or p<0.01). The effect of high glucose on CTGF gene and protein expression could be significantly inhibited when the cardiomyocytes were incubated in high glucose combined with anti-CTGF antibody (p<0.01).

Conclusions Our data suggest that high glucose can significantly upregulate the expression of CTGF mRNA and protein and stimulate the synthesis of fibronectin and type III collagen in the cultured cardiomyocytes of neonatal rats. Hypertrophy, increased diameter and the synthesis of fibronectin and type III collagen induced by high glucose in the cultured cardiomyocytes could be mediated partly by CTGF and anti-CTGF antibody can block the effects of high on the cultured cardiomyocytes

GW23-e1253 EFFECTS OF XERODERMA PIGMENTOSUM D GENE ON PROLIFERATION INDUCED BY INTERLEUKIN-6 IN VASCULAR SMOOTH MUSCLE CELLS

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Objectives Excessive proliferation vascular smooth muscle cells (VSMC) can promote the development of atherosclerosis. And, in the development of atherosclerosis, interleukin-6 (IL-6) enhance excessive proliferation of VSMC. As studies have showed, up-regulation of xeroderma pigmentosum D (XPD) gene could induce apoptosis of a variety of cells. However, it has not been reported whether there is any effect of XPD on proliferation and apoptosis of VSMC. To investigate effects of XPD on proliferation induced by IL-6 in human VSMC and its association with atherosclerosis, this study was carried out.

Methods

1. Recombinant plasmid pEGFP-N2/XPD and vacant vector plasmid pEGFP-N2 were transfected stably into VSMC by liposome, and then these cells were incubated with IL-6 at a 100 U/mL concentration for 48 h. The experiments were divided into six groups: blank control group; pEGFP-N2 group; pEGFP-N2/XPD group; IL-6 group; IL-6+pEGFP-N2 group; IL-6+pEGFP-N2/XPD group.

2. The expression of green fluorescent protein was observed through fluorescence microscopy.

3. The cell growth was detected by MTT.

4. The cell cycle and apoptosis rate were examined with flow cytometry.

5. Through RT-PCR and Western blotting, the expression levels of XPD, Bcl-2, Bax and wild type P53 (wt-P53) were detected.

Results

1. By fluorescence microscopy, green fluorescences were observed in the cells transfected with pEGFP-N2/XPD or pEGFP-N2, indicating that the plasmids were transfected successfully.

2. MTT results showed that the transfection of pEGFP-N2/XPD inhibited the cell growth (p<0.05), and reduced the positive effects of IL-6 on VSMC growth (p<0.05).

3. Flow cytometry results showed that the transfection of pEGFP-N2/XPD increased the apoptosis rate of VSMC (p<0.01) and the cell amounts of G0/G1 phase (p<0.05), decreased the cell amounts of S phase (p<0.05), and reduced the effects that IL-6 decreased the apoptosis rate of VSMC and the cell amounts of G0/G1 phase, increased the cell amounts of S phase (p<0.01).

4. RT-PCR results and western blotting results showed that the transfection of pEGFP-N2/XPD increased the expression of XPD, Bax and wt-P53 (p<0.05 or p<0.01), decreased the expression of Bcl-2 (p<0.05 or p<0.01), and reduced the effects that IL-6 decreased the expression of Bax and wt-P53, increased the expression of Bcl-2 (p<0.05 or p<0.01).

Conclusions XPD gene can inhibit VSMC proliferation, promote VSMC apoptosis, and reduce the effects that IL-6 promotes VSMC proliferation and inhibits VSMC apoptosis. Therefore, XPD gene is likely to be potential molecular target for treatment of atherosclerosis.

GW23-e1257 EFFECTS OF SUPPRESSOR OF CYTOKINE SIGNALLING-1 ON PROLIFERATION INDUCED BY OXIDATIVE LOW-DENSITY LIPOPROTEIN IN VASCULAR SMOOTH MUSCLE CELLS

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Objectives Excessive proliferation vascular smooth muscle cells (VSMC) can promote the development of atherosclerosis. And, in the development of atherosclerosis, oxidative low-density lipoprotein (oxLDL) enhance excessive proliferation of VSMC. As studies have showed, down-regulation of suppressor of cytokine signalling-1 (SOCS1) could induce apoptosis of a variety of cells. However, it has not been reported whether there is any effect of SOCS1 on proliferation and apoptosis of VSMC. To investigate effects of SOCS1 on proliferation induced by oxLDL in human VSMC and its association with atherosclerosis, this study was carried out.

Methods

1. siRNA targeting SOCS1 gene (SOCS1-siRNA) and negative control siRNA (NC-siRNA) were transfected into VSMC by liposome, and these cells were incubated with oxLDL at a 100 μg/ml concentration for 48 h. The experiments were divided into six groups: blank control group; NC-siRNA group; SOCS1-siRNA group; oxLDL group; oxLDL+NC-siRNA group; oxLDL+SOCS1-siRNA group.

2. Through RT-PCR and Western blot, the expression levels of SOCS1, Bcl-2, Bax and wild type P53 (wt-P53) were detected.

3. The cell growth was detected by MTT.

4. The cell cycle and apoptosis rate were examined with flow cytometry.

Results

1. RT-PCR results and western blot results showed that the transfection of SOCS1-siRNA increased the expression of Bax and wt-P53 (p<0.05), decreased the expression of SOCS1 and Bcl-2 (p<0.05 or p<0.01), and reduced the effects that oxLDL decreased the expression of Bax and wt-P53, increased the expression of Bcl-2 (p<0.05 or p<0.01).

2. MTT results showed that down-regulation of SOCS1 inhibited the cell growth (p<0.05), and reduced the positive effects of oxLDL on VSMC growth (p<0.05).

3. Flow cytometry results showed that down-regulation of SOCS1 increased the apoptosis rate of VSMC (p<0.01) and the cell amounts of G0/G1 phase (p<0.05), decreased the cell amounts of S phase (p<0.05), and reduced the effects that oxLDL decreased the apoptosis rate of VSMC and the cell amounts of
G0/G1 phase, increased the cell amounts of S phase (P respectively<0.01).
Conclusions Down-regulation of SOCS1 can inhibit VSMC proliferation, promote VSMC apoptosis, and reduce the effects that oxLDL promotes VSMC proliferation and inhibits VSMC apoptosis. Therefore, SOCS1 gene is likely to be potential molecular target for treatment of atherosclerosis.

GW23-e1413 HIGH PREVALENCE OF TYPE-2 DIABETES IN CHINESE OIL WORKERS: INTERACTION BETWEEN SAA1 GENE AND WORK STRESS
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Objectives Serum Amyloid A (SAA) was reported associated with insulin resistance and type-2 diabetes. The present study aimed to investigate the prevalence of type-2 diabetes and its association with SAA1 genetic polymorphisms in Chinese oil workers.

Methods Three stages were performed for the present study. In the stage one, a cross-sectional survey was designed to investigate the prevalence of type-2 diabetes in oil workers; in the stage two, we detected the SAA1 genetic polymorphisms and analysed their association with serum glucose (GLU) levels; in the stage three, we designed a nested case–control study to analyse the association of diabetes with SAA1 gene polymorphisms.

Results Overall, the prevalence of type-2 diabetes was 15.6% in total, 14.9% in men, and 18.0% in women, respectively. In nondiabetic individuals, rs2229353, rs4660980 and rs12218 were found to be significantly associated with serum GLU levels before and after multivariate adjustment (all P<0.05). In the nested case–control study, we found rs2229353, rs12218, and rs11603089 was associated with Type-2 diabetes by univariate analysis, respectively (all P<0.05). After adjustment of confounders, the difference remained significant in rs2229353 (P=0.015, OR=2.610 (95% CI: 1.204 to 5.656)) and rs12218 (P=0.018, OR=2.797 (95% CI: 1.197 to 6.537)). Furthermore, there was a significant interaction between rs2229353 and work stress on type 2 diabetes (P=0.001, OR=2.304 (95% CI: 1.387 to 3.829)).

Conclusions Type 2 diabetes is highly prevalent in Chinese oil workers. The genetic polymorphisms of SAA1 were associated with serum glucose levels in nondiabetics and were independent risk factors of type 2 diabetes in Chinese oil workers.

GW23-e1101 LONG-TERM ENHANCED EXTERNAL COUNTERPULSATION DOWNREGULATES THE MACROPHAGE MIF-1α EXPRESSION OF VASCULAR ENDOTHELIAL CELLS IN ATHEROSCLEROTIC PIGS
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Objectives Mechanisms underlying the beneficial effects of Enhanced External Counterpulsation (EECP) in atherosclerotic diseases are not well defined. Since macrophage Migration Inhibitory Factor (MIF), as a novel pro-inflammatory and immuno-regulatory factor, has recently been believed to play a pivotal role in the pathogenesis of atherosclerosis including macrophages, smooth muscle cells and vascular endothelial cells (VECs), we hypothesized that long-term EECP could downregulate the expression of MIF in VECs of atherosclerotic lesions, contributing to its clinical outcomes. We studied this hypothesis in a porcine model of atherosclerosis.

Methods Eighteen 20-day-old male domestic pigs were randomly assigned into three groups: the normal control group (normal group, n=6), the hypercholesterolemic control group (HC group, n=6) and the hypercholesterolemic+EECP group (EECP group, n=6). Pigs in normal group were fed with normal diet, while the pigs in the other two groups were fed with cholesterol-rich diet in order to induce atherosclerosis. Six pigs in EECP group were anesthetised by intramuscular injection of 846 mixture and intravenous infusion of pentobarbital sodium. The EECP procedures were performed on them for 2 h every 2 days with 0.035 MPA/cm² pressure, summed total 36 h. After the end of EECP, all the pigs were sacrificed by injecting overdose of 10% potassium chloride into the heart. For each animal, the thoracic aorta was isolated for harvesting VECs with collagenase. One half of the harvested VECs were processed for real-time quantitative RNA analysis. The other half of the harvested VECs were stained for MIF, harvested and observed with optical microscope.

Results In the EECP group, the expression of MIF was significantly lower than in the other two groups (p=0.002). The expression of MIF was significantly lower in the EECP group than in the other two groups (p=0.001). In the EECP group, the distribution of SNP3 (rs3890011) in CYP4A11 gene was associated with CAD in a Han population of China. The G-G-T haplotype could be a useful genetic marker of CAD in a Han population of China. There is no association between the 4 SNPs (rs9332978, rs4660980, rs3890011, rs1126742) of the CYP4A11 gene and CAD in a Uygur population of China.

GW23-e1395 HAPLOTYPE STUDY OF THE CYP4A11 GENE AND CORONARY ARTERY DISEASE IN A HAN AND A UYGUR POPULATION OF CHINA
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Objectives CYP4A11 (cytochrome P450, family 4, subfamily A, polypeptide 11) converts arachidonic acid to 20-hydroxyecosatetraenoic acid (20-HETE), which plays a crucial role in the modulation of cardiovascular homeostasis. The aim of the present study was to assess the association between the human CYP4A11 gene and coronary artery disease (CAD) in a Han and a Uygur population of China.

Methods In a Han population, 361 CAD patients and 315 controls were genotyped for 4 single-nucleotide polymorphisms (SNPs) of the human CYP4A11 gene (rs9332978, rs4660980, rs3890011, rs1126742). In a Uygur population, 331 CAD patients and 182 controls were genotyped for the same 4 SNPs. The data were assessed via a haplotype-based case–control studies.

Results In a Han population, the distribution of SNP3 (rs3890011) genotypes showed a significant difference between CAD and control subjects (p=0.030), the distribution of the recessive model of SNP5 (GG vs CC+GC) was significantly higher in CAD patients than control subjects (p=0.011), the significant difference was retained after adjustment for covariates (95% CI: 1.137–2.423, p=0.009). Three SNPs (SNP1, SNP3, SNP4) were located in one haplotype block, and the overall distribution of haplotypes constructed with these SNPs was significant (p=0.023). The G-G-T haplotype in CAD was significantly higher than that in control group (p=0.037). In a Uygur population, neither the distribution of genotypes and alleles for the 4 SNPs showed significant difference nor the distribution of haplotypes constructed with the same three SNPs between CAD and control subjects.

Conclusions GG genotype of rs3890011 in CYP4A11 gene is associated with CAD in a Han population of China. The G-G-T haplotype could be a useful genetic marker of CAD in a Han population of China. There is no association between the 4 SNPs (rs9332978, rs4660980, rs3890011, rs1126742) of the CYP4A11 gene and CAD in a Uygur population of China.
performed on paraffin-embedded VECs, while RT-PCR was applied for detecting the transcriptional expression of MIF, respectively.

**Results** The staining-positive rate of MIF of aortic VECs in ECP group was much lower than that in HC group (211±14)% vs (358±26)% in normal group significantly (211±14)% vs (168±22)% in normal group, p<0.05. In consistence with the result of immunochemical staining analysis, the relative ratio of RT-PCR products of MIF were lower in ECP group than that in HC group ((1.26±0.15) vs (1.89±0.22), p<0.05), but still higher than that in normal group significantly ((1.26±0.15) vs (0.65±0.11), p<0.05). The immunocytochemical expression of MIF correlated positively to its relative ratio of RT-PCR products (r=0.662, p<0.05).

**Conclusions** MIF in VECs may play an important role in atherogenesis. Transcriptional downregulation of MIF in VECs may be one of the molecular mechanisms contributing to the clinical outcomes following ECP preformation.

**GW23-e1818 SEMEN CASSIAE EXTRACT REDUCES MYOCARDIAL ISCHAEMIA AND REPERFUSION INJURY IN TYPE 2 DIABETIC BUT NOT NORMAL RATS**

**Objectives** Patients with type 2 diabetes mellitus (DM), which is characterised by hyperlipidaemia, are liable to more severe and fatal myocardial infarction. Semen Cassiae is proved to reduce serum unsaturated fatty acids levels. This study was to investigate whether the Semen Cassiae extract reduces myocardial ischaemia and reperfusion (MI/R) injury, and if so, to further study the underlying mechanisms.

**Methods** The high-fat diet-fed streptozotocin (HFD-STZ) rat model (type 2 DM model) was developed. Age- and gender-matched normal and DM rats were given the extract mixed into the fodder of the concentration of 50 g crude herbal medicine/kg BW for 14 days. Subsequently these animals were subjected to 30 min of myocardial ischaemia and 4 h of reperfusion.

**Results** Compared with the normal control, DM rats showed significantly increased plasma total cholesterol (TC, 4.63±0.10 mmol/l vs 1.57±0.13 mmol/l, n=8, p<0.05) and triglyceride (TG, 1.13±0.15 mmol/l vs 0.68±0.09 mmol/l, p<0.05). This model also had more severe MI/R injury and cardiac functional impairment. Feeding DM rats with Semen Cassiae extract significantly reduced the plasma TC (2.10±0.33 mmol/l), TG (0.76±0.18 mmol/l), improved the instantaneous first derivation of left ventricle pressure (+LV dP/dt max) and (−LV dP/dt max) (2854±96) and (−2343±86) mm Hg/s vs (2686±87) and (−2343±86) mm Hg/s in DM group, n=8, and reduced infarct size ((42.36±9.17)% vs (56.44±10.43)%), plasma creatine kinase and lactate dehydrogenase activities, and apoptotic index ((58.2±7.3)% vs (64.3±6.7)% at the end of reperfusion (all p<0.05). Moreover, Semen Cassiae extract treatment also increased the antiapoptotic protein Akt and ERK1/2 expression and phosphorylation levels (n=5, p<0.05). Pretreatment with a PI3K inhibitor wortmannin (1.4 mg/kg, i.p., 15 min before ischaemia) or an ERK1/2 inhibitor PD98059 (5 mg/kg, i.p., 15 min before ischaemia) significantly blocked Akt and ERK1/2 phosphorylation respectively and both inhibited the cardioprotective effects induced by Semen Cassiae extract feeding. However, Semen Cassiae extract treatment did not show any effect on the plasma TC/TG levels and MI/R injury in the normal rats.

**Conclusions** Our data suggest that Semen Cassiae extract effectively improves myocardial function and reduces MI/R-induced injury (including apoptosis) in diabetic but not normal rats, which is possibly attributed to the reduced TC/TG levels and the triggered cell survival signalling Akt and ERK1/2.

**GW23-e1843 REGULATION OF TRANSFORMING GROWTH FACTOR β1 SIGNALLING IN THE POST-ISCHAEMIC MOUSE HEART**

**Objectives** eNOS-derived NO induces acute phase tissue hypoxia in vivo and hyperoxia induces fibroblast trans-differentiation in vitro. However, little is known about the effect of reperfusion-induced hypoxia on myocardial infarct healing. The current study is to determine how late phase reperfusion hypoxia and NO regulate cardiac myofibroblast formation.

**Methods** C57BL/6 wild-type, eNOS−/− and iNOS−/− mice were subjected to 30-min LAD occlusion followed by 14-days of reperfusion. Myocardial tissue PO2 was monitored with electron paramagnetic resonance oximetry. Protein expression of TGF−β1, p-Smad2/3, t-Smad2/3, p21 and α-SMA were measured with ELISA and western blot.

**Results** There was an acute phase overshoot of tissue PO2 in the WT and iNOS−/− but not eNOS−/− mice. After 60 min reperfusion, tissue hypoxia was observed in all three groups and peaked at day 3 with significantly lower PO2 in the eNOS−/− mice than that in the WT and iNOS−/− mice (22.4±0.8 vs 39.8±1.13 and 26.9±1.3 mm Hg). Protein expression of the total and active TGF−β1, p-Smad2/3 vs t-Smad2/3 ratio, p21 and α-SMA were significantly increased after reperfusion in the WT mice. Knockout of eNOS or iNOS further increased the expression of these signals. Immunohistochemical staining indicated the expression of α-SMA in the infarct area. Immunoprecipitation demonstrated the nitration of TGF−β1 receptor II. Carbogen (95% O2+5% CO2) treatment increased the expression of p-Smad2/3 over t-Smad2/3 ratio, p21 and α-SMA were signiﬁcantly increased after reperfusion in the WT mice. Knockout of eNOS or iNOS further increased the expression of these signals. Immunohistochemical staining indicated the expression of α-SMA in the infarct area. Immunoprecipitation demonstrated the nitration of TGF−β1 II. Carbogen (95% O2+5% CO2) treatment increased the expression of p-Smad2/3 over t-Smad2/3 ratio, which was inhibited by EUK134 (10006329 EUK 134) and sodium nitroprusside.

**Conclusions** Late phase reperfusion tissue hypoxia promoted while eNOS/iNOS-derived NO/ONOO− inhibited cardiac TGF−β1 signalling and myofibroblast trans-differentiation. These ﬁndings may provide new targets to improve myocardial infarct healing and repair.
Methods MSCs derived from rats was treated with HDL in different concentration or for different periods. The proliferation of MSCs was measured with MTT and BrdU assay. The expressions of p21 and phosphorylation of Akt, ERK1/2 were evaluated by western blot. The activity of pathways was down-regulated by the respective specific inhibitor, and the gene of Scavenger Receptor-B Type I (SR-BI) was knocked down by RNA interference.

Results We found that HDL promoted MSCs proliferation in a time- and concentration-dependent manner, in which the phosphorylation of Akt, ERK1/2 were up-regulated and the level of p21 was down-regulated. When MSCs was preconditioned with the specific inhibitor to respective pathways, the decrease of p21 induced by HDL was significantly attenuated compared with that without preconditioning (LY294002: 1.03±0.16 vs 0.69±0.13, p<0.05; U0126: 1.68±0.17 vs 0.75±0.15, p<0.05). SR-BI contributed to HDL-induced proliferation of MSCs, which was effectively abolished by the knock-down of SR-BI. Compared with respective PBS-treatment groups, MSCs transfected with mock siRNA displayed a higher BrdU incorporation rate after administration of HDL (0.98±0.16 vs 1.57±0.23, p<0.05), while the MSCs transfected with SR-BI siRNA showed no change (1.08±0.15 vs1.08±0.14, p > 0.05).

Conclusions HDL improves the proliferation of MSCs in a time- and concentration-dependent manner through PI3K/Akt and MAPK/ERK1/2 pathways and binding SR-BI receptor.

GW23-e2588 EFFECT OF IRBESARTAN ON THE BURDEN OF ATRIAL FIBRILLATION IN THE HYPERTENSIVE PATIENTS WITH BRADYCARDIA-TACHYCARDIA SYNDROME UNDERGOING CARDIAC PACEMAKER IMPLANTATION

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Objectives To evaluate the effect of irbesartan, an angiotensin-receptor blocker, on the prevention of paroxysmal atrial fibrillation in the hypertensive patients with sick sinus syndrome and paroxysmal atrial fibrillation.

Methods 536 patients diagnosed with hypertension, sick sinus syndrome and paroxysmal atrial fibrillation were prospectively enrolled. After implanted with dual-chamber pacemakers, they were randomly divided into two groups according to their treatments to hypertension were irbesartan (Gi, n=189) or nifedipine (Gn, n=347). The patients were followed up for one year, the maximum P wave duration (Pmax), the P wave dispersion (Pd), the total burden of atrial fibrillation were estimated, and the results were statistically analysed and compared between two groups.

Results The basic clinical characteristics of two groups, including echocardiographical parameters, were comparable. One year later, no significant differences in the mean reduction both in systolic and in diastolic blood pressure were found in two groups, and the differences of Pmax were not remarkable too(122±7.6 ms vs 124 ±8.1 ms, p>0.05). However, the increase of Pd in Gi was statistically lower than that in Gn (26.5±4.5 ms vs 32.1±5.2 ms, p<0.05). Moreover, though echocardiograms demonstrated that there were no apparently differences in left ventricular end-diastolic volume (LVEDV), left ventricular end-systolic volume (LVESV) and left ventricular ejection fraction (LVEF) in two groups, the diameters of right atrium (RA) and left atrium (LA) in Gi were significantly smaller than that in Gn (RA: 25.2±3.6 mm vs 27.5±4.3 mm, LA: 33.8±4.2 mm vs39.5±5.1 mm, p all<0.05). Compared with those in Gn, the frequencies of AMS in Gi decreased more sharply (202 ±45 times vs 162±48 times, p<0.05), the duration of AMS shortened more apparently (291±68 h vs 212±72 h, p<0.05), the total burden of atrial fibrillation eased more obviously (25.8±5.3% vs. 24.2±4.3%, p<0.05).

Conclusions Irbesartan, a conventional treatment to hypertension, additionally contributes to coordinate the anisotropy of double atrial depolarization, shortens the duration of atrial fibrillation, consequently leading to reducing the total burden of atrial fibrillation.
improvement in the treatment group compared to the control group. A significant improvement in myocardial perfusion was noted in the treatment group compared to the control group, as measured by single-photon emission CT.

Conclusions This randomised trial investigating intracoronary infusion of autologous CD34+ cells in patients with intractable angina shows the safety and feasibility of this therapy and provides evidence for efficacy.

GW23-e2574 OLMESARTAN AMELIORATES LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN SPONTANEOUSLY HYPERTENSIVE RATS THROUGH INHIBITING CALCINEURIN

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Objectives To test whether treatment of olmesartan ameliorates cardiac diastolic dysfunction in spontaneously hypertensive rats (SHR) and whether this is calcineurin (CaN) involved.

Methods Two groups of 6-month-old male SHR were treated with either saline (n=6) or olmesartan (2.5 mg kg<sup>-1</sup> day<sup>-1</sup>, n=6) for 3 months. Age matched Wistar–Kyoto rats (WKY, n=6) were also served as controls. Heart rate (HR), systolic blood pressure (SBP), fractional shortening (FS) and contractile function, histological examinations and expression of CaN were all determined.

Results SHR of 6 months old exhibited evident cardiac hypertrophy and diastolic dysfunction as demonstrated by elevated systolic blood pressure, increased left ventricular mass index and decreased E/A and E’/A’ while systolic function assessed by ejection fraction (EF) and fractional shortening (FS) remained unimpaired when compared with WKY controls. Treatment with olmesartan significantly decreased systolic blood pressure and ventricular hypertrophy, attenuated fibrosis and improved diastolic function in olmesartan group compared to saline (p<0.05). Meanwhile, CaN expression was also downregulated after treatment in olmesartan group compared to saline group as compared with that in the control group. Notch2 and Notch3 expressions decreased slightly, not statistically significant. Ligands in DIL4 and Jagged1 expression were significantly elevated (p<0.05), the expression of DIL1 mildly elevated, DIL3 and Jagged2 expressions decreased slightly, not reached statistical significance. Detected Notch receptors expression by Western-blot, we found that Notch1 expression was significantly elevated, Notch4 not change, Notch2 and Notch3 decreased. With different concentrations of ox-LDL stimulation of macrophage Notch1, DIL4 and Jagged1 expression were elevated (p<0.05), the effect on the concentration of 50 mg/l increased the most obviously. At different time points after ox-LDL stimulation of macrophage Notch1, DIL4 and Jagged1 expression were elevated (p<0.05), the biggest observed in concentration of 50 mg/l. Screening out TLR2siRNA-1 can appear obvious silencing effect on the ox-LDL was got at concentration of 50 mg/l. Meanwhile, CaN expression was also downregulated after treatment in olmesartan group as compared with the other two groups (both p<0.05).

Conclusions Our data suggest that the beneficial effect of olmesartan on cardiac structure and diastolic function may be, to some extent, through CaN pathway.

GW23-e2601 THE EFFECT OF OXIDISED LOW-DENSITY LIPOPROTEIN ON NOTCH

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Objectives To explore the expression of Notch signal and cytokines by oxidised low-density lipoprotein (ox-LDL) in macrophages of human acute monocytic leukaemia cell line (THP1) and to search for possible mechanism of atherosclerosis (AS).

Methods Human macrophage from THP1 transform by phorbol 12-myristate 13-acetate (PMA) was cultured with final concentration of 50 mg/l ox-LDL for 6 h. Four receptors and four ligands of Notch signalling pathway were inspected. Dynamic changes in terms of cell shape were observed by phase contrast microscopy. Notch1, DIL4 and Jagged1 were given to 25 mg/l, 50 mg/l, 100 mg/l of three different concentrations of ox-LDL stimulation for 48 h. The best concentration was 50 mg/l. Real-timePCR (RT-PCR) detection of Notch1, DIL4 and Jagged1 mRNA expression levels of different time points after macrophages co-cultured with 50 mg/l ox-LDL for 0h, 3 h, 6 h, 12 h, 24 h, 48 h. Notch1, DIL4 and Jagged1 protein expressions were determined by western-blot of different concentrations and different time points. Vascular cell adhesive molecule-1 (VCAM-1) and monocyte chemotactistant protein-1 (MCP-1) expression were determined by enzyme-linked immunosorbent assay (ELISA). Lipofectamine2000 transfection, Toll-like receptor 2 small interfering RNA (TLR2siRNA) which silence effect was obvious on THP-1 derived macrophages for 24 h. Macrophages with TLR2siRNA transfection previously co-cultured ox-LDL 50 mg/l for 48 h. RT-PCR were used to detect the blank control group and transfection of TLR2siRNA group Notch1, DIL4 and Jagged1 and the expression of inflammatory factor VCAM-1, MCP-1. Western blotted and ELISA detection of Notch1, DIL4, Jagged1, VCAM-1 and MCP-1 protein expressions respectively.

Results Macrophages which induced by different concentrations of ox-LDL for 48h occurred dendritic-like cell (DC) shape change. Compared with the control group DC shape change ratio was significantly increased (p<0.05), 50 mg/l concentration effect was the highest. Macrophages joining ox-LDL stimulated of Notch1 expression was significantly elevated (p<0.05) compared to control group. Notch2 and Notch3 expressions decreased slightly, the expression of Notch4 increased slightly, but not statistically significant. Ligands in DIL4 and Jagged1 expression were significantly elevated (p<0.05), the expression of DIL1 mildly elevated, DIL3 and Jagged2 expressions decreased slightly, not reached statistical significance. Detected Notch receptors expression by Western-blot, we found that Notch1 expression was significantly elevated, Notch4 not change, Notch2 and Notch3 decreased. With different concentrations of ox-LDL stimulation of macrophage Notch1, DIL4 and Jagged1 expression were elevated (p<0.05), the effect on the concentration of 50 mg/l increased the most obviously. At different time points after ox-LDL stimulation of macrophage Notch1, DIL4 and Jagged1 expression were elevated (p<0.05), the biggest observed in concentration of 50 mg/l. Screening out TLR2siRNA-1 can appear obvious silencing effect on the Notch1, DIL4 and Jagged1 expression with RT-PCR, western-blot and ELISA increased significantly suppressed in the transfection of siRNA group which THP-1 derived macrophages transfection by application of Lipofectamine2000, the expression of inflammatory factor VCAM-1 and MCP-1 was elevated significantly suppressed. Conclusions Our data showed that with ox-LDL challenge the expressions of Notch1, DIL4, Jagged1 and the levels of VCAM-1, MCP-1 significantly increased in macrophages in a dose-time-dependent manner within some extent compared with that in the control group. Notch signal and TLR2 pathways had synergistic expression effect. Notch signalling was activated by ox-LDL stimulation and may partially mediate atherogenic effect macrophage functions.

GW23-e2399 THE EFFECTS OF COMBINED AMLODIPINE AND ATORVASTATIN ON THE BALANCE OF ACTIVATED RANKL/RANK/OPG SYSTEM IN SHR

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Objectives Introduction To explore the effect of amldipine, atorvas-

E43
system, by investigating the changes of RANKL, RANK and OPG expression in SHR.

**Methods** 36-week-old SHR were randomly allocated into four groups: a vehicle-treated control group; an amlodipine (10 mg/kg/day)-treated group; an atorvastatin (10 mg/kg/day)-treated group; and a group treated with a combination of amlodipine and atorvastatin (both at 10 mg/kg/day). In addition, WKY rat was chose as control group of normal blood pressure. Drugs were administered by oral gavage every morning for a period of 12 weeks before hearts were harvested for analysis. Left ventricular mass index (LVMI) was assessed by morphology measurement. Western blot and RT-PCR was used to observe the protein and gene expression of RANKL, RANK and OPG.

**Results** LVMI in SHR was higher than that in WKY, and treatment with amlodipine or atorvastatin significantly decreased LVMI (each p<0.05). Furthermore, combination therapy had the best lowering effect (p<0.05). Western Blot and RT-PCR showed the protein and mRNA expression levels of RANKL and RANK as well as OPG in SHR control group were all obviously increased in contrast to that in WKY (each p<0.05). The protein and mRNA expression levels of RANKL and RANK in either amlodipine or atorvastatin alone groups were obviously reduced compared with that in SHR control group (each p<0.05). Furthermore, combination therapy reduced it further (each p<0.05). The protein and mRNA expression levels of OPG in either amlodipine or atorvastatin alone groups were obviously reduced compared with that in SHR control group (each p<0.05), but there was no difference among three different treatment (p>0.05).

**Conclusions** Both protein and mRNA expression of RANKL, RANK, and OPG in SHR were significantly enhanced compared with WKY, suggesting that the pathologic changes of ventricular remodelling may be associated with the activation of RANKL/RANK/OPG system. Amlodipine and atorvastatin may obviously reverse advanced cardiac hypertrophy by way of down regulation of the activated RANKL/RANK/OPG system.

**GW23-e0430** LUTEOLIN LIMITS INFARCT SIZE AND IMPROVES CARDIAC FUNCTION AFTER MYOCARDIUM ISCHAEMIA/

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**Objectives** The present study was to investigate the effects and mechanism of Luteolin on myocardial infarct size, cardiac function, and cardiomyocyte apoptosis in diabetic rats with myocardial ischaemia/reperfusion (I/R) injury.

**Methods** Diabetic rats underwent 30 min of ischaemia followed by 3 h of reperfusion. Animals were pretreated with or without Luteolin before coronary artery ligation. The severity of myocardial I/R induced LDH release, arrhythmia, infarct size, cardiac function impairment, cardiomyocyte apoptosis were compared. Western blot analysis was performed to elucidate the target proteins of Luteolin. The inflammatory cytokine production were also examined in ischaemic myocardium underwent I/R injury.

**Results** Our results revealed that Luteolin administration significantly reduced LDH release, decreased the incidence of arrhythmia, attenuated myocardial infarct size, enhanced left ventricular ejection fraction and decreased myocardial apoptotic death compared with I/R group. Western blot analysis showed that Luteolin treatment up-regulated anti-apoptotic proteins FGR2 and LIF expression, increased BAD phosphorylation while decreased the ratio of Bax to Bcl-2.

**Conclusions** Luteolin treatment also inhibited MPO expression and inflammatory cytokine production including IL-6, IL-1β and TNF-α. Moreover, co-administration of Wortmannin and Luteolin abolished the beneficial effects of Luteolin.

**GW23-e0507** POLY(ADP-RIbose) POLYMERASE INHIBITOR REDUCES HEART ISCHAEMIA/REPERFUSION INJURY VIA INFLAMMATION AND AKT SIGNALLING

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**Objectives** To compare the clinical effects of VVI and DDD pacing in sinus bradycardia in patients after valve replacement.

**Methods** All 29 patients with sinus bradycardia after valve replacement were divided into two groups by different pacing-mode. DDD group (n=17), VVI group (n=12). Mean follow-up was 28 months; Follow up the changes of left ventricular ejection fraction, fractional shortening and the size of atrial ventricular. The persistency atrial fibrillation, the lower ratio of the hospitalisation for heart failures and improve the cardiac structure and function.
activation of PARP transcription factor nuclear factor-kappaB (NF-kB), intercellular adhesion molecule-1 (ICAM-1), cyclooxygenase-2 (COX-2) and Matrix metalloproteinase-9 (MMP-9) were evaluated during the I/R protocol.

Results Our data showed that DPQ could reduce the rat heart I/R injury in vivo. Heart I/R caused a significant increase in PARP activity. Administration of DPQ could decrease the activation of PARP. At the same time, administration of DPQ could decrease myocardial infarction size from 60.97±4.22% to 39.03±3.94% (p<0.05) and cells apoptosis from 35±5.3% to 20±4.1% (p<0.05) and simultaneously improved the cardiac function. In addition, we found that DPQ reduced the expression of NF-kB, ICAM-1, COX-2 and MMP-9 in rat heart. At the same time, DPQ facilitated Akt activation and decreased the activity of its downstream target, glycogen synthase kinase-3β (GSK-3β) and the forehead transcription factorFOXO3a.

Conclusions Our results suggested that the inhibition of PARP was able to reduce heart I/R injury. The protective effects of DPQ were associated with both inflammation and Akt signalling.

GW23-e0630  HIGH DENSITY LIPOPROTEIN INHIBITS MECHANICAL STRESS-INDUCED CARDIAC HYPERTROPHY THROUGH DOWNREGULATION OF ANGIOTENSIN II TYPE 1 RECEPTOR

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Objectives This study is designated to investigate whether HDL inhibits cardiac hypertrophy induced by mechanical stress and whether HDL inhibits AT1 receptor.

Methods Ten-week old male mice were subjected to transverse aortic constriction for 2 weeks and were monitored for changes in cardiac structure and function by echocardiography. Hearts were collected 2 weeks after surgery for molecular and histological analyses. In addition, cultured cardiac myocytes were exposed to mechanical stresses for 2 weeks and for 48 h at in vivo and in vitro levels, respectively, resulted in marked cardiac hypertrophic responses including increased protein synthesis, enlarged sizes of cardiomyocytes and hearts, upregulated phosphorylation levels of protein kinases and reprogrammed expression of specific genes, all of which were significantly attenuated by the treatment with HDL. Furthermore, mechanical stress induced upregulation of AT1 receptor expression either in cultured cardiomyocytes or in hearts of mice and HDL significantly suppressed the upregulation of AT1 receptor.

Conclusions Our results suggest that HDL inhibited mechanical stress-induced cardiac hypertrophy through downregulation of AT1 receptor expression.

GW23-e1790  THE MOSAICISM GENETIC PATTERN FOR TIMOTHY SYNDROME WITH CACNA1C MUTATION G406R

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Objectives Timothy syndrome (TS), also known as LQT3, is a rare and severe form of Long QT syndrome (LQTS) and most patients are caused by the CACNA1C mutation, G406R. So far only 32 cases of TS have been reported. TS affects multiple systems and is characterised by malignant arrhythmias, syndactyly, immunodeficiency, intermittent hypoglycaemia, developmental delay, autism and evident facial features, while the arrhythmias being the major cause of death. Mosaicism signifies the presence of genetically distinct populations in the somatic and germline tissues, with tissue-to-tissue variations that may not follow Mendelian rules of inheritance. This study aimed to investigate the genotype and phenotypic characteristics of Chinese TS patients, and to determine whether mosaicism exists in Chinese TS patients.

Methods A 2-year-old girl with typical TS1 phenotypes was enrolled in Chinese National Channelopathy Register Study. Blood and oral mucosa samples of the family members and the father’s sperm samples, as well as clinical data were obtained under written consents. A QTc (QT interval corrected by heart rate) >450 ms for male or >470 ms for female was considered to be QT prolongation. Mutational screening of CACNA1C gene was

GW23-e1177  ROSUVASTATIN COULD MODULATE INSULIN SIGNALLING AND INHIBIT ATHEROSCLEROSIS

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Objectives To provide evidence that rosuvastatin could improve insulin-resistance and inhibit atherosclerosis by modulating insulin signalling, and whether this effect beyond its plasma cholesterol-lowering effect.
performed via PCR and direct DNA sequence analysis. Genotype-phenotype evaluation was also performed for family members. Mutational analysis were based on NCBI standardised mRNA sequence (NM_000719.6). Specific primers for exon 8A was designed to amplify the mutated allele. Cloning sequencing and fluorescence quantitative PCR technique were performed to determine the quantitative distribution of mutant allele in suspected carriers of family members.

**Results** The baseline ECG of this infant showed markedly prolonged QTc of 580 ms, intermittent 2:1 AV block (AVB) and macro T wave alternans (TWA). Holter monitor revealed R-on-T extrasystoles during bradycardia when 2:1 AVB was present. The proband showed a typical TS1 with complete bilateral syndactyly of 2-3-4-5 fingers and cutaneously syndactyly of 2-3 left toes, a patent ovale foramen and delayed language learning skills. Candidate gene search identified G406R (1216G>A) on CACNA1C. The proband’s father has congenital syndactyly, a mildly prolonged QTc at 470-490 ms and no other development retardations except for a slightly delayed language development at early age, indicating an atypical TS. Analysis of the family members’ peripheral blood and oral mucosa DNA sample showed no abnormality, except for the presence of a minor ‘A’ peak in her father’s DNA samples. The test with specific primers showed the ‘A’ rather than the ‘G’ signal at nucleotide 1216, confirming the somatic mosaicism in the father’s three types of DNA samples. Via cloning sequencing technique, we found that approximately 22.2% (5 clones out of 45 colonies) of the oral mucosa cells carried the mutant allele in proband’s father, his blood 17.02% (4 clones out of 47 colonies) and sperm 3.75% (3 clones out of 80 colonies).

**Conclusions** The present study is the first report of calcium channel mutation causing LQTS in Chinese patients. In addition, we have found a rare inherited pattern—mosaicism genetic pattern—in this TS family, indicating that an individual with mild phenotype may be a genetic mosaic and his child could have severe phenotype once inherited the mutated allele. This finding should give strong implication for considering the possibility of genetic mosaicism when gene screening shows a ‘De novo’ mutation in order to assist genetic counselling.

**GW23-e1760**

**THE BASIC STUDY OF REPROGRAMMING HUMAN POSTNATAL FORESKIN FIBROBLASTS INTO INDUCED PLURIPOTENT STEM CELLS IN VITRO**

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**Objectives** To establish the process of culturing primary human postnatal foreskin fibroblasts (hPFF) line and the hPFF were identified by Mitomycin C as feeder cells. Lentivirus vector which included the four genes as Oct4, Sox2, c-Myc, Klf4 infected hPFF to investigate the optimum condition of target gene over-expression lentivirus particle infecting hPFF which were reprogrammed into induced pluripotent stem cell in vitro.

**Methods** First: Using collagenase I digestion and tissue culture technique to separate and culture hPFF. Observing cells morphology under the inverted microscope, measuring cells viability by trypan blue assay, identify cells by immunocytochemical staining of Strept avidin-biotin complex (SABC). The Optional planting density of cell was determined according to the cellular growth curve detected by MTT colorimetric assay. The hPFF were identified by Mitomycin C as feeder cells. The optional concentration of mitomycin C and the time treating with mitomycin on MEFs were determined by MTT colorimetric assay;

Second: Using lentivirus particle expressing GFP infect hPFF observe fluorescence efficiency under the inverted microscope to get the best infecting condition and multiplicity of infection (MOI); Third: Randomly dividing hPFF in good condition into three groups: control group, lentivirus particle expressing GFP group, target gene infected group, lentivirus vectors consecutively infect hPFF After four days, giving hPFF condition of stem cells culture, observing the morphological changes and Raman spectroscopy analyse three group cells spectral configuration to get the best laboratory condition.

**Results** First: 0.025% collagenase I digestion and tissue culture technique could find stable hPFF lines in vitro. cells began to migrate from tissue after five days, showed shuttle shape and had arms, after seven days, major free cells began to form and binding, after ten days, cells overspread the bottom, 0.25% trypic finished digestion and passed. The identified result was right by immunocytochemical staining of Strept avidin-biotin complex. hPFF proliferation could be efficiently repressed after being treated with mitomycin C 10 μg/ml for 3.5 h or 15 μg/ml for 2.5 h and the quantity of hPFF could maintain at least for 1 week; Second: fishing out the best infecting multiplicity of infection was 40 in our laboratory condition. Third: in the same infection condition, compared with control group, morphology in lentivirus particle expressing GFP group were no obvious observed change under the inverted microscope, but cells in target gene infected group were different, changing from shuttle to spherical in morphology, spectral configuration was no obvious discrepancy between control group and lentivirus particle expressing GFP group by Raman spectroscopy, however cell spectral configuration of target gene infected group was different.

**Conclusions** The study successfully primary cultured hPFF established hPFF lines in vitro and attained highly effective feeder layer cells. hPFF can be infected by target gene over-expression lentivirus particle and four target gene over- expression lentivirus particle were mainly factors that leded cells change in morphology.

**GW23-e1660**

**FOLIC ACID PREVENTS LINE-1 HYPMETHYLATION IN RATS WITH HYPERHOMOCYSTEINEMIA**

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**Objectives** LINE-1 (Long Interspersed Nuclear Elements-1) hypomethylation has been associated with risk of cardiovascular disease. Increased plasma homocysteine (Hcy) is an independent risk factor for cardiovascular disease. However, it is still unclear whether plasma Hcy can be approached as a modifiable risk factor for atherosclerosis, since the results regarding the effect of Hcy-lowering treatment on cardiovascular risk are contradictory. Our study was designed to determine whether Hcy is associated with LINE-1 hypomethylation and whether folic acid supplementation can prevent this process in rats with hyperhomocysteinemia (HHcy).

**Methods** 36 healthy 6-week-old Wistar male rats, weighing (160 ±10 g), after being fed adaptable for one week, were randomly divided into control group (n=12), HHcy group (n=12), folic acid treatment group (n=12). The control group was fed with AIN-93G
diet. The Hhcy group was fed with high-methionion diet, consisting of AIN-93G diet plus 1.7% methionion. The folic acid treatment group was fed with high-methionion plus folic acid-rich diet, consisting of AIN-93G diet plus 1.7% methionion and 0.008% folic acid. After be maintained for 18 weeks on the previously described diets, the Hcy and folic acid concentrations in the plasma was measured with the IMX assays. The thoracic aorta was harvested for morphology (electron microscopy). The DNA methyltransferase activity was determined using EpiQuik DNA Methyltransferase (DNMT) Activity/Inhibition Assay Kit. The methylation status of LINE-1 was assessed by the combined bisulphite restriction analysis (COBRA) method.

**Results**

- A high methionine diet for 18 weeks is sufficient to induce Hhcy. Folic acid supplementation to the rats fed with the high-methionine diet prevented an elevation Hcy levels in the plasma (p<0.01) and morphological changes in the thoracic aorta. Compared with the Control group, the Hhcy group had decreased DNA methyltransferase activity and LINE-1 methylation status (p<0.01, p<0.05). After folic acid supplementation, the lowering of Hcy levels was accompanied by a marked elevation of DNA methyltransferase activity and LINE-1 methylation status in aorta (p<0.05, p<0.05).

**Conclusions**

Our findings indicate that folic acid supplementation prevents LINE-1 hypomethylation in rats with Hhcy.

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**GW23-e2448**

**POLYMORPHISMS OF HSPB7 GENE ASSOCIATE WITH IDIOPATHIC DILATED CARDIOMYOPATHY SUSCEPTIBILITY IN A CHINESE POPULATION**

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**Objectives**

Dilated cardiomyopathy (DCM) is characterised by ventricular chamber enlargement and systolic dysfunction with normal left ventricular wall thickness. The pathogenesis of DCM has been extensively investigated for many years, but it remains uncertain. HSPB7 gene has been previously found to be associated with DCM. To assess the role of HSPB7 in DCM, we examined 11 single nucleotide polymorphisms (SNPs) in HSPB7 and ACTA1 gene, namely, rs 525720, rs 533021, rs 589759, rs 670957, rs 7597985, rs 2070664, rs 3759834, rs 10927875, rs 1570154, rs 7523558 and rs 6660685.

**Methods**

A total of 97 DCM patients and 189 controls were included in the study, and all SNPs were genotyped by matrix assisted laser desorption/ionisation time-of-flight mass spectrometry (MALDI-TOF-MS).

**Results**

- showed that the genotype of SNP rs 10927875 (2=4.301, p=0.002; OR=0.1926, 95% CI=0.037–1.002) had association with DCM in Chinese population.

**Conclusions**

The results suggest that HSPB7 polymorphisms appear to play an important role in the susceptibility of DCM in Chinese population.

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**GW23-e2120**

**VASCULAR EXTRACELLULAR MATRIX (ECM) REMODELLING INDUCED BY LEPTIN COULD BE ANTAGONISED BY ADIPONECTIN THROUGH THE ACTIVATION OF AMPK VIA ADIPOPI1 OF VECS IN 3D VESSEL MODEL**

Zhi Zhang, Guang Chu, Bao-Gui Sun, Qiu-Yan Dai. Shanghai Jiao Tong University School of Medicine

**Objectives**

Observe in 3D vessel model whether Leptin could increase the expression level of collagen II / IV and TIMP-1 or reduce that of MMP-2/-9 in HUASMCs (human umbilical artery vascular smooth muscle cells), whether Adiponectin could antagonise the above changes; whether AMPK pathway was activated via Adiponectin receptor 1 (AdipoR1) in the endothelial cells and then SOCS-3 (suppressor of cytokine signalling 3) was promoted to inhibit phosphorylation of STAT3.

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**Contributors**

Zheng Zhang, Haichang Wang. Department of Cardiology, Xijing Hospital, Fourth Military Medical University

**Objectives**

This study was designed to investigate the role of IP7 in I/R injury and to test the hypothesis that down-regulating IP7 gene expression protects against I/R injury.

**Methods**

Male Sprague-Dawley rats were subjected to 30 min of cardiac arrest followed by 90 min of reperfusion. The IP7 production contribute to myocardial ischaemia-reperfusion injury.

**Results**

- IP7 production significantly attenuated myocardial infarct size, enhanced left ventricular ejection fraction and decrease of myocardial apoptotic cells.

**Conclusions**

Our findings indicate that folic acid supplementation prevents LINE-1 hypomethylation in rats with Hhcy.
Methods 3D vascular models built by HUVECs (human umbilical vein endothelial cells) and HUASMCs were divided into three groups: control, Leptin group, Leptin+Adiponectin group. Elisa was used to detect expression levels of collagen II / IV, TIMP-1 and MMP-2/-9 in HUASMCs. Real-time PCR was used to detect the gene transcription level among three groups. RNAi technology was used to inhibit the AdipoR1 and AdipoR2 expression in HUVECs then the antagonistic effects of adiponectin were re-examined. Western Blot was used to test the changes of p-AMPK/AMPK, p-STAT3 / STAT3 and SOCS-3 among three groups. Blocks such as Compound C, PD98059, Okadaic acid and SB202190 were used to confirm the signalling pathway involved in this process.

Results Leptin increased the expression level of collagen II / IV, TIMP-1 and reduced that of MMP-2/-9 (referred as Leptin-induced vascular ECM remodelling effect). When adiponectin was added, the above effect disappeared (p>0.05). Results of Real-time PCR were the same. Receptors of HUVECs could be effectively inhibited by AdipoR1-siRNA and AdipoR2-siRNA with inhibition rates of 71.53±1.45% and 74.89±1.12% (p<0.01). The antagonistic effect of adiponectin was diminished by the depression of AdipoR1 (p<0.01). Western blot showed that Leptin increase p-STAT3 level in HUVECs; adiponectin alone had no effect on the p-STAT3 level in HUVECs but adiponectin could inhibit Leptin-induced STAT3 phosphorylation. Adiponectin increased the level of p-AMPK in HUVECs and that of SOCS-3 in HUASMCs. Compound C could inhibit the antagonistic effect of adiponectin against leptin and also reduce the expression level of SOCS-3 promoted by adiponectin.

Conclusions Leptin could cause vascular ECM remodelling, characterised by increasing the collagen’s synthesis and inhibit its degradation. And STAT3 signal transduction pathway might be involved in it. As SOCS-3 was one of the inhibitors of phosphorylation of STAT3, Adiponectin might promote the expression of SOCS-3 through AMPK pathway via AdipoR1 receptor on HUVECs, and then exert the antagonistic effect on Leptin-induced vascular ECM remodelling. Adiponectin alone had no effect on vascular ECM remodelling, indicating that the antagonistic effect depending on the activation of STAT3 pathway by Leptin.

**GW23-e2526** DIAGNOSTIC VALUE OF 320-SLICE CT ANGIOGRAPHY IN CORONARY ARTERY STENOSIS: A META-ANALYSIS
doi:10.1136/heartjnl-2012-302920a.116
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Objectives To evaluate the diagnostic accuracy of 320-slice CT coronary angiography (320-SCTA) compared with the standard reference conventional coronary angiography (CCA) in the detection of significant coronary artery stenosis (≥50%).

Methods Relevant studies from December 2005 to April 2012 were systematically searched, reviewed and included according to appropriate criteria. Diagnostic accuracy of 320-SCTA was evaluated by the pooled results of per-segment, per-vessel, and per-patient analysis, respectively. Meta-regression was employed to explain study heterogeneity.

Results Twenty-eight studies were eligible for this study. In per-segment analysis (n=13351), pooled sensitivity, specificity, LR+, and LR− were 88.1% (95% CI, 86.5%–89.6%), 97.6% (95% CI 97.3% to 97.8%), 36.2% (95% CI 28.6 to 45.9) and 0.11 (95% CI 0.08 to 0.16), respectively. In per-vessel analysis (n=2085), the pooled outcomes of sensitivity, specificity, LR+, and LR− were 87.7% (95% CI 86.5% to 88.9%), 96.4% (95% CI 95.8% to 96.9%), 17.4 (95% CI 13.9 to 21.8), and 0.13 (95% CI 0.07 to 0.20), respectively. In per-patient analysis (n=1412), corresponding results were sequentially 98.5% (95% CI 98.1% to 99.0%), 95.4% (95% CI 94.2% to 96.4%), 17.4 (95% CI 13.9 to 21.8), and 0.13 (95% CI 0.07 to 0.20). The area under the summary receiver operating characteristic curve (AUC) in the per-segment, per-vessel, and per-patient analysis was 0.990, 0.983 and 0.960, respectively. Percentage of unassessable segments had significant influence on heterogeneity (p<0.05).

Conclusions The excellent diagnostic performance of 320-SCTA may enable it as an alternative to CCA for the detection of coronary artery stenosis.

**GW23-e2071** LONG-TERM AEROBIC EXERCISE INCREASES MYOCARDIAL PPARγ EXPRESSION IN SPONTANEOUSLY HYPERTENSIVE RATS
doi:10.1136/heartjnl-2012-302920a.115
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Objectives It is well known that cardiac insulin resistance exists in spontaneously hypertensive rats (SHR), which is attributable to decreased peroxisome proliferator-activated receptor-gamma (PPARγ) expression in myocardium. However, the effects of aerobic exercise (AE) on myocardial insulin sensitivity in SHR rats are largely unclear. Therefore, the present study aimed to determine the effects of 9-week swimming training on myocardial insulin sensitivity in SHR and the underlying mechanism, with the special focus on the role of exercise in myocardial PPARγ expression.

Methods 4-weeks-old SHR were randomly subjected to 9 weeks of either sedentary or freeloading swimming exercise (2 h/day, 5 d/week). Blood glucose, cardiac systolic/diastolic function and PPARγ protein kinase B (Akt) expressions in myocardium were determined at the end of exercise.

Results Compared with Wistar-Kyoto rats (WKY), whole body and myocardial insulin sensitivity decreased in SHR as manifested by increased fasting blood glucose (6.24±0.21 vs 5.18 ±0.19 mmol/l, n=6, p<0.05) and decreased insulin-induced cardiac function changes especially for±LVdp/dtmax respectively, which was partly attributable to decreased PPARγ expression in myocardium (0.72±0.08 vs 1.08±0.07, n=4, p<0.05). Moreover, 9-week swimming training not only attenuated the fasting blood glucose (5.54+0.16 vs 6.24±0.21 mmol/l, n=6, p<0.05) improved cardiac function and enhanced myocardial response to insulin in vivo in SHR, but also increased myocardial PPARγ and subsequent Akt expressions (1.18±0.12 vs 0.72 ±0.08, n=4, p<0.01 and 0.953±0.13 vs 0.514±0.14, n=4, p<0.05) in SHR.

Conclusions These data demonstrate that 9-week swimming training increased myocardial PPARγ and subsequent Akt expressions in SHR, which is partly involved in improved myocardial insulin sensitivity. The present findings also indicate that the decreased PPARγ expression and subsequent phosphatidylinositol 3-kinase (PI-3 kinase)/Akt signalling perhaps plays a causative role in the impaired inotropic response to insulin in SHR heart. Thus, AE emerges as an important choice in future SHR preclinical and clinic investigation.
THE EFFECTS OF CARDIAC RESYNCHRONISATION THERAPY ON INWARD RECTIFIER K⁺ CURRENT (IK1) IN DYSSYNCHRONOUS ISCHAEMIC HEART FAILURE

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Objectives To investigate the change in inward rectifier K⁺ current (IK1) in desynchronous ischaemic heart failure and the electrophysiological consequences of cardiac resynchronization therapy (CRT).

Methods The mode of desynchronous ischaemic heart failure of dogs was established by ablation of left bundle branch and ligation of left anterior descending artery (n=14). After CRT for 6 weeks (n=7), the myocytes of interventricular septal and anterior left ventricular wall were dissected and the whole cell membranous clamp was used to detect the IK1, and the hemodynamic and echocardiographic parameters were measured during the process.

Results The QRS intervals and the corrected QT durations in dys-synchronous ischaemic heart failure were prolonged compared with control (100±23ms vs 53±8ms, p<0.05; 433±46ms vs 378±32ms, p<0.05). CRT reduced the prolonged period of QRS and QTc in dys-synchronous ischaemic heart failure (75±11ms vs 100±23ms, p<0.05; 592±56ms vs 433±46ms, p<0.05). The peak inward IK1 densities in both interventricular septal and lateral myocyte in dys-synchronous ischaemic heart failure were reduced compared with control group (0.70±0.31 vs 1.60±0.28, p<0.05; 1.20±0.34 vs 1.75±0.31, p<0.05), and there was a significant difference in IK1 in dys-synchronous ischaemic heart failure between interventricular septal and lateral myocardium (0.70±0.31 vs 1.20±0.34, p<0.05). CRT restored partially these changes in IK1 induced by dyssynchronisation via increasing IK1 in both interventricular septal and lateral myocardium (1.50±0.30 vs 0.70±0.31, p<0.05; 1.65±0.39 vs 1.20±0.34, p<0.05) and reducing the difference in IK1 between interventricular septal and lateral myocardium in dys-synchronous ischaemic heart failure (1.50±0.30 vs 1.65±0.39, p<0.05).

Conclusions CRT reversed partially the IK1 remodelling in dys-synchronous ischaemic heart failure, whereby reduced the regional heterogeneity of IK1.

THE EFFECTS OF PERITONEAL COOLING ON INFAMMATION AFTER CARDIOPULMONARY RESUSCITATION IN RABBITS

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Objectives To explore the effects of different cooling methods on systemic inflammation after cardiopulmonary resuscitation (CPR) in New Zealand rabbits.

Methods Forty eight adult New Zealand rabbits were induced ventricular fibrillation by AC current and were resuscitated after cardiac arrest for 5 min. After restore of spontaneous circulation (ROSC), the rabbits were randomly divided into four groups according to the way of cooling methods, nomothermia group (NT), peritoneal cooling group (PC), surface cooling group(SC) and local cooling group(LC). The plasma concentration changes of tumour necrosis factor-α (TNF-α) and interleukin-6 (IL-6) were measured in each group at different time points before and after ROSC. Liver tissue were removed after ROSC 12h, the level of nuclear factor-KB (NF-xBp65) and (NF-xBp50) were tested by Western-Blot. The survival time was recorded and compared after ROSC 96 h. One-way ANOVA or Mann-Whitney rank was used to determine the statistical significance between two groups. LSD-t test for multiple comparisons, RxC test for ROSC comparisons.

Results The levels of plasma TNF-α concentration in PC group were inferior to NT group after ROSC, p value were 0.020, 0.010 and 0.014 at 24 h, 48 h and 72 h respectively. The TNF-α level in PC group was also inferior to SC and LC group after ROSC 72 h (PC: SC, p=0.020; PC: LC, p=0.042). The IL-6 levels in PC group were inferior to NT group after ROSC 12h, p value was 0.013, 0.03, 0.010 and 0.009 respectively. The concentrations of P65 and P50 in PC group were lower than those in other groups (p<0.05), while there were no differences between the other three groups. The average survival time was 19.5h, 57h, 37.5h, 21.5h in NT, PC, SC and LC group after ROSC respectively. (PC:NT, p=0.024; PC:SC, p=0.128; PC:LC, p=0.025, but SC:NT, p=0.319; SC:LC, p=0.266).

Conclusions The neotype peritoneal cooling could rapidly induce and maintain hypothermia, and decrease the peritoneal temperature quickly, thus inhibit liver NF-xB activation, reduce TNF-α and
IL-6 release, subsequently relieve systemic inflammation after ROSC and prolong rabbit survival time.

**GW23-e0527**

**μ-CALPAIN REGULATE CARDIOMYOCYTES APOPTOSIS VIA APOPTOSIS INDUCING FACTOR AND BID IN RAT HEART ISCHAEMIA/REPERFUSION INJURY**

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**Objectives** Heart I/R may exacerbate myocardial injury by the release of massive of reactive oxygen and nitrogen species. Calpain has been proposed to play a role in the pathogenesis of heart I/R injury. However, the underlying mechanisms are still not thoroughly understood. Here we investigated the effect of μ-Calpain on heart I/R injury and elucidated the underlying mechanisms.

**Methods** Studies were performed with I/R rats’ hearts. MDL-28170, a μ-Calpain inhibitor, was used to inhibit the activate of μ-Calpain. The cardiac function and cells apoptosis were detected. The activation of μ-Calpain, Bid and Apoptosis-inducing factor (AIF) were evaluated during the I/R protocol.

**Results** During the I/R protocol, the 76 kDa size of fragment, which was active fragment of μ-Calpain, significantly increased. In the same time, the expression of AIF in nuclear and Bid also increased. Administration of MDL-28170 decreases cells apoptosis from 36±3.9% to 25±7.1% p<0.05) and simultaneously improved the cardiac function. Administration of MDL-28170 also reduced the expression of Bid and attenuated mitochondrial-nuclear translocation of AIF.

**Conclusions** Our results suggested that μ-Calpain played a role of cells apoptosis in rats heart I/R injury. In this process, μ-Calpain regulate cardiomyocytes apoptosis via both caspase-dependent pathway (Bid) and non-caspase dependent pathway (AIF).

**GW23-e0667**

**THE INFLUENCE OF GENE MUTATION TO STATIN RESPONSIVENESS ON HIGH-RISK CV POPULATION IN CHINESE**

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**Objectives** To study the influence of gene mutation to statin responsiveness on high-risk cardiovascular disease (CVD) population in Chinese.

**Methods** This study collected 318 subjects of Chinese Han aged 20–70 years, who need statins treatment according to ‘Chinese guidelines on prevention and treatment of dyslipidemia in adults’ in 2007. Atorvastatin was taken 20 mg every night from first day of taken drugs to the end of 4 weeks. Statin responsiveness related to gene mutation was analysed.

**Results** (1) The relationship between genotypes of 144 SNP with LDL-C change% was analysed, 5 SNP were found to have significantly difference, which is rs2235013, rs2235033, rs1128503, rs1027603 of ABCB1 gene and rs717620 of ABCC2 gene. (2) The correlation between SNP and statin responsiveness were analysed in three genetic models, the results showed that the significant difference can be seen in the additive and dominant models of rs717620 and additive model of rs2235033 after adjusted for age, sex, BMI and baseline LDL-C levels. (3) Multivariable analysis on the correlation between rs1128503 and rs717620 with LDL-C change% indicated that striking differences were observed for LDL-C change% across two genotypes of two SNPs. Compared with the wild genotypes, carriers of mutant genotypes had 78% increased risk or 59% decreased risk. Statin response was compared under the joint effects of two SNPs under study involving the same pathway. Our results indicated that the joint effects of these two SNPs were significantly higher than that of respective one, LDL-C change% increased one times in group of rs1128503 wild +rs717620 mutant compared with group carried two wild genotypes.

**Conclusions** Genes encoding ABCB1 and ABCC2 may be logical candidates for statin response among Chinese with high CVD risk.
GW23-e0745 ALDOSTERONE IS A VASCULAR CALCIFICATION PROMOTING FACTOR

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Objectives Aim: To observe aortic and cardiac aldosterone expression and its receptor changes in rats with vascular calcification, and exogenous aldosterone effects on vascular calcification, so as to explore the significance of aldosterone in vascular calcification.

Methods Male SD rats were randomly divided into five groups. (1) Normal control group; (2) Aldosterone group: rats were received subcutaneously for 6 weeks (20 μg in 0.1 ml ethanol, 1/d); (3) Calcification group: rats were received intramuscular injection with vitamin D3 (300 000 IU/kg) and an intragastric dose of nicotine (25 mg/kg, in peanut oil) at 8:00 on the first day; nicotine was gavaged again at 18:00 on the same day. (4) Calcification+aldosterone group: Rats were treated as the calcification group, and also received aldosterone subcutaneously for 6 weeks (20 μg in 0.1 ml ethanol, 1/day). (5) Calcification+spironolactone group: Rats were treated as the calcification group, with the exception of oral gavage of spironolactone (40 mg/kg/d) for 6 weeks. The control group received normal saline injection, oral gavage of peanut oil, and ethanol treatment. At the end of the experiment, the extent of aortic calcification was confirmed by Von Kossa staining and measurement of calcium content. Alkaline phosphatase activity was also evaluated. Deposition of collagen in cardiovascular tissues was measured by masson staining. The content of aldosterone and urotensin II in plasma and aorta were determined by radioimmunoassay. The immunoactivity of mineralocorticoid receptor and urotensin II receptor were evaluated by immunohistochemistry. The content of C-reactive peptide, interleukin-6, tumour necrosis factor-α and monocyte chemoattractant protein-1 in the serum were determined by radioimmunoassay.

Results Von Kossa staining showed significant aortic calcium deposition in calcified rats. Aortic calcification was further aggravated when aldosterone was added. It was decreased in calcification+spironolactone group as compared with the calcification group, and the calcification+aldosterone group. In addition, aortic calcium content in aldosterone group increased, but not statistically significant (p>0.05), compared with the control group. In calcification group, the aortic calcium content increased by 63.45% (p<0.01), and 27.55% (p<0.05), respectively, compared with the controls and the aldosterone group. In calcification+aldosterone group, it was elevated by 121.72% (p<0.01), 73.02% (p<0.01), and 35.65% (p<0.01), respectively, compared with the controls, the aldosterone group, and the calcification group. However, in calcification+spironolactone group, it decreased by 41.31% (p<0.01), and 56.73% (p<0.01), than the calcification group and calcification+aldosterone group respectively. Alkaline phosphatase activity showed a similar trend. Vascular and myocardial collagen staining showed that the most obvious staining is seen in the calcification+aldosterone group. It was slightly reduced in the calcification+spironolactone group than the calcified rats. Immunohistochemical staining showed that mineralocorticoid receptor and urotensin II receptor the immunoactivity was higher, in the aldosterone group, the calcification group, and the calcification+aldosterone group, respectively, than the control group, with the most obvious staining in the calcification+aldosterone group. However, the immunoactivity in the calcification+spironolactone group was lower than the calcification group. Serum inflammatory factors, including C-reactive protein, interleukin-6, tumour necrosis factor-α and monocyte chemoattractant protein-1, increased significantly in the aldosterone group, calcified alone group, and calcification+aldosterone group, than the controls, especially in the calcification+aldosterone group. However, these inflammatory factors decreased in the calcification+spironolactone group, similar to the controls. In addition, aortic urotensin II contents increased in the aldosterone group, the calcification group, and the aldosterone+calcification group, especially in the aldosterone group and aldosterone+calcification group. The aortic aldosterone content in the calcified group was significantly higher than the controls.

Conclusions This study suggests that aldosterone is promoting factors contributing to vascular calcification, probably by stimulating inflammatory factors and urotensin II upregulation, in an autocrine/paracrine manner.

GW23-e0774 PROFIBROTIC INFLUENCE OF HIGH GLUCOSE ON HUMAN CARDIAC FIBROBLAST FUNCTIONS: EFFECTS OF 606A AND IMIDAPRILAT

Chi Jufang, Guo Hangyuan, Showang People’s Hospital

Objectives Recent studies have demonstrated an important role of chronic high glucose concentration for collagen deposition in fibroblasts. However, little is known about the action of angiotensin II type 1 receptor blocker and inflammatory cytokines on ACE inhibitor on matrix metalloproteinase (MMP) regulation and collagen synthesis in human cardiac fibroblasts. In this article, we determined the influence of chronic high glucose concentration on human cardiac fibroblasts functions and the effects of 606A and imidaprilat in these responses.

Methods Human cardiac fibroblasts were long-time exposure in normal or high glucose media in the absence or presence of 606A or imidaprilat. We have determined their MMP-2 activities by using in-gel zymography. In addition, the collagen IV synthesis was evaluated by the means of ELISA. Results show that chronic high glucose concentration inhibits the activity of MMP-2 and accelerates collagen IV synthesis. When Equimolar mannnitol was used as an osmotic control, the activity inhibition of MMP-2 were also observed, however, it is not as strong as that by using high glucose. Inhibition of MMP-2 activity and enhancement of collagen IV synthesis were reserved incompletely by 606A. But complete reservation of MMP-2 activity and collagen IV synthesis was observed by using imidaprilat in cultured media in the experiments.

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Conclusions Chronic high glucose inhibits the activity of MMP-2 and increases collagen IV synthesis by means of regulating MMP-2 mRNA expression in human cardiac fibroblasts through osmotic
and non-osmotic pathways. Inhibition of MMP-2 activity and enhancement of collagen IV synthesis were reserved incompletely by 606A. But complete reservation of MMP-2 activity and collagen IV synthesis was observed by using imidaprilat in cultured media in the experiments.

**THE ROLE OF EPLERENONE ON ACTIVITY OF MATRIX METALLOPROTEINASE-2 STIMULATED BY HIGH GLUCOSE AND INTERLEUKIN-1β IN HUMAN CARDIAC FIBROBLASTS**

Chi Jufang, Guo Hangyuan. Shaoxing People’s Hospital

**Objectives** Recent studies have demonstrated an important role of high glucose for collagen deposition in cardiac fibroblasts. However, little is known about the interaction of hyperglycaemia and inflammatory cytokines on matrix metalloproteinase (MMP) regulation in human cardiac fibroblasts. In this article, we determined the influence of high glucose and interleukin (IL)-1β on human cardiac fibroblasts functions and the effects of eplerenone in these responses.

**Methods** Human cardiac fibroblasts were cultured in normal or high glucose median the absence or presence of IL-1β and/oreplerenone. We have determined their MMP-2 activities by using in-gelzymography. In addition, the mRNA expression of MMP-2 and tissue inhibitor of metalloproteinase-2 (TIMP-2) were evaluated by the means of reverse transcription-PCR. Results show that high glucose stimulates the activity of MMP-2 and accelerates MMP-2 mRNA synthesis. When Equimolar mannitol was used as an osmotic control, the activity enhancement of MMP-2 were also observed, however, it is not as strong as that by using high glucose. We have also found that MMP-2 activity and mRNA expression were improved significantly (∼2×) by using the combination of high glucose and IL-1β as compared with using high glucose or IL-1β alone. Increase of MMP-2 activity and mRNA expression were blocked by eplerenone, that is, neither high glucose nor IL-1β has impacted TIMP-2 mRNA expression in the experiments.

**Results** show that high glucose stimulates the activity of MMP-2 and accelerates MMP-2 mRNA synthesis. When Equimolar mannitol was used as an osmotic control, the activity enhancement of MMP-2 were also observed, however, it is not as strong as that by using high glucose. We have also found that MMP-2 activity and mRNA expression were improved significantly (∼2×) by using the combination of high glucose and IL-1β as compared with using high glucose or IL-1β alone. Increase of MMP-2 activity and mRNA expression were blocked by eplerenone, that is, neither high glucose nor IL-1β has impacted TIMP-2 mRNA expression in the experiments.

**Conclusions** High glucose increases the activity of MMP-2 by means of regulating MMP-2 mRNA expression inhuman cardiac fibroblasts through osmotic and non-osmotic pathways. CombiningIL-1β with high glucose was found to increase significantly the MMP-2 activity and mRNA expression in human cardiac fibroblasts as compared with using IL-1β or high glucose in dividedly. However, such induced effects can be readily normalised by the use of Eplerenone.

**MIR-499 INDUCES CARDIAC DIFFERENTIATION OF RAT BONE MARROW-DERIVED MESENCHYMAL STEM CELLS**

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**Objectives** To test the hypothesis that over-expressing miR-499 in rat bone marrow-derived mesenchymal stem cells (BM-MSCs) induces them to differentiate into cardiomyocyte-like cells.

**Methods** The fourth passage of rat BM-MSCs were infected with lentiviral vectors bearing miR-499 or empty lentiviral vectors as control. The expression of cardiac-specific markers, NKx2.5, GATA4, MEF2C, and cTnI in these cells were examined by real time PCR or western blot analysis, respectively, 0, 1, 3, 5, 7 days.

**Results** The fourth passage of the cultured rat BM-MSCs express significant markers of MSCs. After transfection of microRNA 499 in MSCs, the expression level of microRNA 499 was markedly enhanced. The mRNA expression of GATA4, NKx2.5 and MEF2C gradually increased from day 3 to day 7. The cTnI expression was detected at the same time. These cannot be detected in MSCs infected with empty lentiviral vectors.

**Conclusions** Over-expression of miR-499 rat BM-MSCs can induce rat BM-MSCs toward cardiac differentiation.

**THE DETECTION OF VULNERABLE ATHEROSCLEROTIC PLAQUE RABBIT CAROTID MODELS BY OPTICAL COHERENCE TOMOGRAPHY**

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**Objectives** We sought to test the feasibility of imaging vulnerable atherosclerotic plaque in vivo using optical coherence tomography.
(OCT) to assess the value of vulnerable atherosclerotic plaque rabbit model established with a novel way.

**Methods** Thirty Rabbits were randomly divided into two groups: Group A (n=15): Balloon injury of carotid artery followed by high cholesterol diet (HCD) for 12 weeks. Group B (n=15): In this group, a thin filter paper slip statured with 10% ferric trichloride was lay between parafilter filter paper and common carotid artery infiltrated for 3–5 mins. We analysed OCT data including plaque incidence rate, plaque type and classification, lipid-rich plaque numbers between the two groups. Histopathology logical examination of plaque were also investigated to confirm our findings.

**Results** In each group, plaque were formation at the harvest time. In group A, lipid-rich plaque incidence rate was 76.9%, while group B was 46.2%. CD68 staining for large amount of macrophage verified that two groups had formed advanced atherosclerotic plaque. Furthermore, in group B 60% plaque had the feature of eccentricity which may get much more influence on the endothelial shear stress.

**Conclusions** OCT can accurately detect atherosclerotic lesions in vivo and could guide the design of invasive imaging approaches for detecting vulnerable atherosclerotic plaques. The study demonstrate that both groups can produce atherosclerotic plaque, while we get a better method for inducing the eccentricity atherosclerotic plaque on animal model.

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**THE ANTI-RESTENOSIS EFFECTS OF RAPAMYCIN AND PACLITAXEL ELUTING STENT IN SUSSCROTA DOMESTICA CORONARY ARTERY**

*Hong-liang Kong, Hong-liang Kong. The People’s Hospital of Liaoning Province*

**Objectives** To elucidate whether rapamycin and paclitaxel eluting stent (RPES) can prevent the development of restenosis after stent embedding coronary artery of susscrota domestica for 4 weeks. In addition, it was further elucidated whether RPES influences the proceeding of in-stent restenosis (ISR) by the expression of both early growth response factor-I (Egr-1) and nuclear factor κ B (NF-κB).

**Methods** According to the ratio of stent versus artery (diameter 1.1–1.21.0), 30 stents (diameter 2.0 mm and length 15 mm; each group: n=10), including bare metal stent (BMS), rapamycin eluting stent (RES, dosage 0.05 mg/every stent), rapamycin and paclitaxel eluting stent (dosage 0.05 mg/every stent, the ratio of rapamycin:paclitaxel=1.0:1.0) blended by reshaping polylactie glycolic acid (PLGA), were randomly implanted in the anterior descending coronary or circumflex branch coronary. After 4 weeks, coronary arteriography was finished and the specimens were drawn, the quantity of coronary artery (QCA) was estimated by measuring the average vascular diameter, vascular loss and radial restenosis. The most thickness, area of endarterium and area of vascular lumen embedded were measured by stent eosinophilic staining. Both Egr-1 and NF-KB were semi-quantitated by Rt-PCR or western blotting.

**Results**

1. Compared to BMS group, the average vascular diameter is significantly improved p<0.05, both vascular loss p<0.05 and radial restenosis p<0.05 are not found in both RES group and RPES group; there are not marked significance in average vascular diameter between RES group and RPES group (p>0.05).
2. There are a complete coverage of inner membrane on stent in three groups; both the most thickness p<0.05 and the area of endarterium p<0.05 are significantly improved and the area of vascular lumen p<0.05 are significantly decreased in both RES group and RPES group than those in BMS group p<0.05.
3. However, there is not statistical significance in the most thickness, area of endarterium and the area of vascular 1 umen between RES group and RPES group.
4. The expression of Egr-1 mRNA, not Egr-1 protein, is found in normal vascular section. Compared with normal vascular section, the expression of mRNA and protein of Egr-1 were significantly increased p<0.05 in BMS group; however, their expression were significantly decreased in RES group and RPES group than that in BMS group (all p<0.05).
5. There exist expression of NF-κB mRNA and its protein in normal vascular section. Compared to normal vascular section, the mRNA and the protein of NF-κB were significantly increased p<0.05 in three stent group (all p<0.05). However, their expressions are significantly decreased in RES group and RPES group than those in BMS group (all p<0.05).

**Conclusions** Blending rapamycin and paclitaxel eluting stent effectively prevents the restenosis, Egr-1 and NF-κB mediated the proceeding of in-stent restenosis.
Conclusions Gs-Rg1 may improve HF, which was mediated by proinflammatory factors, including a decrease in TNFα, NF-κB and an increase in both TNFR-2 and 1kB.

**GW23-e0182**

**GINSENOSIDE RE ENHANCES THE SURVIVAL OF H9C2 CARDIAC MUSCLE CELLS THROUGH REGULATION OF AUTOPHAGY**

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**Objectives** To examine the effect of ginsenoside Re (G-Re) on autophagy in H9c2 cardiomyocyte cells under starvation.

**Methods** H9c2 cells were cultured in glucose-free and serum-free medium for several hours as the glucose deprivation (GD) stimulation. To measure the amount of autophagosome formation, we determined the membrane-bound form of autophagy-related protein LC3B-2 by immunoblotting. To evaluate the situation of autophagy flux, we added 10 mmol/l bafilomycin A1 (BafA1) into the medium to block the fusion processes between autophagosomes and lysosomes. H9c2 cells under GD were treated with 100 μmol/l G-Re. LC3B-2 measurement and immunofluorescence were conducted to display the effect of G-Re on autophagy in these cells. Cell viability, ATP content, malondialdehyde level and superoxide dismutase activity in cultured medium were determined to appreciate the physiological relevance of autophagy changes due to G-Re treatment. We also assayed phosphorylated AMPKα and mTOR to explore the mechanisms underlying the effect of G-Re on autophagy in cells under GD.

**Results** In H9c2 cells under GD, LC3B-2 increased in a time-dependent manner in association with the decrease of cell viability and cellular ATP content. In H9c2 cell under GD and treated with 100 μmol/l G-Re, LC3B-2 expression decreased, accompanied by the rescue of cell death, the increase of cellular ATP content, and the relief of oxidative stress. The higher p-AMPKα in H9c2 cell under GD decreased when they were treated with 100 μmol/l G-Re, probably relating to the mechanisms underlying the inhibition of autophagosomal formation by G-Re.

**Conclusions** Starvation induced autophagy in H9c2 cells and led to cell injury. Treatment of 100 μmol/l G-Re inhibited autophagosomal formation in the cells, which may be beneficial to the cardiomyocytes under starvation.

**GW23-e0224**

**SERUM SOLUBLE CD137: RISK PREDICTION AFTER ACUTE CORONARY SYNDROMES**

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**Objectives** Increasing evidence shows that CD137 plays an important role in the pathogenesis of acute coronary syndromes (ACS). This study evaluate the clinical predictive value of increased serum soluble CD137 (sCD137) in patients with ACS and acute chest pain.

**Methods** The levels of Serum soluble CD137 were measured by ELISA in patients with ACS and acute chest pain. The platelet activation was assessed by flow cytometry.

**Results** The levels of sCD137 were elevated (above 35.0 ng/ml) in 75 patients with ACS and in 20 patients with acute chest pain (above35.0 ng/ml), respectively. The increased sCD137 level was significantly correlated with measured levels of troponin I (r=0.44, p<0.001) and the increased sCD137 levels (>35.0 ng/ml) were associated with higher risk for major adverse cardiovascular events (MACE, including AMI, sudden death and recurrent angina). Both elevated serum levels of sCD137 and cTnT showed a significantly increased risk of MACE in two groups during 30 days, 6 months and 9 months of follow-up. Importantly, there were 26 cTnT-negative subjects (<0.4 ng/ml) in ACS. However, in these patients, high sCD137 levels identified patients at risk for MACE not detected by cTnT-negative alone.

**Conclusions** In ACS patients, elevated sCD137 levels indicate an increased risk for cardiovascular events. Soluble CD137 might be a useful prognostic marker or indicator for adverse events in patients with ACS.

**GW23-e0235**

**EXERCISE TRAINING IMPROVES ISCHAEMIC TOLERANCE OF THE SENESCENT HEART BY AMPK-AUTOPHAGY CASCADE**

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**Objectives** Exercise promotes myocardial resistance to ischaemic injury. But the mechanisms underlying exercise induced anti-aged...
cardioprotection are incompletely understood. Here, we report that swimming training (ST) modulation of AMPK dependent autophagy prevents ischaemic injury in aged heart.

**Methods and Results**— young (4 months) and aged (22 months) mice maintained 10-week free-loading exercise training (swimming 1 h/day, 5 days/week).

**Results** Exercise significantly promoted basal autophagy in aged heart, which was accompanied by AMPK activation and mammalian target of rapamycin (mTOR) inhibition. As thus, exercise training improve the tolerance of aged hearts to ischaemia/reperfusion (I/R) injury as evidenced by reduced infarct size and cardiomyocytes damage, ameliorated the recovery of LV function after ischaemia as well as improved cardiomyocyte contractile function under hypoxic condition. Exercise training also restores the energy in response to I/R and cardiomyocyte mitochondrial membrane potential (MMP). Additionally, exercise induced cardioprotective effect and cardiac autophagy upregulation were impaired in AMPK KD mice. Furthermore, hypoxia stress–induced cardiomyocytes death in aged heart was promoted by autophagy depression.

**Conclusions** Excitation AMPK-autophagic flux by exercise training in senescence may be attributed to enhance intrinsic myocardial resistance to myocardial ischaemic injury in aged individuals.

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**GW23-e0159**  
**RETARDING EFFECT OF SIMVASTATIN ON ARTERY REMODELLING INDUCED BY HIGH-SALT AND HIGH-FAT DIET IN RATS**

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**Objectives** To investigate the effect of simvastatin intervention on the changes of blood pressure, serum lipid fluctuation and aortic configuration induced by high sodium plus high fat diets in rats.

**Methods** Sixty adult male SD rats were randomly divided into five groups (n=12): control group (N), high salt group (S), high fat group (F), high salt+high fat group (SF) and high salt plus high fat +simvastatin group (T). After fed for 16 weeks, the rats were subject to determine blood pressures and serum concentrations of TC, TG and sCD40L. The expression of CD40/CD40L in the root of aorta was determined by immunohistochemical method. The thickness of intima media in the ascending aorta as well as the ratio of lumen area/total vascular area were measured and calculated after HE staining. Results In S group, F group and SF group, systolic blood pressure was significantly higher than that in N group (p<0.01), systolic blood pressure in T group were slightly higher than that in N group with statistical significance and significantly slower than that in SF group. The concentration of triglycerides (TG) and total cholesterol (TC) in F group and SF group were significantly higher than those in N group and T group (p<0.01), and no significant difference between S group, N group and T group was observed. In S group, F group and SF group, the serum concentrations of sCD40L were higher than that in N group and T group (p<0.05), meanwhile that in SF group was also higher than that in S group and F group (p<0.05). However, no significant difference of sCD40L concentration between S group and F group as well as N group and T group was observed. The thickness of intima media in S group, F group, SF group was significantly thicker than that in N group (p<0.01), and no significantly different of intima media thickness between T group and N group was observed. The ratio of lumen area/total vascular area in S group, F group and SF group was smaller than that in N group (p<0.05), and no significant difference of ratio between T group and N group was found.

**Conclusions** Feeding high fat plus high salt leads to blood pressure elevation, induces atherosclerosis, increases serum concentrations of sCD40L and enhances the expression of CD40/CD40L in arterial tissues. The combination of stimulus has stronger effect than a single factor. Statins protect the arterial tissues against atherosclerosis by decreasing the level of serum sCD40L and inhibiting the expression of arterial tissues CD40/CD40L.

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**GW23-e1517**  
**HEMATOPORPHYRIN MONOMETHYL ETHER-MEDIATED PHOTODYNAMIC EFFECTS ON MACROPHAGES**

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**Objectives** Photodynamic therapy (PDT) has been shown to attenuate atherosclerotic plaque progression and decrease macrophage-infiltration. The effectiveness of PDT depends strongly on the type of photosensitizers. Hematoporphyrin monomethyl ether (HMME) is a promising second-generation porphyrin-related photosensitizer for PDT. This study is designed to investigate HMME mediated Photodynamic therapy on macrophage and define the cell-death pathway.
ABSTRACTS

ENHANCED HOMING OF MESENCHYMAL STEM CELLS TO THE ISCHAEMIC MYOCARDIUM BY ULTRASOUND-TARGETED MICROBUBBLE DESTRUCTION

doi:10.1136/heartjnl-2012-302920a.138

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Objectives
The transplantation of bone-marrow derived mesenchymal stem cells (MSCs) to ischaemic myocardium is considered to be a useful therapeutic approach to ischaemic heart disease, but the MSCs delivery efficacy still can’t meet the needs for therapy. Recently, ultrasound-targeted microbubble destruction (UTMD) has been utilised in the targeted delivery of stem cells. In this study, we tested the effects of myocardial micro-environment changes induced by ultrasound target microbubble destruction on promoting the MSCs homing to the ischaemic myocardium.

Methods
In order to optimise the ultrasonic parameters and to explore the biological effects of different intensities of ultrasound mediated microbubble destruction to the myocardium of canine, 9 mongrel dogs were randomly divided into three groups. Three groups were treated with frequency of 1 MHz ultrasonic irradiation, but the intensity of ultrasonic irradiation was different in each group. Group 1 was treated with intensity of 0.5 W/cm², group 2 was treated with intensity of 1.0 W/cm² and group 3 was treated with intensity of 1.5 W/cm². The myocardium was harvested from the margin of the infarcted area. Laser scanning confocal microscope (LSCM) was used to observe the distribution of the stem cells.

Results
Our data demonstrated that the intensity of laser-induced HMME fluorescence in macrophages steadily increased with the increasing incubation concentration of HMME. The survival rate of macrophages determined by MTT assay decreased with the increasing HMME concentration and irradiation time. HMME-based PDT induced macrophage apoptosis via caspase-9 and caspase-3 activation pathway detected by caspase fluorescent assay kits.

Conclusions
Our data demonstrated that HMME could accumulate in macrophages and HMME-mediated PDT induced macrophage apoptosis. These results imply that photodynamic therapy with HMME may therefore be a useful clinical treatment for unstable atherosclerotic plaques.

REGULATORY T CELLS PARTIALLY MEDIATE CARDIO-PROTECTION OF LATE ISCHAEMIC PRECONDITIONING IN RATS

doi:10.1136/heartjnl-2012-302920a.139

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Objectives
Myocardial ischaemia-reperfusion (IR) injury (IRI) is associated with activation of the innate immune system and the resultant inflammatory response. Myocardial ischaemic preconditioning (IPC) is the most powerful endogenous protective mechanism against myocardial IRI, probably via the role of anti-inflammation. Regulatory T cells (Tregs) play an important role in the negative modulation of immune responses. This study was designed to test whether and how much Tregs contribute to mediation of myocardial IPC against IRI.

Methods
IPC was induced by four episodes of 5 min ischaemia followed by 5 min reperfusion, and IR by 30 min ischaemia and then 48 h reperfusion in rats. (1) 96 rats were divided into two groups (n=48 per group): the control group, receiving sham operation and a sham IPC; and a myocardial IPC group, performing IPC. (2) Rats were divided into 4 groups (n=8 per group): Sham/Sham-IgG, underwent two sham operations at an interval of 48 h, and injected with placebo IgG at 24 h before the second sham operation; Sham/IR-IgG, underwent a sham operation and a run of 50 min IR (50 min myocardial ischaemia, then 48 h reperfusion) at an interval of 48 h, injected with placebo IgG at 24 h before 30 min ischaemia, and then kept reperfusion for 48 h; IPC/IR-IgG, underwent a run of IPC and a run of 30 min IR at an interval of 48 h, injected with placebo IgG at 24 h before 30 min ischaemia, and then kept reperfusion for 48 h; IPC/IR-NDS51, underwent a run of IPC and a run of 30 min IR at an interval of 48 h, injected with placebo IgG at 24 h before 30 min ischaemia, and then kept reperfusion for 48 h; IPC/IR-NDS51, underwent a run of IPC and a run of 30 min IR at an interval of
Results IPC caused a significant increase in the number of Tregs at day 1, 2, 3, and 5, and in the expression of FoxP3 at day 1, 2, and 3 in the heart after IPC. As compared to the placebo IgG-treated non-preconditioned rats (Sham/IR-IgG), the IPC-induced cardiac protection (IPC/IR-IgG) reduced the infiltration of neutrophils, macrophages, and CD4+ T cells respectively by 45%, 53% and 50%, infarct size by 45%, and to improve LVEF by 56%. As compared to the placebo IgG-treated preconditioned rats (IPC/IR-IgG), the NDS61-treated preconditioned rats (IPC/IR-NDS61) had more accumulation of inflammatory cells (Neutrophils: (2.62±0.61)×103/mm2 vs (1.77±0.41)×103/mm2, p<0.01; Macrophages: (1.51±0.56)×103/mm2 vs (0.96±0.41)×103/mm2, p<0.05; CD4+ T cells: (2.36±0.46)×103/mm2 vs (1.49±0.44)×103/mm2, p<0.05), larger infarct size (IS/AAR: 37.50%±4.75% vs 27.03%±3.27%, p<0.001) and poorer cardiac function.

Objectives Our data suggest that the IPC-afforded cardioprotection against IRI is associated with Tregs, and Tregs' negative modulation of inflammation response following myocardial IR is partially contributable to the late IPC and affords cardioprotection against myocardial IRI.

Conclusions Cardiomyocyte-specific knockout of calpain attenuates myocardial adverse remodelling and improves myocardial function after MI. These beneficial effects of calpain disruption may result from inhibition of cardiac apoptosis, inflammation and MMP-9 activity.

GW23-e1610 FOLIC ACID REDUCES ADHESION MOLECULES VCAM-1 EXPRESSION ON ENDOTHELIUM IN RATS WITH HYPERHOMOCYSTEINEMIA

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Objectives To investigate the effects of folic acid supplementation on the expression of adhesion molecules VCAM-1 in aortic endothelium of rats with hyperhomocysteinaemia (HHCY) induced by ingestion of excess methionine (MET).

Methods Thirty male SD rats (200±20 g) were divided into 3 groups (n=10 in each group): control group (Control), high MET group (MET) and MET plus folate group (MET + folate). The rats were fed respectively on normal diet, normal diet enriched by 17 g/kg MET and normal diet plus 17 g/kg MET and MET 0.06 g/kg folate for 45 d. The levels of total plasma homocysteine (HHCY) were detected and the expression of VCAM-1 protein and mRNA in aorta of rats was detected respectively by immunohistochemistry and RT–PCR.

Results The high-methionine diet resulted in a significant increase in the plasma HCY levels ((140.7±36.9) mmol/l vs (65.5±11) mmol/l). The serum HCY levels were significantly lower in rats fed on high—methionine plus folate—rich diet than those in rats fed on the high-methionine diet (50.6±21.8) mmol/l vs (140.7±36.9) mmol/l, p<0.05. The expression of adhesion molecules VCAM-1 at protein and mRNA levels was significantly reduced in aortic endothelium of rats fed on the high—methionine diet than that in control rats. The expression of VCAM-1 at protein and mRNA levels was significantly reduced in aortic endothelium of rats fed on high—methionine plus folate—rich diet compared with that in rats fed on high—methionine diet.

Conclusions A high methionine diet for 45 dissuffcient to induce HHCY. Folate supplementation to the rats fed on the high-methionine diet prevents the elevation of HCY levels in the blood and reduces the expression of adhesion molecules VCAM-1 in aorta of rats with HHCY.

GW23-e1604 HUMAN TISSUE KALLIKREIN 1 GENE OVEREXPRESSION IMPROVES VENTRICULAR REMODELLING WITH MYOCARDIAL INFARCTION IN RATS

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Objectives Tissue kallikrein 1 cleaves kininogen substrate to produce vasoactive kinin peptides that have been implicated in protecting against ischaemia/reperfusion-induced cardiomyocyte injury. The objective of this study was to explore the effect of recombinant
adenovirus-mediated human tissue kallikrein-1 (Ad-hTK1) on ventricular remodelling in rats after myocardial infarction (MI).

Methods Rats were subjected to ligation left anterior descending artery of coronary artery.1×10⁹ PFU Ad-hTK1 or control virus (Ad-EGFP) were injected at multiple sites into the infarcted myocardium 1 h after the operation. Four-weeks after the intervention, the protein expression of hTK1 was detected by Western-blotting analysis. A serial frozen sections, histological morphometric observation were carried out using fluorescence microscope and HE staining. Collagen were detected by Sirius red-statured picnic staining, and the number of myocardial microvessel was detected by CD34-FITC antibody immunocytochemistry assay.

Results The expression of green fluorescence and hTK1 protein were observed in MI-hTK1 rats. There were no differences in body weight among the groups at 4 weeks after MI. As compared with sham groups, MI resulted in increases in heart weight, LVW and LVWI, inflammation cells and collagen density, in decreases capillary density, at 4 weeks after MI. However, kallikrein gene delivery tended to reduce heart weight, LVW, LVWI, inflammation cells and collagen density at 4 weeks after MI. Capillary density in MI-hTK1 rats was also significantly increased than in the MI with control virus.

Conclusions This study indicates that recombinant adenovirus-mediated human tissue kallikrein-1 overexpression plays an important role in preventing the progression of MI by attenuating cardiac hypertrophy and fibrosis, improving neovascularisation.

MTORC1 AND MTORC2 PLAY DIFFERENT ROLES IN THE FUNCTIONAL SURVIVAL OF TRANSPLANTED ADIPOSE-DERIVED STROMAL CELLS IN HINDLIMB ISCHAEMIA MICE VIA REGULATING INFLAMMATION IN VIVO

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Objectives Poor cell survival severely limits the benefits from stem cell therapy for peripheral arterial disease (PAD). In this study, we investigated the role of mammalian target of rapamycin (mTOR) in survival and therapeutic function of engrafted murine adipose-derived stromal cells (mADSCs) in murine PAD model.

Methods mADSCs (1.0×10⁶) were isolated from dual-reporter firefly luciferase and green fluorescent protein positive (Fluc⁺/GFP⁺) transgenic mice, intramuscularly implanted into the hindlimb of C57BL/6 mice with femoral artery ligation, and followed by noninvasive bioluminescence imaging (BLI). Ex vivo Fluc assay and immunofluorescence analysis were employed to validate in vivo BLI. Protein expression and cell apoptosis were determined by Western blot/ELISA and TUNEL assay.

Results Even though grafted mADSCs yielded anti-apoptotic effect by modulating pro-/anti-inflammatory cytokines expression (IL-1β, TNF-α, IL-6, IL-10) in which mTOR signalling pathway participated, in vivo bioluminescence imaging longitudinally tracked a progressive death of mADSCs within post-transplant 4 weeks in the murine ischaemic hindlimb. Selectively inhibiting mTOR complex 1 (mTORC1) could attenuate pro-inflammatory IL-1β/ TNF-α production by rapamycin treatment together with mADSCs, which ultimately promoted mADSCs’ viability and anti-apoptotic efficacy in vivo. In contrast, dual mTORC1/mTORC2 blockade using PP242 aggravated IL-1β/TNF-α level and suppressed

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anti-inflammatory IL-10/IL-6 expression, which exerted deleterious effects on mADSCs’ survival and anti-apoptotic benefit.

Conclusions mTORC1 and mTORC2 may play different roles in regulating inflammation, which involves mADSCs’ functional survival in ischaemic hindlimb. These findings uncover that mTOR may evolve into a candidate within mechanism-driven approach to facilitate the availability of cell-based PAD therapy.

Objectives Activation of the reperfusion injury salvage kinase pathway (RISK), as phosphatidylinositol 3-kinase/Akt (PI3K/Akt), is a strategy aimed at decreasing cardiac damage in AMI. Erythropoietin (EPO) can activating the RISK pathway by EPO receptors in cardiomyocytes and have demonstrated EPO’s cardioprotective effects in myocardial reperfusion against ischaemia-reperfusion (I/R) injury through RISK pathway activation. As RISK has been reported to be impaired in diabetes. In this study we examined whether EPO-induced cardioprotection was maintained in rat models of type 2 diabetes.

Methods Diabetic cardiomyopathy rats was induced by intraperitoneal streptozotocin (STZ, 40 mg/kg) injection. One-week following STZ injection, and blood glucose levels >120 mg/dl were included in the study. High-fat diet rats (HFD) receiving high-saturated-fat diet STZ injection, and blood glucose levels >120 mg/dl were included in the study. High-fat diet rats (HFD) receiving high-saturated-fat diet STZ injection, and blood glucose levels >120 mg/dl were included in the study. High-fat diet rats (HFD) receiving high-saturated-fat diet STZ injection, and blood glucose levels >120 mg/dl were included in the study. High-fat diet rats (HFD) receiving high-saturated-fat diet STZ injection, and blood glucose levels >120 mg/dl were included in the study. High-fat diet rats (HFD) receiving high-saturated-fat diet STZ injection, and blood glucose levels >120 mg/dl were included in the study.

Results In hearts from healthy controls, EPO decreased infarct size (12.89±0.49 and 42.36±3.28% of left ventricle in EPO-treated and untreated diabetic groups: healthy controls (n=10), streptozotocin (STZ) +HFD-induced diabetes (n=12). All hearts underwent 25 min ischaemia and 30 min or 120 min reperfusion. They were assigned to receive either no intervention or a single dose of EPO at the onset of reperfusion.

Conclusions STZ+HFD-induced diabetes abolished EPO-induced cardiac protection against I/R injury through a disruption of upstream signalling of GSK-3b. Direct inhibition of GSK-3b may provide an important strategy to protect diabetic hearts against I/R injury.

Objectives To dynamically observe the mechanism of connective tissue growth factor and nerve remodelling in the atrial fibrillation rabbit models.

Methods (1) Ninety-six rabbits were randomly divided into two groups: control group (n=48) were not paced, AF group (n=48) underwent rapid atrial pacing, and each group were divided into 6 subgroups, 4 h group, 8 h group, 12 h group, 16 h group, 20 h group and 24 h group (n=8, respectively). The changes of AF inducibility, effective refractory period (ERP), dispersion of ERP, rate-adaptation of AERP and heart rate variability (HRV) were examined before pacing and after pacing.

(2) Left and right atrial diameter and left ventricular ejection fraction (EF) were examined by cardiac ultrasonography. Plasma concentration of CTGF was detected by ELISA. (3) The changes of CTGF and nerve growth factor (GAP-43, ChAT, TH) was detected by immunohistochemistry.

Results (1) After pacing 8 h, atrial fibrillation inducibility was significantly increased, duration of AF was significantly prolonged, AERP was significantly shortened, dispersion of AERP was significantly decreased and the rate-adaptation of AERP was significantly increased.

(2) The left and right atrial volume were enlarged with the pacing prolonging, but there was no significance (p>0.05). The EF at pacing 12 h was significantly decreased p<0.05).

(3) The plasma and tissue CTGF levels at pacing 16 h were significantly progressively increased p<0.05).

(4) HRV frequency domain, the LF and HF at pacing 8 h and 12 h were significantly increased p<0.05), the increasing of LF and HF reached a peak at 16 h and gradually decreased later. In AF group, the LF / HF was increased to the highest values (p>0.05) at 4 h, and then decreased to the lowest values (p>0.05).

(5) GAP-43, TH and ChAT positive nerve density in left and right atria were significantly increased at pacing 12 h p<0.05) and then gradually increased. However, the TH-positive nerve density in right atrium was higher than the left atrium, but the difference was not significant (p>0.05).

Conclusions (1) CTGF increased after rapid atrial pacing 16 h, which indicating myocardial fibrosis.

(2) Neural remodelling occurred after rapid atrial pacing 16 h, and vagal nerve tone was dominant.

(3) The changes of CTGF and HRV were consistent, which may be used to predict the myocardial fibrosis development of atrial fibrillation.
and functional changes and to further investigate the underlying mechanisms.

Methods Adult male rats were subjected to left anterior descending coronary artery occlusion and were randomised to receive one of the following treatments: saline (4 ml/kg/h i.v. injection beginning 10 min before the ischaemia and continuing for 2 h), insulin (60 U/i, i.v. injection following the same routine, and hypodermic injection of insulin (0.5 U/ml, 1 ml/kg/d) for 4 weeks after the ischaemia surgery), insulin plus a PI3K/Akt inhibitor wortmannin (15 mg/kg i.v. injection 15 min before each insulin administration), or insulin plus a p38 MAPK inhibitor SB239063 (0.5 mg/kg following the same routine).

Results At the end of 4 weeks after the ischaemia surgery, MI rats receiving long term insulin treatment showed smaller systolic left ventricle cavity (LVs) and thicker systolic interventricular septum (IVS), and increased cardiac ejection fraction (EF), left ventricular development pressure (LVDp) and the instantaneous first derivation of left ventricular pressure (∆LVP dP/dtmax) (all p<0.05 vs saline). Moreover, the insulin treatment significantly increased Akt but inhibited p38 MAPK phosphorylations, and increased the plasma brain natriuretic peptide (BNP) level though it did not change the BNP mRNA expression. These cardioprotective effects of insulin and its effect on BNP were not blocked by the PI3K/Akt inhibitor wortmannin, and could not be further strengthened by the p38 MAPK inhibitor SB239063 (all p<0.05).

Conclusions These data indicate that insulin improves post-ischaemic cardiac structural and functional changes via inhibiting p38 MAPK activation and thus increasing plasma BNP level.

GW23-e1279 EFFECT OF NEDD4L GENE FIVE COMMON POLYMORPHISMS ON HYPERTENSION-RELATED PHENOTYPES IN HAN CHINESE HYPERTENSION PATIENTS doi:10.1136/heartjnl-2012-302920a.148

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Objectives Hypertension is a complex disorder; part is due to genetic determinants. Mounting evidence has suggested that NEDD4L plays a pivotal role in maintaining Na+ balance, extracellular fluid volume and long term blood pressure control. We therefore regarded NEDD4L as a hypertension-susceptibility gene and genotyped its 5 common intronic polymorphisms to assess their association with hypertension-related phenotypes including Na+, K+ in serum, and plasma renin activity (PRA).

Methods A total of 1537 individuals were recruited and they were of Han Chinese descent including 669 patients with essential hypertension, 685 normal individuals and 210 patients with primary aldosteronism. The medical records were collected from Shanghai Ruijin Hospital containing the serum and urinary electrolytes and PRA and generally they were city-dwellers. DNA was extracted from whole blood and genotyping was carried out by allele discrimination method. Data were analysed using the Kruskal-Wallis Test, single-locus and haplotype analyses by SAS programme and SimHap software.

Results The serum sodium concentration between normal and hypertensive patients was statistically different (p=0.0001) and it was statistically different between control and patients with primary aldosteronism as well (p<0.0001). The five studied polymorphisms met Hardy-Weinberg equilibrium in the population (p>0.05). Single-locus analysis suggested that rs10503020 was associated with serum Na+ concentration and PRA (p=0.034 and 0.043, respectively) under additive model in essential hypertension patients. But in normal group, Na+ concentration was not related with the SNP rs10503020 under the add model. Patients with rs10503020 C allele had higher levels of PRA than those with TT genotypes (CC+CT: 3.87 vs TT: 2.96 ng/ml/h) and were more sensitive to postural change (p=0.147). Moreover, in hypertensive group, rs4149601 was associated with plasma aldosterone concentration in the additive model (p=0.032).

Conclusions Although both cases’ serum Na+ concentration was significantly different between control and case, only in hypertensive group was it associated with rs10503020. Our results demonstrated that rs10503020 of NEDD4L gene might influence sodium re-absorption in kidney and plasma renin activity to some extent in hypertensive people in Han Chinese.

GW23-e1155 RESEARCH CYP2C19*2 GENE POLYMORPHISM WITH ACUTE CORONARY SYNDROME doi:10.1136/heartjnl-2012-302920a.149

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Objectives Cytochrome P450 (cytochrome P450 or CYP450, hereinafter referred to as CYP) is a group of ferroheme enzymes. CYP2C19 enzyme is very important metabolic enzyme in this enzyme system. CYP2C19 gene has genetic polymorphism, which presents with different metabolism and has differences in individuals. A marked inter-individual difference has been reported in CYP2C19 activity. The research show normal homozygous genotypes CYP2C19*1/*1 represent for extensive metabolizer, mutation homozygous genotypes CYP2C19*2/*2 represent for poor metabolizer, heterozygote genotypes CYP2C19*1/*2 represent for intermediate metabolizer. At present, genotype distribution and allele frequency of CYP2C19 were explored in health the Han nationality and a part of minority population by literatures reported. But only a few literatures report that CYP2C19 gene polymorphism distribute in patients with acute coronary syndrome. The purpose of this research is to explore CYP2C19*2 gene polymorphism in patients with acute coronary syndrome, furthermore realise distribution of CYP2C19*2 genotype with acute coronary syndrome. And then we calculated and compared genotype and allele frequency in different gender. Clinicians can choose the right drug and rationally adjust the drug dose, by realising genotype with acute coronary syndrome and judging indirect metabolic patterns.

Methods The study includes 264 patients with acute coronary syndrome at the Cardiovascular Department, the Second Affiliated Hospital of Hebei medical university, including 185 males,79 females, aged 29-79 years. CYP2C19*1,*2 were analysed by PCR and molecular hybrid technology. Then we calculated genotype and allele frequency. Then, all patients were divided into two groups of gender (male group and female group), then we compared genotype and allele frequency: All data were analysed using SPSS 15.0 statistical software.

Results 1. CYP2C19 genotype and allele frequency. The analysis results: CYP2C19*1/*1 genotype: 129 patients (48.9%). CYP2C19*2/*2 genotype: 29 patients (11.0%). Alleles *1:364 (68.9%). Alleles *2:164 (31.1%). 2. CYP2C19 genotype and allele frequency distribution in different gender. Male 185 patients: CYP2C19*1/*1 genotype: 86 patients (46.5%), CYP2C19*1/*2 genotype: 79 patients (42.7%),
GW23-e1175

PROTECTIVE EFFECTS OF OPTIMAL PRESCRIPTION OF JIASHEN ON MYOCARDIAL INFARCTION IN RATS

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Objectives This study was designed to test the hypothesis that OPJSH modulates inflammatory processes to prevent cardiac functional deterioration and reduce myocardial infarct size (IS) after MI.

Methods Male Sprague-Dawley rats (9–10 weeks) were subjected to sham-MI or MI by ligating the left anterior descending coronary artery for 1 week. The rats were divided into five groups: sham, MI, OPJSH (3 g/kg/day), OPJSH (6 g/kg/day), and losartan (an AT1 antagonist, 10 mg/kg/day). The vehicle, OPJSH, or losartan was given by oral gavage once a day after MI. Both IS and cardiac function were determined using TTC staining and echocardiography at 1 week after MI, respectively. The levels of cytokine and chemokine were determined using ELISA at 1 week after MI.

Results OPJSH (3 or 6 g/kg/day) administered after MI reduced IS compared with MI group (39±3%, 53±13% vs 55±8%, p<0.05) with the greater effect at a dose of 6 g/kg/day. Administration of losartan also reduced IS compared with MI group (39±6% vs 55±8%, p<0.05). Compared with MI group, administration of OPJSH (3 or 6 g/kg/day) improved cardiac function as evidence by partially preventing the increases in LVEDD (9.2±2.8 vs 13.2±2.8 cm, p<0.05) and LVESD (4.1±0.9 vs 5.4±1.2 cm, p<0.05) and decreases in LVEF (75.4±4.9% vs 39.0±8.0%, p<0.05) and LVFS (16.3±0.13 or 0.65±0.13 cm, p<0.05) and LVESD (0.72±0.15 vs 0.55±0.15 cm, p<0.05). Postconditioning attenuated the IS and improved cardiac function that was associated with the normalisation of LVEDD (0.49±0.08 vs 0.87±0.15 cm, p<0.05) and LVFS (16.3±0.13 or 0.65±0.13 cm, p<0.05) and LVESD (0.72±0.15 vs 0.55±0.15 cm, p<0.05). Losartan treatment also inhibited the increases in myocardial levels of cytokine and chemokine compared with MI group (TNF-α: 4.71±1.14 or 3.97±0.72 vs 5.05±1.01 pg/mg protein, p<0.05; IL-1β: 10.18±1.56 or 7.47±2.50 vs 13.82±2.11 pg/mg protein, p<0.05; MCP-1: 8.78±1.12 or 7.52±0.63 vs 12.70±1.46 pg/mg protein, p<0.05).

Conclusions Our studies showed that consistent with losartan-induced cardioprotection, OPJSH administered after MI reduced myocardial IS and improved cardiac function that was associated with the decreases in myocardial levels of cytokine and chemokine. The data indicate that OPJSH exert its cardioprotection possibly via inhibiting inflammatory response. The results suggest that OPJSH may have a promising potential for the prevention and treatment of MI.

GW23-e1123

POSTCONDITIONING ATTENUATES THE MYOCARDIAL INJURY INDUCED BY ISCHAEMIA/REPERFUSION IN THE HYPERLIPIDEMIC RATS

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Objectives To investigate the effects of postconditioning (PostC) on the myocardial ischaemia/reperfusion injury in the hyperlipidemic rats.

Methods 60 Sprague-Dawley (SD) rats were randomly divided into Sham, I/R+normal diet, I/R+Vehicle+HC diet, I/R+PostC+HC diet groups. The levels of plasma lipid was examined by chromatography, and the area at risk (AAR) and infarct size were evaluated by TTC staining, the AAR was expressed as a percentage of the left ventricular area (AAR/LV). The plasma creatine kinase (CK) activity was also measured. Myocardial apoptosis examined by Caspase-3 activity assay; the mRNA and the protein expression of HIF-1α and iNOS were assessed by RT-PCR and Western blot.

Results The infarct size in Control group was greatly increased than that in Sham group both in normal diet and hyperlipidemia (53.38±1.4% vs 39.54±1.16%, p<0.01). Hyperlipidemia reinforced the increase of plasma creatine kinase (CK) activity by I/R. (0.56±0.06 vs 0.47±0.04, p<0.01), and further augmented myocardial apoptosis induced by I/R. The activity of Caspase-3 significantly increased in Control group compared to Sham group. However, hyperlipidemia further augmented the increase of Caspase-3 activity induced by I/R (4.63±0.42 vs 2.31±0.27, p<0.01). Postconditioning attenuated the myocardial infarct size in I/R rats by decreasing plasma CK activity (0.38±0.06 vs 0.43±0.05, p<0.05), and ameliorated Caspase-3 activity (1.72±0.16 vs 2.43±0.25, p<0.01). In normal diet rats, I/R extremely increased the HIF-1α protein level, while postconditioning further enhanced the increase of HIF-1α protein expression induced by I/R. But under the hyperlipidemic condition, HIF-1α protein level was much higher than that in normal diet groups. While postconditioning also markedly increased HIF-1α level. The mRNA level of HIF-1α were no significant changes in all groups. But the iNOS expression both in mRNA and in protein level were increased in hyperlipidemic rats.

Conclusions Postconditioning attenuates the myocardial injury induced by ischaemia/reperfusion in hyperlipidemic rats by increasing the expression of HIF-1α, which may be related to iNOS-cGMP signalling pathway.

GW23-e1124

STUDY OF ANGIOTENSINII-ROS-AUTOPHAGY PATHWAY IN VASCULAR ENDOTHELIAL CELLS

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Objectives As in recent years cell autophagy in depth research and found that the autophagic degradation of toxic substances, and...
damaged proteins and organelles by the lysosome system, and inadequate nutrition, lack of oxygen, recycling of degradation of these substances release of amino acids, nucleotides, fatty acids and other small molecules and energy in order to maintain the steady state of the cell. It is reasoned that the damage caused by Ang II VEC autophagy may be a potential mechanism to prevent the VEC injury, may become a new target for treatment of cardiovascular diseases and new strategies. Current research on the relationship between autophagy of Ang II and the VEC is still rare. In this study, we observed the influence of Ang II on the VEC autophagy, and to investigate the Ang II induced VEC possible mechanisms of autophagy.

**Methods** Intracellular ROS levels were detected by microplate reader after treatment with Ang II (10^{-7} mol/l) for 24 h in human vascular endothelial cells (EA.hy926). LC3-II protein level was detected by western blot assay after stimulation by different concentrations of AngII (10^{-8}, 10^{-7}, 10^{-6} mol/l) or by same concentration (10^{-7} mol/l) for different time (0 h, 6 h, 12 h, 24 h, 36 h) in EA cells. The mounts of autophagosomes were evaluated by fluorescence microscope after staining with acridine orange. Similarly, LC3-II protein levels and autophagosome formation were detected after treatment with AngII (10^{-7} mol/l). AngII combined 3-MA (2 mmol/l) or AngII combined NAC (50 μmol/l).

**Results** Treatment with AngII, intracellular ROS levels and LC3-II protein level was significantly increased (p<0.05) in EA cells, accomplish with the significant increment of the mounts of autophagosomes. AngII-induced autophagy (both LC3-II protein level and autophagosomes) was dramatically down-regulated by 3-MA or NAC in EA cells.

**Conclusions** AngII induces autophagy through promoting the generation of ROS in EA cells.

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**ABSTRACTS**

**GW23-e2581** INTERFERENCE WITH AKT SIGNALING IN DYSLIPIDEMIA DIMINISHES MYOCARDIAL INFARCTION AND PROMOTES SURVIVAL BY INHIBITING OXIDATIVE STRESS

doi:10.1136/heartjnl-2012-302920a.154


**Methods** To evaluate the diagnostic accuracy of 320-detector row CTA coronary angiography (CTCA) to detect CAD in patients with atrial fibrillation undergoing operations for rheumatic mitral valve disease.

**Results** Thirty-five patients were enrolled. All patients underwent both CTCA and conventional coronary angiography (CCA) before the operations. CT image quality (good, moderate, poor) and significant stenosis (≥50%) were evaluated by two cardiac surgeons, who blinded to the results of CCA. Pearson’s correlation analysis was performed to compare image quality with mean heart rate. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated by using conventional coronary angiography as the reference standard. Agreement in detection of CAD between 320-detector CTCA and CCA were evaluated with κ statistics, which was also used to assess intraobserver agreement.

**Conclusions** The mean heart rate was 94.7±21.4 beats/min. There was highly significant correlation between mean heart rate and image quality, especially for RCA (r=0.554, p=0.002) and LCX (r=0.559, p=0.016). On segment-based analysis, sensitivity, specificity, PPV and NPV were 87.5%, 99.4%, 82.4% and 99.6%, while the data were 87.5%, 97.6%, 82.4% and 98.4% on vessel-based analysis, 84.6%, 86.3%, 78.6% and 90.5% on patient-based analysis. The χ squared statistics were 0.843, 0.828 and 0.699, respectively. The agreement of intraobserver was 0.770.

**Conclusions** 320-row CTA allows accurate assessment of significant CAD. And it can be taken as a noninvasive coronary angiography to screen CAD in patients with atrial fibrillation, who scheduled for rheumatic mitral valve operations.

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**GW23-e2923** DIAGNOSTIC ACCURACY OF 320-DETECTOR CT CORONARY ANGIOGRAPHY IN PATIENTS WITH ATRIAL FIBRILLATION UNDERGOING OPERATIONS FOR RHEUMATIC MITRAL VALVE DISEASE

doi:10.1136/heartjnl-2012-302920a.153

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**Objectives** To evaluate the diagnostic accuracy of 320-detector row CT coronary angiography (CTCA) to detect CAD in patients with atrial fibrillation undergoing operations for rheumatic mitral valve disease.

**Methods** Thirty-five patients were enrolled. All patients underwent both CTCA and conventional coronary angiography (CCA) before the operations. CT image quality (good, moderate, poor) and significant stenosis (≥50%) were evaluated by two cardiac surgeons, who blinded to the results of CCA. Pearson’s correlation analysis was performed to compare image quality with mean heart rate. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated by using conventional coronary angiography as the reference standard. Agreement in detection of CAD between 320-detector CTCA and CCA were evaluated with κ statistics, which was also used to assess intraobserver agreement.

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on an Olympus BX51 microscope. Cardiac fibrosis was quantified by measuring the total stained area the total area of the heart using Image Pro.

Atherosclerotic Lesion Measurements

Atherosclerotic lesions were quantified by en face aortic coverage measured by computer-assisted planimetry. Aortae were cut open longitudinally, stained with Oil red O, and digitally scanned. Lesion area was assessed using Adobe Photoshop software.

En Face Immunostaining

VCAM-1 expression was assessed in endothelial cells, as demonstrated by CD31 staining, in the aortic arc and descending thoracic aorta by en face staining, followed by laser-scanning confocal microscopy (Leica TCS-SP) as previously described.

In situ TUNEL Staining

Hearts were embedded in OCT freezing medium and sectioned at 7 μm. Sections were then fixed in 4% PFA and analyzed for TUNEL staining using the In Situ Cell Death Detection Kit, TMR Red (Roche) according to the manufacturer’s protocol.

In situ detection of superoxide

Dihydroethidium (DHE, Invitrogen) staining for superoxide was carried out as previously described.

Results

Akt1 deletion under dyslipidemia alleviates cardiac dys-function?TKO EF7.67±6.60 vs DKO 21.94%±3.78% TKO F5 39.25%±3.23 vs DKO 16.22%±3.07, diminishes MI size(TKO 3.78%±0.86 vs DKO 22.02%±5.926), and, most importantly, prolongs lifespan DKO 44.23±7.43days/ TKO 51.43±6.29days. TKO mice exhibit reduced atherosclerosis. While dyslipidemia was equal, ROS generation and consequent oxidized lipid accumulation was dramatically reduced in TKO. Simultaneously, Akt1 deletion diminished CD36 expression, the main oxidized lipid receptor responsible for foam cell formation.

Conclusions

Interference with Akt activation improves survival during dyslipidemia by reducing oxidative stress and oxidized lipid responses thus providing a protective effect. Normalization or prevention of Akt overactivation during atherogenesis might be beneficial for the treatment of atherosclerosis and heart failure.

GW23-e2617

PROTECTIVE EFFECT OF LIGUSTRAZINE IN ATTENUATING MYOCARDIAL APOPTOSIS ON RATS WITH MYOCARDIAL ISCHAEMIA REPERFUSION AND ITS MECHANISM

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Objectives

To investigate the effect of ligustrazine (tetramethylpyrazine, TMP) in attenuating myocardial apoptosis on rats with myocardial ischaemia reperfusion (IR) injury and to explore its mechanism.

Methods

The animal model was built by ligation of the left anterior descending artery of rats (35 min of regional ischaemia followed by 120 min of reperfusion). Male Sprague-Dawley rats were randomly divided into sham, IR, TMP pretreated (TMP 10 mg/kg intravenous injection, 5 min before ligation), and TMP+L-NAME group (TMP 10 mg/kg intravenous injection, 5 min before ligation and L-NAME 30 mg/kg intravenous injection, 15 min before reperfusion). Caspase-3 activity and TUNEL staining were used to detect myocardial apoptosis. Nitric oxide production (NO) of myocardial tissue was examined using nitric oxide detection kit and expression of eNOS were observed by RT-PCR and western blot.

Results

There were some TUNEL-positive staining myocardial cells in experimental groups except the sham group. Compared with IR group, TMP reduced apoptosis index (15.0±2.9% vs 25.2±5.3% in the IR group, p<0.05) and caspase-3 activity (4.03±1.14 nmol/mlpro vs 9.54±2.69 nmol/mlpro in the IR group, p<0.05). TMP resulted in a marked increase in NO (0.40±0.04 μmol/g vs 0.30±0.03 μmol/g in IR group, p<0.05). The expression of eNOS mRNA and protein in the myocardium of rats in the TMP group increased significantly compared to that in the IR group. However, these effects could be significantly reversed by L-NAME which abolished the increase of NO production and eNOS mRNA and protein expression brought by TMP.

Conclusions

Ligustrazine offers antiapoptotic and cardioprotection effects against myocardial IR injury possibly through increasing the expression of eNOS and the level of NO.

GW23-e2618

THE EFFECTS OF ENDOTHELIAL PROGENITOR CELL TRANSPLANTATION AFTER MYOCARDIAL INFARCTION IN MICE

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Objectives

Endothelial progenitor cells (EPC) are thought to be engaged in neovascularisation after myocardial infarction (MI). In most cases, however, autologous EPC seem to be insufficient for recovery. EPC transplantation is a promising therapy for MI. The purpose of the present study was to explore the potential mechanism in EPC transplantation after MI.

Methods

Mononuclear cells were obtained from enhanced green fluorescent protein (EGFP) transgenic BALB/c mice. Cells were induced cultured, identified for EPC and transplanted into the border zone of infarct myocardium. Frozen sections of myocardium were inspected for EGFP positive cells 7 days after transplantation. Expressions of stromal cell-derived factor-1 α (SDF-1α) and vascular endothelial growth factor (VEGF) in the border zone were measured 3 days after surgery. Microvessel density and fibrosis in the border zone as well as cardiac function were assessed 4 weeks after surgery.

Results

EGFP positive cells formed circular structures 7 days after transplantation. Compared with vehicle, the expressions of SDF-1 α and VEGF in the border zone were enhanced 3 days after EPC transplantation p<0.05, p<0.01 respectively). Microvessel density was increased and fibrosis was decreased in the border zone 4 weeks after EPC transplantation p<0.05, p<0.01 respectively). Fractional shortening was higher with smaller left ventricular end-diastolic dimension and end-systolic dimension after EPC treatment compared to vehicle p<0.05.

Conclusions

EPC transplantation could improve cardiac function and ameliorate cardiac remodelling after MI in mice via participation in neovascularisation and paracrine effects of SDF-1 α and VEGF.

GW23-e2619

EFFECTS OF ERYTHROPOIETIN ON ENDOTHELIAL PROGENITOR CELL TRANSPLANTATION AFTER MYOCARDIAL INFARCTION IN MICE

doi:10.1136/heartjnl-2012-302920a.157

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Objectives

Previous studies suggested that transplantation of endothelial progenitor cells (EPC) could improve cardiac function after myocardial infarction (MI). However, survival of transplanted EPC seems unsatisfactory. The purpose of the present study was to
determine whether erythropoietin could ameliorate survival of transplanted EPC and further improve cardiac function after MI.

**Methods** We cultured and identified EPC which obtained from enhanced green fluorescent protein (EGFP) transgenic BALB/c mice. EPC with or without EPO were transplanted into peri-infarct myocardium after permanent ligation of the left anterior descending coronary artery. Transplanted EPC were detected 7 days after transplantation. Expressions of iNOS and eNOS in the border zone were measured 3 days after surgery. Apoptosis in the border zone and cardiac function was assessed 4 weeks after surgery.

**Results** EGFP positive cells were much more in the hearts treated with EPC and EPO than in those treated with only EPC 7 days after transplantation (p<0.01). The expression of iNOS in the border zone was decreased (p<0.01) while eNOS was further increased (p<0.05) in EPC and EPO treated hearts compared to only EPC treated ones. Apoptotic index was lower and left ventricular fractional shortening was higher after EPC and EPO treatment compared with only EPC treatment (p<0.05, both comparisons).

**Conclusions** Compared to only EPC treatment, EPO along with EPC transplantation could further improve cardiac function after MI at least partly by ameliorating survival of transplanted EPC, decreasing iNOS expression and increasing eNOS expression.

**GW23-e2623**

**EFFECTS OF HIGH-SALT DIET ON MYOCARDIAL REMODELLING AND THE INTERVENTION OF TELMISARTAN**

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**Objectives** To study the effects of high-salt diet on myocardial remodelling, and investigate the relevant mechanisms of telmisartan on the reverse of myocardial remodelling in Wistar rats.

**Methods** Twenty-four Wistar rats were fed by high-salt diet for 23 weeks which were divided into two groups: high-salt hypertensive group (HSH n=12) and high-salt normal blood pressure group (HSN n=12) according to the level of systolic blood pressure (SBP). The rats of telmisartan group (T n=12) were fed high-salt and telmisartan for 23 weeks too. Thirteen age-matched rats fed by normal-salt were used as controls (NS n=13). Myocardial morphology and structural changes were observed by HE staining and Masson staining. The content of superoxide dismutase (SOD) and malondialdehyde (MDA) in blood and left ventricle (LV) were measured by biochemistry and enzymology. Radioimmunoassay and enzyme linked immunoassorbent assay (ELISA) were employed to determine the content of tumour necrosis factor-α (TNF-α) and C-reactive protein (CRP). The protein levels of nuclear factor-κB p65 (NF-κB p65) were evaluated by western blot.

**Results** SBP in HSH was higher than other groups. In the high-salt groups, the ratio of left ventricular mass and body mass (LVMI), the myocardial cell diameter (CMD), the fibrosis area of myocardial interstitial (MIFI), the content of CRP, TNF-α (HSH (48.86±8.25), HSN (56.67±9.67) vs NS (40.59±4.37) ng/g, p<0.05), NF-κB p65 protein (HSH (87.77±10.3) ng/ml, HSN (75.18±16.67) vs NS (57.13±10.00), p<0.05) and SOD in the blood were significantly increased, while the level of SOD (HSH (83.48±5.78), HSN (54.59±6.65) vs NS (68.14±9.98) U/mgprot, p<0.05) in LV decreased. LVMI, CMD and MIFI were negatively correlated with the protein levels of NF-κB p65. Telmisartan partly reversed myocardial remodelling decreased the protein levels of NF-κB p65 and TNF-α, and increased the SOD activity in LV.

**Conclusions** The myocardial remodelling caused by high salt diet may be related to decreased SOD activity and inflammatory mechanism. Telmisartan prevents the salt-induced myocardial remodelling at least in part through inhibiting oxidative stress and inflammation.

**GW23-e2373**

**17β-ESTRODIAL INCREASES ABCA1 EXPRESSION AND CHOLESTEROL EFFLUX TO APOA I IN VIVO AND IN VITRO**

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**Objectives** Evidence from clinical trials and animal experiments has shown that oestrogen has anti-atherosclerotic effects that are independent of its cholesterol-lowering activity; these activities include reducing the proliferation of smooth muscle cells and leukocyte adhesion and increasing the synthesis of nitric oxide. However, whether oestrogen can regulate foam cell formation remains unknown. Here, we investigated the effects of 17β-oestradiol (E2) on cholesterol efflux in vivo and in vitro.

**Methods** ApoE-null mice (B6.129P2-ApoEtm1Unc) underwent an ovariectomy (OVX) or Sham operation at 5 weeks of age and then were treated with E2 or vehicle for the following 8 weeks. After above treatment, serum and aorta of mice were harvested and then lipid level, plaque size and composition were detected. RAW267.4 cells were pretreated with or without interferon-gamma (IFN-gamma) for 12 h then treated with E2 for additional 12 h, then ATP-binding cassette transporter A1 (ABCA1), ATP-binding cassette transporter G1 (ABCG1) and CD36 expression and cholesterol efflux rate to apoA I and HDL were detected.

**Results** Compared with the vehicle-treated mice, the serum total cholesterol level were decreased by 27.72% in the Sham group and 35.52% in the OVX+E2 group (p<0.01 for both), and the serum triglyceride level was decreased by 22.64% in the Sham group and 23.84% in the OVX+E2 group (p<0.05 and p<0.01, respectively). Compared with the OVX group, the size of the plaque area was significantly reduced by 22.08% in the Sham group and by 21.84% in the OVX+E2 group (p<0.01 for both). Oil Red O staining showed that the lipid deposits in the plaques decreased by 20.87% and 50.36%, respectively (p<0.01 for both). The immunohistochemical staining showed the percentage of ABCA1-positive areas in the plaque were 1.61 and 1.57 times higher (p<0.01 for both) in the Sham and OVX+E2 groups, respectively, than in the OVX group. According to above results, compared with the OVX group, the mRNA expression of ABCA1, the IFN-gamma inhibited ABCA1 expression of RAW 264.7 cells.

**Conclusion** Evidence from clinical trials and animal experiments has shown that oestrogen has anti-atherosclerotic effects that are independent of its cholesterol-lowering activity; these activities include reducing the proliferation of smooth muscle cells and leukocyte adhesion and increasing the synthesis of nitric oxide. However, whether oestrogen can regulate foam cell formation remains unknown. Here, we investigated the effects of 17β-oestradiol (E2) on cholesterol efflux in vivo and in vitro.
Objectives To detect the effect of Sini Decoction on the expression of Caveolin-1 and eNOS in EAhy926 cell injured by homocysteine.

Methods Model of EAhy926 cell injured by homocysteine was made, the protection on the EAhy926 cell of Sini Decoction with different dosages and different durations were observed. The effect of Sini Decoction on the expression of protein of Caveolin-1 and eNOS in EAhy926 cell were observed by Western-blot, and effection of Sini Decoction on the expression of mRNA of Caveolin-1 and eNOS in EAhy926 cell were observed by fluorescent quantitation PCR.

Results After model of EAhy926 cell injured by homocysteine was made, we found that cultured with 0.5, 1.0, 2.0, 4.0, 8.0 μmol/l homocysteine, cells grew less than cultured with normal culture medium, and with the increase of homocysteine concentration, the number of attached cell grew downwards obviously, as culturing with homocysteine 4.0 μmol/l for 24 h did lower damage to cells and could induce effective cell injuring, it was made to be the model of injury. To detect the effection of Sini Decoction on EAhy926 cell injured by homocysteine, well growing EAhy926 cells were cultured in culture plate. 24 h later, cells were cultured with DMEM medium containing 2% fetal calf serum for 8 h to make cells hungry, then cultured with medium containing Sini Decoction 0, 0.25, 0.5, 1.0 g/ml respectively for 30 min, then cultured with medium containing homocysteine 4.0 μmol/l for 24 h. It was found that, compared with control group, attached cells in Sini Decoction groups grew better, and attached cells in Sini Decoction 1.0 g/ml plus homocysteine 4.0 μmol/l group grew best. Detected by western-blot, it was found that, compared with control group, there was no obvious change of protein of Caveolin-1 and eNOS in Sini Decoction 0.25 g/ml group, and in homocysteine 4.0 μmol/l mediol group, expression of Caveolin-1 protein enhanced obviously, expression of eNOS protein weakened obviously, and in Sini Decoction groups, expression of Caveolin-1 protein weakened, and expression of eNOS protein enhanced, and in Sini Decoction 1.0 g/ml plus homocysteine 4.0 μmol/l group it was the most obvious p<0.05). Detected by fluorescent quantitation, it was found that, compared with control group, there was no obvious change of mRNA of Caveolin-1 and eNOS in Sini Decoction 0.25 g/ml group, but in homocysteine 4.0 μmol/l mediol group, expression of Caveolin-1 mRNA enhanced obviously, expression of Caveolin-1 mRNA weakened obviously, and in Sini Decoction groups, expression of Caveolin-1 mRNA weakened, and expression of eNOS mRNA enhanced, and in Sini Decoction 1.0 g/ml plus homocysteine 4.0 μmol/l group, it was the most obvious p<0.05).

Conclusions Homocysteine may injure EAhy926 cell by enhancing the expression of caveolin-1 then suppressing the expression of eNOS, while Sini Decoction may protect EAhy926 cell by suppressing the expression of caveolin-1 then enhancing the expression of eNOS.
**THE ROLE OF VASCULAR PEROXIDE 1 IN SPONTANEOUSLY HYPERTENSIVE RAT LEFT VENTRICULAR REMODELLING**

Objectives To test the role of vascular peroxide 1 (VPO1), a newly identified heme-containing peroxidase in left ventricular remodelling in spontaneously hypertensive rats.

Methods Twelve 24-week-old male spontaneously hypertensive rats (SHR) served as SHR group, and 12 age and sex matched Wistar Kyoto rats (WKY) were selected as control group. Systolic blood pressure was measured before experiment. After performing echocardiography analysis, hearts were isolated. Pathological changes of myocardial tissue were measured by HE staining, myocardial collagen was measured by Masson staining, and the expression of VPO1, MMP-2, MMP-9 and TIMP-2 was detected by immunohistochemistry and western blot. Rat heart-derived H9c2 cells were treated with angiotensin II until day 7. The cell surface area and the mRNA level of atrial natriuretic peptide, brain natriuretic peptide were measured. Expression of VPO1, MMP-2 and gelatinolytic activity of pro-MMP-2 and the concentration of HOCl was measured. The effect of VPO1 RNA interference on cardiomyocytes hypertrophy, HOCl generation, pro-MMP-2 activity and MMP-2 expression were observed. Furthermore, the direct effects of HOCl on pro-MMP-2 activity and MMP-2 expression were also examined.

Results Blood pressure in SHR was significantly higher compared with WKY, increased concentric left ventricular hypertrophy, myocardial cells hypertrophy while the expressions of VPO1, MMP-2, and TIMP-2 protein were significantly up-regulated were found in SHR. In cultured cells, treatment with angiotensin II significantly induced hypertrophy and increased the gelatinolytic activity of pro-MMP-2 and MMP-2 expression while unregulated VPO1 expression and HOCl production. Silencing VPO1 expression significantly suppressed angiotensin II-induced hypertrophy and increased MMP-2 activity concomitantly with decreased HOCl production. Moreover, treatment with HOCl also markedly increased the gelatinolytic activity of pro-MMP-2 and MMP-2 expression.

Conclusions VPO1 participating in the extracellular matrix remodelling by activate MMP-2 via HOCl formation, and therefore play an important role in development of left ventricular remodelling.

**INFLAMMATORY STRESS EXACERBATES CHOLESTEROL ACCUMULATION BY DISRUPTING SCAP IN HUMAN MESANGIAL CELLS**

Objectives We have demonstrated that inflammation play a significant role in glomerulosclerosis and its similarity to atherosclerosis is well described. The aim of this study was to investigate the dysregulation of SCAP pathway including cholesterol exogenous up-taking via LDL receptor, endogenous synthesis via HMG-CoA reductase in human kidney mesangial cell line (HMCs) cells induced by inflammatory cytokines.

Methods The normal HMCs and the HMCs were transfected with DNA plasmid or SCAP siRNA by electroporation to overexpress or knockdown SCAP. Intracellular lipid level of HMCs was assessed by Oil Red O staining and quantitative measurement intracellular cholesterol ester. Total cellular RNA was isolated from cells for detecting SCAP, LDLr, HMG-CoAR mRNA levels using real-time PCR; nSREBP-2 (N terminal of SREBP2), LDLr, HMG-CoAR protein expression were examined by western blotting.

Results IL-1β or SCAP overexpression increased intracellular lipid droplets accumulation and cholesterol ester level with a high concentration of LDL. SCAP gene silence decreased intracellular lipid droplets accumulation and cholesterol ester level under inflammatory stress. IL-1β or SCAP overexpression overrode SCAP, nSREBP-2, LDLr, HMG-CoAR suppression induced by a high concentration of LDL. SCAP gene silence decreased LDLr and HMG-CoAR mRNA expression and intracellular lipid level under inflammatory stress.

Conclusions IL-1β or SCAP overexpression disrupts cholesterol mediated LDLr and HMG-CoAR feedback regulation, thereby increasing nSREBP-2, LDLr and HMG-CoAR expression even in the presence of high concentration of LDL. SCAP gene silence decreases LDLr, HMG-CoAR mRNA expression and intracellular lipid droplets accumulation under inflammatory stress. These results suggest SCAP is a key node on lipid accumulation and foam cell formation; it would be a new therapy target under inflammatory stress of glomerular atherosclerosis.
Results Following 6 months of alcohol feeding, LVEF and FS were reduced $p<0.05$ for both), while IVEDD was augmented in the ACM group $p<0.05$, as compared with the control group. In addition, severe changes in cardiac structure were seen in the ACM group. The mRNA and protein expressions of ADAM-12 and syndecan-4 were up-regulated in the ACM group in comparison with the control group $p<0.05$ for all), while those of TIMP-3 were down-regulated. In both groups, the protein expression of ADAM-12 positively correlated with that of syndecan-4 and IVEDD $p<0.05$ for both), whereas it negatively correlated with LVEF $p<0.05$.

Conclusions Along with decreased expression of TIMP-3, ADAM-12 and syndecan-4 are over-expressed and are associated with ventricular remodelling in ACM. Therefore, the ADAM-12/syndecan-4 signalling pathway may represent a new therapeutic target in the prevention and treatment of ventricular remodelling in ACM.

GW23-e2082 VASCULAR PEROXIDE 1 IS INVOLVED IN VASCULAR REMODELLING IN SPONTANEOUSLY HYPERTENSIVE RATS VIA MATRIX METalloPROTEINASE-2 ACTIVATION
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Objectives Vascular peroxide 1 (VPO1) is a newly identified heme-containing peroxidase, which can utilise hydrogen peroxide (H₂O₂) generated from NAD (P) H oxidase to produce hypochlorous acid (HOCl) and catalyse peroxidative reactions. Considering the well-defined effects of matrix metalloproteinase (MMP) on the vascular remodelling during hypertension, and HOCl has a potential regulatory role in the activation of MMP via oxidative modifications, the aims of this study was to determine whether VPO1 is a regulator of MMP activity via HOCl formation and play an important role in vascular remodelling in spontaneously hypertensive rats (SHRs).

Methods Morphometry of structural changes in the aortic wall from SHRs and Wistar Kyoto rats were studied in haematoxylin/eosin, orcein and picrosirius red sections. The expressions of VPO1, MMP-2 and tissue inhibitor of MMP-2 TIMP-2 in the aortic tissue were measured with immunohistochemical staining, western blot or gelatine zymography. Cultured rat aortic smooth muscle cells (rVSMCs) were treated with angiotensin II, the expression of VPO1, MMP-2 and gelatinolytic activity of pro-MMP-2 were examined while the concentration of HOCl were measured. The effect of VPO1 RNA interference on HOCl generation, pro-MMP-2 activity and MMP-2 expression were observed. Moreover, the direct effects of HOCl on pro-MMP-2 activity and MMP-2 expression were also examined.

Results We found increased aortic collagen and elastin content in SHRs, which were associated with vascular hypertrophy. Increased vascular MMP-2 (but not TIMP-2) levels, and increased gelatinolytic activity, possibly as a result of increased VPO1 expression. In cultured rVSMCs, treatment with angiotensin II significantly increased the gelatinolytic activity of pro-MMP-2 and MMP-2 expression while unregulated VPO1 expression and generation of HOCl. Using VPO1 RNA interference rVSMCs, effects of angiotensin II on HOCl generation, pro-MMP-2 release and MMP-2 expression were significantly inhibited. Furthermore, treatment with HOCl also markedly increased the gelatinolytic activity of pro-MMP-2 and MMP-2 expression.

Conclusions These results indicate that VPO1 is involved in vascular remodelling in arterial hypertension by play a key role in the activation of MMP-2 via HOCl formation.

GW23-e2140 THE EFFECT OF SALT LOADING AND POTASSIUM SUPPLEMENT ON HYPERTENSION AND THE BALANCE OF TEFF AND TREG IN DAHL SALT SENSITIVE RATS
doi:10.1136/heartjnl-2012-302920a.166
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Objectives High dietary salt intake caused high blood pressure and renal injury. Potassium had an antihypertensive effect. In recent years, the infiltration or activation of immune cells has been implicated in the pathogenesis of salt-sensitive hypertension and target organ damage. This study investigated the effect of salt loading and potassium supplement on blood pressure and the balance of T eff and Treg in Dahl salt sensitive rats.

Methods Male Dahl salt sensitive rats and cosmic SS13BN rats were fed HS (3.0% NaCl) or normal salt (NS; 0.4% NaCl) diet or high-potassium plus high-salt (8% KCl+8% NaCl) diets for 8 weeks. Systolic blood pressure were measured by tail-cuff plethysmography. We investigated the infiltration of lymphocytes in kidney using immunohistochemical and immunoblotting. Real-time PCR was performed to identify IFN-mRNA, IL-4 mRNA and Foxp3 mRNA, Flow cytometric analysis were performed to analyse the percentage of Th1 (CD4+INF-+), Th2 (CD4+IL-4+) and Treg (CD4+CD25+Foxp3+) in spleen.

Results Compared with the SS13BN rats, the SS rats consuming a high-salt diet exhibited significant higher mean arterial pressure (MAP) (175.9±2.3 mm Hg vs 145.6±2.4 mm Hg), and lower MAP after high-potassium supplement (116.8±4.7 mm Hg vs 125.3±2.1 mm Hg) p<0.05). Immunohistochemical staining showed that in SS, the infiltration of lymphocytes in kidney was enhanced after high-salt diet, the changes were not remarkable in the high-salt/K, or SS13BN groups. The renal Foxp3 mRNA was down-regulated in the high salt group compared with normal salt group and up-regulated in the high-salt/K group compared with high salt group in SS rats. Salt loading enhanced the percentage of Tregs (13.8±0.5%) vs (6.5±0.4%) in SS rats, reduced the number of Tregs (5.3±0.8%) vs (6.5±0.3%). The high-salt/K group had opposite results.

Conclusions The balance of T cells participate the pathogenesis of salt-sensitive hypertension and kidney injury, potassium supplement could exert protection against hypertension and target organ damage.

GW23-e0584 COMPARISON OF HUMAN AMNIOTIC FLUID-DERIVED AND UMBILICAL CORD WHARTON’S JELLY-DERIVED MESCOHYMAL STROMAL CELLS: CHARACTERISATION AND MYOCARDIAL DIFFERENTIATION CAPACITY
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Objectives To compare the characterisation and myocardial differentiation capacity of amniotic fluid-derived mesenchymal stromal cells (AF MSCs) and umbilical cord Wharton’s Jelly-derived mesenchymal stromal cells (WJ MSCs).

Methods The human AF MSCs were cultured from amniotic fluid samples obtained by amniocentesis. The umbilical cord WJ MSCs were obtained from Wharton’s Jelly of umbilical cord which were obtained from the infants delivered full-term by normal labour. The morphology, growth curves, cells surface markers analysis by flow cytometry were compared between the two types of cells.
Myocardial genes (GATA-4, cTnT, α-actin, and Cx43) were detected by Real-time PCR and the corresponding protein expression were detected by western blot analysis after myocardial induced in AF MSCs and WJ MSCs.

**Results** Our findings revealed that AF MSCs and WJ MSCs shared similar morphological characteristics of fibroblastic shapes. The AF MSCs were easier obtained than the WJ MSCs and had a shorter time to reach adherence of 2.7±1.6 days to WJ MSCs of 6.5±1.8 days. The growth curves by MTT cytotoxic assay showed that the AF MSCs had a similar proliferative capacity at passage 5 and passage 10. However the WJ MSCs’ proliferative capacity were relatively decrease at 10 passage than 5 passage. Both AF stem cells and WJ stem cells had the characteristics of mesenchymal stromal cells respectively. The caspase-3 activity in I/R group was significantly increased more than those without AngII pretreatment. Dual blockade with valsartan and bosentan significantly lowered SBP (127±3 vs 105±3 mm Hg, p<0.001).

**Conclusions** The AF MSCs and WJ MSCs both have the potential clinical application for myogenesis in cardiac regenerative therapy.

**GW23-e0577** Lycopene Protects Cardiomyocytes Against Ischaemia/Reperfusion-Injury by Preventing Apoptosis

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**Objectives** Reactive oxygen species (ROS)-mediated calpain activation has shown to play an important role in cardiomyocyte apoptosis. Lycopene is a natural antioxidant carotenoid that has been shown to have protective properties on cardiovascular system. However, whether lycopene can protect cardiomyocytes from ischaemia/reperfusion (I/R) injury, and the mechanisms of lycopene’s effects are not clear.

**Aim** The purpose of this study was to investigate whether lycopene could efficiently protect against I/R-injury, and to elucidate the possible mechanism of its actions.

**Methods** Cultured cardiomyocytes from neonatal C57BL/6 mice were exposed to 4 h hypoxia followed by 8 h reoxygenation to simulate I/R-injury. Cardiomyocytes were divided into three groups: control, I/R, I/R+lycopene group (0.5 μM lycopene pretreated for 4 h before I/R). The apoptosis index of cardiomyocytes was counted by comparing TUNEL-positive counts with the total cell nuclei determined by Hoechst 33342 counterstaining. The intracellular ROS levels were quantified by detection of intracellular oxidant production based on the oxidation of 2',7'-dichlorofluorescin diacetate (DCFH-DA), and the activity of caspase-3 was also determined in these groups.

**Results** The apoptosis index was significantly increased in I/R group compare to control, and decreased in I/R+lycopene group (10.37±1.29%, 32.08±4.79% and 22.57±3.22%, respectively). The intracellular ROS level in I/R group was higher compared to control and lower in I/R+lycopene group (1.05±0.12, 2.40±0.27 and 1.88±0.18, respectively). The caspase-3 activity in I/R group was significantly increased compared to control and decreased in I/R+lycopene group (1.02±0.19, 2.27±0.64 and 1.42±0.19, respectively).

**Conclusions** These results demonstrated that lycopene protects against I/R-injury in vitro, which may be attributable to its roles in preventing ROS-mediated apoptosis.

**GW23-e0438** AngiotensinII Preconditioning Promotes Angiogenesis in Vitro Via ERKs Phosphorylation

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**Objectives** AngiotensinII (AngII) is involved in not only the formation of cardiac hypertrophy but also the development of cardiac remodelling both of which are associated with myocardial angiogenesis. This study was therefore performed to clarify the effects of AngII on the formation of vasculatures.

**Methods** Cardiac microvascular endothelial cells (CMVECs) were cultured for 18 h stimulated with or without the AngII preconditioning. Capillary-like tubes were analysed.

**Results** Incubation with AngII for 18 h significantly impaired the formation of capillary-like tubes compared to that without AngII. CMVECs with AngII pretreatment for 5 and 10 min formed more capillary-like tubes than those without AngII pretreatment, suggesting that preconditioning with AngII at a lower dose for a short period could prevent the further damage of CMVECs by a higher
concentration of AngII. Moreover, AngII (10−7 mM) stimulation for 5 and 10 min significantly increased the increase in extracellular signal-regulated protein kinases (ERKs) phosphorylation, and an ERKs inhibitor, pD98059, abrogated the increase in the formation of capillary-like tubes induced by the AngII-pretreatment.

Conclusions In conclusion, preconditioning with a lower concentration of AngII for a short period prevents the subsequent impairment of CMVECs by a higher dose of AngII, at least in part, through the increase in ERKs phosphorylation.

**GW23-e0072** STABLE MYOCARDIAL-SPECIFIC LENTI-S100A1 GENE THERAPY RESULTS IN HEART FAILURE AFTER MYOCARDIAL INFARCTION RESCUE

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Objectives The incidence of heart failure after myocardial infarction is ever-growing, and it is urgent to develop treatment improvements. An attractive approach is gene therapy; however, the clinical barrier has yet to be broken because of several issues, including the lack of an ideal vector supporting safe and long-term myocardial transgene expression.

Methods Here, we show that the use of a Lentiviral vector (Lenti-S100A1) containing a novel cardiac-selective enhancer/promoter element can direct stable cardiac expression of a therapeutic transgene, the calcium (Ca2+) -sensing S100A1, in a rat model of heart failure after myocardial infarction.

Results The heart failure–rescuing properties of myocardial S100A1 expression, the result of improved sarcoplasmic reticulum Ca2+ handling, included improved contractile function and left ventricular remodelling. Adding to the clinical relevance, long-term S100A1 therapy had unique and additive beneficial effects over β-adrenergic receptor blockade, a current pharmacological heart failure therapy

Conclusions These findings demonstrate that stable increased expression of S100A1 in the failing heart can be used for long-term reversal of LV dysfunction and remodelling. Thus, long-term, cardiac-targeted Lenti-S100A1 gene therapy may be of potential clinical utility in human heart failure.

**GW23-e0920** EFFECTS OF PHD2 ON PARACRINE EFFECT OF ADIPOSE DERIVED MESCENHYMAL STEM CELLS MEDITED CARDIOPROTECTION

doi:10.1136/heartjnl-2012-302920a.172

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Objectives To determine the roles of prolyl hydroxylase 2 (PHD2) RNA interference on the adipose-derived mesenchymal stem cells (ADSCs)-mediated paracrine effect against myocardial injury and to study its mechanism.

Methods ADSCs of passage 3 were transfected with lentiviral knockdown of PHD2. We established a superoxide damage model in vitro by treating neonatal rat ventricular myocytes (NRVMs) with hydrogen peroxide (H2O2, 100 mM) for 6 h. Conditioned medium (CM) of ADSCs was collected for pretreating NRVM. The cell apoptosis was detected by TUNEL staining and caspase-3 protein expression. Prosurvival cytokines VEGF, HGF and IGF-I secreted by ADSCs were determined by ELISA kit.

Results shPHD2-GFP-ADSC-CM significantly attenuated the apoptosis of NRVM, TUNEL positive rate decreased 30.3% and caspase-3 protein expression decreased 24.8%, comparing with GFP-ADSC-CM. Prosurvival cytokine IGF-1 in shPHD2-GFP-ADSC-CM significantly increased compared with GFP-ADSC-CM. The anti-apoptotic effect of shPHD2-GFP-ADSC-CM was largely blocked by neutralisation IGF-1.

Conclusions PHD2 inhibition of ADSCs enhances the paracrine-mediated myocardial protection, which may be associated with increased secretion of prosurvival cytokine IGF-1.

**GW23-e1041** CORRELATION OF RENAL RESISTIVE INDEX, TUMOUR NECROSIS α AND INTERLEUKIN 10 WITH HYPERTENSIVE RENAL DAMAGE

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Objectives To investigate the changes of renal resistive index (RRI) and the serum levels of necrosis α (TNF-α) and interleukin 10 (IL-10) in patients with hypertensive renal damage, whereby to explore the correlation of RRI, TNF-α and IL-10 with the hypertensive renal damage.

Methods Seventy three patients with primary hypertension were divided into two groups according to their urinary albumin excretion rate (UAER): normal buminuric hypertensive group (n=37), hypertensive renal damage group (n=36). RRI was measured using Doppler ultrasonography, serum TNF-α and IL-10 using radioimmuno assay. Thirty normotensive healthy persons were selected as normotensive control group.

Results RRI and TNF-α were significantly higher and IL-10 significantly lower in patients with essential hypertension than those in normotensive control group (p<0.5), and in patients with hypertension, those with renal damage had higher RRI and TNF-α and a lower IL-10 than those without (p<0.5), with a statistically significant difference among groups (p<0.5). RRI, TNF-α and IL-10 were found to have correlations with UAER (r=0.801, p<0.01; r=0.703, p<0.01; r=−0.613, p<0.01), but no correlation with the level of blood pressure, and RRI positively correlated with TNF-α (r=0.609, p<0.001), negatively with IL-10 (r=−0.533, p<0.01).

Conclusions RRI is remarkably increased in patients with hypertensive renal damage, whereby can be used as a parameter, together with UAER, in evaluating hypertensive renal damage. TNF-α is increased and IL-10 decreased significantly in patients with hypertensive renal damage, indicating that the imbalanced cytokine network may play a role in the pathological mechanisms of hypertensive renal damage.

**GW23-e1068** THE ROLE OF CAROTID INTIMA-MEDIA THICKNESS AND MICROALBUMINURIA ASSESSMENT IN CARDIOVASCULAR RISK EVALUATION IN PATIENTS WITH POLYVASCULAR ATHEROSCLEROSIS

doi:10.1136/heartjnl-2012-302920a.174

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Objectives To evaluate the relationship between CIMT, MA, atherosclerosis extent and CV event rates in patients with established atherosclerosis.
GW23-e1069

THE VARIATION OF THE CAROTID ARTERIOSCLEROTIC PLAQUE AND INTIMA-MEDIA THICKNESS BEFORE AND AFTER THERAPY PATIENTS OF THE CORONARY HEART DISEASE

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Objectives To investigate the variation of the carotid arteriosclerotic plaque and intima-media thickness before and after therapy in the patient of coronary heart disease. Evaluate the correlation between carotid intima-media thickness and coronary heart disease to provide prevention and treatment evidence for coronary heart disease.

Methods 240 coronary heart disease patients validated through angiographic examinations with the carotid arteriosclerotic plaque and abnormal intima-media thickness certified by Doppler ultrasound assessment were enrolled. Regular inspection of the carotid intima-media thickness by Doppler ultrasound after conventional coronary heart disease drug therapy, comparing the variation of the carotid arteriosclerotic plaque and intima-media thickness before and after therapy.

Results The difference of the carotid intima-media thickness, the number and the total area of the carotid arteriosclerotic plaque between before and after both at 6 months and 1 year of the treatment was highly significant (p<0.001). After conventional drug therapy, the amelioration of the carotid arteriosclerotic plaque and intima-media thickness was observed most notably after the mean 6 months treatment.

Conclusions The amelioration of the carotid arteriosclerotic plaque and intima-media thickness was observed most notably after conventional drug therapy, the coronary heart disease is in close relations with the carotid atherosclerosis and its treatment outcome.

GW23-e1608

EFFECTS OF FCγRIIIA ON AORTIC ARTERIOSCLEROTIC PLAQUE DESTABILISATION IN APOE−/− MICE

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Objectives Our previous studies suggest that Fc receptor III A of immunoglobulin G (FcγRIIIA, also named CD16) is closely correlated to coronary heart disease (CHD). However, the mechanism responsible for FcγRIIIA’s in contribution to CHD development remains largely unclear. Atherosclerosis, a chronic inflammatory

GW23-e1681

SONODYNAMIC EFFECT OF EMODIN ON MACROPHAGES

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Emodin has been used as an anti-inflammatory agent, and inflammation is a crucial feature of atherosclerosis. Here, we investigated the sonodynamic effect of emodin on macrophages, the pivotal inflammatory cells in atherosclerotic plaque.

Methods THP-1 derived macrophages were cultured with emodin for 2 h and then exposed to ultrasound for 15 m. Two-hours later, immunofluorescence staining was performed to determine the cytoskeletal protein polymerisation. Six-hours later, Hoechst-PI staining was applied to distinguish the normal, apoptotic and necrotic cells. At the same time, MTT assay was performed.

Results Two-hours after treatment for 15 m, control cells showed a regular cytoskeletal network, and nuclei showed uniform fluorescence. There were no obvious morphological changes of the cytoskeleton in cells treated with emodin alone. The fluorescence signal of cytoskeletal protein was slightly attenuated 2 h after ultrasound exposure in some cells. In the case of cells treated with emodin-SDT, α-actin, β-tubulin and vimentin filaments dispersed and the proteins aggregated. The cytoskeleton lost its original features. Six-hours after emodin-SDT, the viability of cells treated for 15 m decreased significantly. Cell viability decreased significantly to 54 ±5% in cells treated with emodin-SDT. Cell viability decreased 72 ±9% in cells treated with ultrasound alone. Cell viability decreased more significantly in cells treated with emodin-SDT for 15 m than ultrasound alone (p<0.01). Treatment with emodin alone did not affect cell viability compared to the control (p>0.05). At the same time, the cells showed typical apoptotic chromatin fragmentation. The controls and cells treated with emodin alone showed uniform blue fluorescence; apoptotic cells were seen as bright blue fluorescence spots, and necrotic nuclei were identified by the presence of staining with PI, which was evident as pink fluorescence. The percentages of apoptotic cells in the ultrasound group and the SDT group were higher than that of the control (26±6% vs 4±5%, p<0.01; 52±6% vs 4±5%, p<0.01, respectively). The percentage of apoptotic cells in the SDT group was higher than that in the ultrasound group (52±6% vs 26±6%, p<0.05). The percentages of necrotic cells in the ultrasound group and the SDT group were higher than that of the control (5±2% vs 2±1%, p<0.05; 17±5% vs 2±1%, p<0.01, respectively). The percentage of necrotic cells in the SDT group was higher than that in the ultrasound group (17±5% vs 5±2%, p<0.01). There was no discernible difference in the percentage of apoptotic and necrotic cells between the emodin treated group and the controls.

Conclusions Emodin induces the apoptosis and necrosis of macrophages under ultrasound exposure. The results imply emodin-SDT might be a potential treatment for atherosclerosis by reducing the infiltration of macrophages in atherosclerotic plaque.
state, is implicated in the pathogenesis of CHD. Thrombosis induced by atherosclerotic plaque destabilisation is the leading cause of the incidence of acute cardiovascular events. Herein, we investigated the possible role of FcγRIIA in the atherosclerotic plaque destabilisation using an aortic atherosclerosis mouse model of ApoE−/− mice in vivo.

**Methods** Twenty wt C57BL/6J mice were chosen as the control group, and 60 ApoE−/− mice were randomly divided into three groups. ApoE−/− group, ApoE−/−+ IVIG group, ApoE−/−+ Simvastatin (Sm) group, with 20 mice in each group. Mice in ApoE−/−+IVig group received an intraperitoneal injection of IVIG (1 mg/g) daily over a 5-day period prior to the exposure to high-fat diet. Mice in the ApoE−/−+Sm group received Sm (0.026 g/kg) per gavage for 10 weeks. Mice in C57 group and ApoE−/− group received PBS. Pathomorphological changes of aorta were observed by Masson staining evaluating plaques collagen content, immunohistochemical staining α-actin and CD68 evaluating contents of plaques vascular smooth muscle cells and macrophages, and oil red O staining evaluating plaques adipose tissue contents. FcγRIIA expression changes in mice with atherosclerotic plaque were determined by assaying the protein level of membrane CD16 on monocytes using immunofluorescent staining and FACS analysis. To verify the potential role of FcγRIIA in atherosclerotic plaque destabilisation and inflammatory response, matrix-metalloproteinase-9 (MMP-9) in aorta at protein level and mRNA expression and TNF-α, IL-1 and soluble E-selectin (sE-selectin) levels in sera were observed, respectively.

**Results** Aortic atherosclerotic plaque formation was induced in ApoE−/− mice after feeding on high-fat diet for 10 weeks which was confirmed by assessment of blood lipid levels and histological examination of aortic roots. The protein level of membrane CD16 on monocytes reflected by the percentage of CD16-positive cells in ApoE−/− mice was significantly increased compared to the control, and that in IVIG pretreatment mice was decreased compared to the ApoE−/− mice. Similarly, both the mRNA and protein levels of MMP-9 of aorta were increased in ApoE−/− mice. The role of FcγRIIA inhibition by IVIG in atherosclerotic plaque destabilisation in ApoE−/− mice was similar to that with Simvastatin treatment. Additionally, we observed increased serum levels of TNF-α, IL-1 and sE-selectin in ApoE−/− mice, compared to the C57 mice, and the effect of FcγRIIA inhibition by IVIG on inflammation was similar to the ApoE−/− mice treated with simvastatin.

**Conclusions** Collectively, our data demonstrate that FcγRIIA is involved in the atherosclerotic formation by stimulating expression of inflammatory cytokines and triggering the atherosclerotic plaque destabilisation.

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**GW23-e1588**

**FREE-BREATHEING 3D LATE GADOLINIUM ENHANCEMENT CARDIAC MR FOR THE EVALUATION OF LEFT VENTRICULAR INFARCTION IN A SWINE MYOCARDIAL INFARCTION MODEL**

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**Objectives** The purpose of this study was to evaluate a new free-breathing 3D phase sensitive inversion-recovery (PSIR) turbo FLASH pulse sequence for the detection of left ventricular myocardial scar in a swine myocardial infarction model.

**Methods** After inducing a myocardial infarction, eight mini Chinese swine’s were examined on a 1.5-T MR scanner for myocardial late enhancement after the administration of gadopentetate dimeglumine using a segmented 2D PSIR turbo FLASH sequence followed by a navigator-gated 3D PSIR turbo FLASH sequence. Image quality was scored by two independent readers using a 4-point Likert scale (0=poor, nondiagnostic; 1=moderate, diagnostics may be impaired by artefacts; 2=good, some artefacts but not interfering in diagnostics; 3=excellent, no artefacts). Scars were compared quantitatively in volume and graded qualitatively on the basis of size and location in these two sequences.

**Results** One pig died from anaesthetic accidents. The quality of the 3D PSIR images was acceptable in 6 pigs. Qualitative analysis of scar area (p=0.88), and scar location (p=0.81) were similar for both techniques. More hyperenhanced scar volumes (p=0.02) and small hyperenhanced scars (p=0.05), corresponding mostly to nonischaemic distribution patterns, were detected using 3D PSIR than 2D PSIR. Although 2D and 3D results were found to be highly correlated for scar volume, Bland-Altman analysis indicated a systematic smaller infarct volume on the 2D PSIR scans (R2=0.81).

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**GW23-e1620**

**THE EFFECTS OF PYRIDOXAMINE AND TELMISARTAN ON THE STRUCTURE AND FUNCTION OF KIDNEYS IN SPONTANEOUSLY HYPERTENSIVE RATS**

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**Objectives** Advanced glycation end-products and the receptors are involved in the pathophysiology of hypertension and promote the progression of the end-organ damage. The aim of this study was to investigate the effects of pyridoxamine and telmisartan on the structure and function of kidneys in spontaneously hypertensive rats.

**Methods** SHR (male, 20 weeks of age) were randomly divided into four groups (n=12): hypertension control group (given distilled water), telmisartan group given 6 mg/kg telmisartan), pyridoxamine group (given 200 mg/kg pyridoxamine) and TP group (given 6 mg/kg telmisartan and 200 mg/kg pyridoxamine), continued for 16 weeks. The normal control group included 13 WKY rats received gastric lavage with distilled water. SBP in rat tail artery was measured before and after the intervention. The levels of 24-h urinary albumin and the serum levels of AGEs were measured by nephelometry and ELISA after the intervention. Morphological changes in renal tissues were observed under light (H&E or Masson’s trichrome) and transmission electron microscopy. Expression of TGF-β in the renal cortex was investigated by Western Blotting.

**Results** The levels of 24-h urinary albumin, the serum levels of AGEs and the expression of TGF-β in the renal cortex was significantly increased in the HC group (p<0.01), and staining showed hardening of the glomeruli, and most of capillaries showed lumen occlusion and glomerular-capulse adhesion. The glomerular mesangial matrix was increased significantly in HC group. The levels of 24-h urinary albumin, the serum levels of AGEs and the expression of TGF-β in the renal cortex was significantly reduced in T, P and TP groups compared to that in the HC group (p<0.01), and those structural damages were also alleviated. The SBP in T and TP group were significantly lower than that of P group (p<0.01). The serum levels of AGEs in P and TP group were significantly lower than that of T group (p<0.05).

**Conclusions** Early renal damages were alleviated in intervention groups. Pyridoxamine and telmisartan can reduce the levels of urinary albumin in SHRs, and alleviate the structural damages. Those renoprotections of pyridoxamine may result from the reduction of AGEs.
Conclusions Free-breathing 3D FSIR turbo FLASH imaging is a promising technique for the assessment of left ventricular scar particularly for scar quantification and the detection of small non-ischemic scars in the myocardium. It can be an alternative method to detect of the infarcted myocardium in the clinic, particularly suitable for patients who cannot breath-hold.

GW23-e1206 PROTECTION OF QISHENG YIQI PILLS ON RATS WITH MYOCARDIAL INFARCTION OF.

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Yingzi Xu, Junping Zhang, Tianjin University of TCM, The First Affiliated Hospital of Tianjin University of TCM

Methods 50 male SD rats were randomly divided into normal group, model control group, experimental model group, isosorbide dinitrate (ISD) group, Qishen Yiqi (QSYQ) group, 10 rats in each group. Establishment of myocardial infarction models and the model of myocardial infarction with the deficiency of Qi and blood stasis, respectively, with isosorbide dinitrate and Shenqi Yiqi Drop Pill intervention. Cardiac ejection fraction, myocardial infarction and myocardial tissue GSK-3β, TRL4, NF-κB, β-catenin protein and gene expression were observed.

Results After NBT staining, myocardial tissue in the normal group were stained purple; there were large grey infarcted region in myocardial tissue of each model group. There were smaller gray infarction area than ISD group and QSYQ group. The ejection fraction (EF) in the model group, significantly lower than the normal group; Qishen Yiqi could improve cardiac function p<0.01. Immunohistochemical results shown, GSK-3β and of TRL4 protein expression in the normal group was low, the model group were higher than those in normal group (p<0.01); isosorbide dinitrate and Shenqi Yiqi Drop Pill could increase GSK-3β and TRL4 protein expression p<0.01. RT-PCR results show, β-catenin gene expression level was s the highest and NF-κB gene level was lowest in the normal group, β-catenin gene level was lower in the model group than that in normal group and NF-κB gene level was higher than that in normal group p<0.01; Qishen Yiqi Drop Pill could increase β-catenin gene expression and decrease NF-κB gene level (<0.01).

Conclusions The effect of Qishen Yiqi Drop Pill on myocardial protection may be relate to regulation of TRL4/NF-κB, GSK-3β/β-Catenin pathway.

GW23-e2123 QUANTITATIVE STUDY OF LUMBAR SPINE BONE MINERAL DENSITY AND CORONARY ARTERY CALCIFICATION IN ASYMPTOMATIC POSTMENOPAUSAL WOMEN.

Zhao Yuan, Xing Yan, Liu Wen-ya, Yang Wen, Wang Hai-tao, Liu Wen-ya. First Affiliated Hospital, Xinjiang Medical University

Methods 112 patients underwent quantitative CT (QCT) of lumbar vertebrae for bone mineral density (BMD) and multi-slice spiral CT (MSCT) of coronary artery for calcification score and total calcification score (TCS), filled out interview sheet for the details of general condition, lifestyle and other factors. All patients were divided into control osteopenia and osteoporosis groups based on the T score of the lumbar spine. The clinical data and BMD were compared among three groups by using an analysis of variance (ANOVA) for continuous variable. Analysis of osteoporosis and factors was done by using multiple regression.

Results age was significantly older in group of osteoporosis than other two groups p<0.05). Years of menopause were significantly different among the three groups of osteoporosis than other two groups, but there was no significant difference (p>0.05). Multiple regression analysis showed that the factors for TCS in patients included age smoking high density lipoprotein (HDL) and BMD, while age TC were risk factors, (HDL) and BMD were protect factors, There was negative correlation between the coronary artey calcification score and BMD.

Conclusions This study provides initial data suggesting that post-menopausal women who with osteopenia or osteoporosis may have a higher risk of developing coronary atherosclerosis, Osteoporosis was correlated with coronary atherosclerosis and BMD could be considered as an new index for assessment coronary atherosclerosis.

GW23-e2141 DIFFERENT EFFECTS OF ANGIOTENSIN II AND ANGIOTENSIN-(1–7) ON ENDOTHELIAL VCAM-1 EXPRESSION DURING ATHEROSCLEROSIS.

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Methods VCAM-1 RNA expression was analysed by real time RT-PCR. The endothelial surface expression of VCAM-1 was measured by flow cytometry. VCAM-1 promoter with NF-κ B binding sites were cloned into pGL3 vector. Luciferase assay was used to analyse VCAM-1 promoter activity in endothelial cells. NF-κ B translocation was observed by immunocytochemistry.

Results Treatment with Ang II resulted in an increase of VCAM-1 expression on endothelial cells, whereas Ang-(1–7) alone had no effects. However, preincubation with Ang-(1–7) inhibited Ang II induced VCAM-1 expression, which is demonstrated by flow cytometry and real time RT-PCR. In addition, Ang-(1–7) inhibited Ang II induced VCAM-1 promoter activity. Immunocytochemistry showed that Ang-(1–7) blocked Ang II induced translocation of NF-κ B from cytoplasm into nucleus, and the effects of Ang-(1–7) were abolished in the presence of MAS receptor antagonist A779.

Conclusions These results suggest that Ang-(1–7) inhibited VCAM-1 expression, at least in part, through negative modulation of Ang II induced NF-κ B pathway.

GW23-e2137 PROTECTION OF QISHENG YIQI PILLS ON RATS WITH MYOCARDIAL INFARCTION OF.

doi:10.1136/heartjnl-2012-302920a.182

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Objective To observe the protection and its mechanism of Ginger-yi dripping pills on myocardial infarction.

Methods 50 male SD rats were randomly divided into normal group, model control group, experimental model group, isosorbide dinitrate (ISD) group, Qishen Yiqi (QSYQ) group, 10 rats in each group. Establishment of myocardial infarction models and the model of myocardial infarction with the deficiency of Qi and blood stasis, respectively, with isosorbide dinitrate and Shenqi Yiqi Drop Pill intervention. Cardiac ejection fraction, myocardial infarction and myocardial tissue GSK-3β, TRL4, NF-κB, β-catenin protein and gene expression were observed.

Results After NBT staining, myocardial tissue in the normal group were stained purple; there were large grey infarcted region in myocardial tissue of each model group. There were smaller gray infarction area than ISD group and QSYQ group. The ejection fraction (EF) in the model group, significantly lower than the normal group; Qishen Yiqi could improve cardiac function p<0.01. Immunohistochemical results shown, GSK-3β and of TRL4 protein expression in the normal group was low, the model group were higher than those in normal group (p<0.01); isosorbide dinitrate and Shenqi Yiqi Drop Pill could increase GSK-3β and TRL4 protein expression p<0.01. RT-PCR results show, β-catenin gene expression level was s the highest and NF-κB gene level was lowest in the normal group, β-catenin gene level was lower in the model group than that in normal group and NF-κB gene level was higher than that in normal group p<0.01; Qishen Yiqi Drop Pill could increase β-catenin gene expression and decrease NF-κB gene level (<0.01).

Conclusions The effect of Qishen Yiqi Drop Pill on myocardial protection may be relate to regulation of TRL4/NF-κB, GSK-3β/β-Catenin pathway.

ABSTRACTS

Conclusions Free-breathing 3D FSIR turbo FLASH imaging is a promising technique for the assessment of left ventricular scar particularly for scar quantification and the detection of small non-ischemic scars in the myocardium. It can be an alternative method to detect of the infarcted myocardium in the clinic, particularly suitable for patients who cannot breath-hold.
CORRELATIONAL STUDY OF CD226 GENE SINGLE NUCLEOTIDE POLYMORPHISM AND DILATED CARDIOMYOPATHY IN THE CHINESE HAN POPULATION

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Objectives Background and objective: Dilated cardiomyopathy (DCM) is a group of heterogenic cardiomyopathy characterised by ventricular dilation and dysfunction. It is the third main culprit leading to heart failure and the most common cause of heart transplantation. Autoimmunity is one of the most important pathogenic mechanisms of DCM. Recent studies have reported two single nucleotide polymorphism (SNP) rs763361 and rs727088 within the last exon of CD226 gene were associated with multiple autoimmune diseases. However, it is still unknown whether these SNPs also affect patients’ susceptibility to DCM. In this study, we aim to investigate whether the SNPs rs763361 and rs727088 in CD226 gene are associated with DCM.

Methods Totally 308 DCM patients and 389 control subjects were recruited in this study. PCR-restriction fragment length polymorphism (PCR-RFLP) was used to genotype all the SNPs.

Results The frequency of T allele for SNP rs763361 was found to be significantly increased in the DCM group compared with the control group (44.8% vs 36.2%, OR=0.700, 95% CI 0.564 to 0.869, p=0.00076). Also, the frequency of TT genotype of SNP rs763361 in DCM patients compared with healthy controls were significantly different (14.9% vs 11.3%, p=0.00120). Meanwhile, the frequency of G allele of SNP rs727088 was found to be significantly higher in the DCM group than the control group (33.3% vs 23.7%, OR=0.621, 95% CI 0.491 to 0.786, p<0.00100). The distributions of GG genotype at SNP rs763361 in CD226 gene patients compared with healthy controls were significantly different (8.8% vs 3.5%, p=0.00011).

Conclusions Our results indicate that the association of the CD226 gene SNPs with human DCM, and the allele T at SNP rs763361 and allele G at SNP rs727088 in CD226 gene may increase the risk of DCM.

APPLICATION OF HIGH QUALITY NURSING SERVICE TO PCI PATIENTS IN CARDIOVASCULAR DIVISION

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Objectives The aim of this study was to evaluate the effect of high quality nursing service to PCI patients in Cardiovascular Division life satisfaction and the nursing job satisfaction.

Methods PCI patients in Cardiovascular Division were randomly divided into group A (n=100), group B (n=100) during August 2009–2011. There were no statistically significant differences in age, duration, diabetes, high blood pressure between two groups; The observation B group was given regular care, while the study A group was given high quality nursing service (preoperative: tell patients the duration of the operation in the multimedia way; give patients anxiety evaluation and comfort patients with psychological nursing measures; arrange the same type surgery patients to communicate, give routine preoperative preparation. Postoperative: give patients pain assessment, ease pain patients with the nursing steps; guide patients ways and frequency of limb exercise; measure postoperative blood pressure, skin temperature etc.) The two groups were compared in life satisfaction scale and patient satisfaction scale. Spss16.0 was applied to compare two sets of data, t test and a χ² test.

Results showed that there were statistically significant difference in three aspects score about enthusiasm for life degrees (A 1.24 ±0.22; B 2.23±0.15), self-confidence (A1.56±0.48; B 3.44±0.87) and mood (A 1.54±0.18; B 3.43±0.24), in life satisfaction scale between two groups p<0.05; there were statistically significant difference in three aspects score about Work attitude (A 98.6%; B 80.9%), life guidance (A 94.3%; B 78.2%), rehabilitation guidance (A 95%; B 79%) in patient satisfaction scale between two groups p<0.05.

Conclusions High quality nursing service improved the patient to his own life satisfaction, promoted the healing of the disease curative effect, improved the quality of nursing and reduced the risk of nursing at the same time, thus high quality nursing service might be given the extensive expansion in clinic nursing.
ABSTRACTS

GW23-e1130  NOD2 AGONIST PROMOTES THE PRODUCTION OF INFLAMMATORY CYTOKINES IN VSMC IN SYNERGY WITH TLR2 AND TLR4 AGONISTS
doi:10.1136/heartjnl-2012-302920a.186
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Objectives To investigate the expression of nucleotide-binding oligomerisation domain 2 (NOD2), an intracellular pathogen-pattern recognition receptor, in human vascular smooth muscle cells (VSMC), and the role of NOD2-mediated innate immune signalling pathway in the production of inflammatory cytokines in VSMC. We also explore the possible interaction of NOD2-mediated signalling pathway with those mediated by Toll like receptor 2 and 4 (TLR2 and TLR4) in the production of inflammatory cytokines in VSMC.

Methods Human coronary artery smooth muscle cells were stimulated with NOD2 agonist Muramyl dipeptide (MDP) alone or in combination with either TLR2 agonist Pam3CSK4 (Pam3) or TLR4 agonist lipopolysaccharides (LPS). The mRNA expression of NOD2 and fibroblast growth factor-2 (FGF-2) were measured by RT-PCR assay. The concentration of interleukin-8 (IL-8) and tumour necrosis factor-α (TNF-α) in the culture supernatants were determined by ELISA. VSMC proliferation ability was analysed by the MTT assay.

Results MDP can up-regulate the expression of NOD2 mRNA in VSMC in a time-dependent manner, up-regulate the expression of FGF-2 mRNA in VSMC, induce the production of IL-8 and TNF-α, and increase the proliferation ability of VSMC. Additionally, MDP can synergise with LPS and Pam3 to increase the proliferation ability of VSMC and induce the production of IL-8 and TNF-α.

Conclusions The activation of NOD2 mediated innate immune signalling pathway can increase the proliferation ability of VSMC and induce the production of inflammatory cytokines in VSMC. It is also shown a synergistic effect between TLR2 and TLR4 mediated signalling pathways in this process.

GW23-e1551  RELATIONSHIP BETWEEN NOVEL POLYMORPHISMS OF THE C5L2 GENE AND CORONARY ARTERY DISEASE
doi:10.1136/heartjnl-2012-302920a.187
Ying-ying Zhang, Xiang Xie, Yi-Tong Ma, Yi-Tong Ma. Department of Cardiology, First Affiliated Hospital of Xinjiang Medical University, Urumqi, 830054 RR., China

Objectives C5L2, a G protein-coupled 7-transmembrane domain complement, has been demonstrated to be a functional receptor of acyl-CoA synthetase-1 and triglyceride, total cholesterol, high-density lipoprotein, the difference remained significant in the Han group (p<0.001, OR=6.604, 95% CI 2.776 to 15.711) and in the Uygur group (p=0.047, OR=2.602, 95% CI 1.015 to 6.671). We also examined the role of C901A for CAD using two independent case-control studies: one was in the Han population (492 CAD patients and 577 control subjects) and the other was in the Uygur population (319 CAD patients and 554 control subjects).

GW23-e0207  THE RELATIONSHIP BETWEEN TLR2, HIF-1α, MMP-9 WITH THE OCCURRENCE AND MAINTENANCE OF ATRIAL FIBRILLATION
doi:10.1136/heartjnl-2012-302920a.188
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Objectives To discuss the relation between TLR2, HIF-1α, MMP-9 as immunological and inflammatory factor in the occurrence and maintenance of atrial fibrillation.
Results The level of IL-4 was measured by ELISA. The presence of NFATc1 in the atherosclerotic plaque was detected by PCR (RT-PCR) and OX40L and NFATc1 in lymphocytes was measured by Real Time PCR. The in vivo nuclear factor of activated T cells c1 (NFATc1) in ApoE mice during atherogenesis was significantly higher than that of the other three groups (p<0.05) and the level of persistent atrial fibrillation group was significantly higher than that of paroxysmal atrial fibrillation and control group (p<0.05), the level between paroxysmal atrial fibrillation and control group has no difference (p>0.05). The MMP-9 level of persistent atrial fibrillation group was significantly higher than that of the other three groups (p<0.05) and the level of persistent atrial fibrillation group was significantly higher than that of paroxysmal atrial fibrillation and control group (p<0.05), the level between paroxysmal atrial fibrillation and control group has no difference (p>0.05). The HIF-1α levels of paroxysmal atrial fibrillation and persistent atrial fibrillation group was significantly higher than that of the other two groups (p<0.05), the level between persistent atrial fibrillation group and persistent atrial fibrillation group has no difference (p>0.05), the level between paroxysmal atrial fibrillation and control group has no difference (p>0.05). Compared with left atrial diameter of the other three groups, that of the permanent atrial fibrillation group increased significantly. Compared with left atrial diameter of paroxysmal atrial fibrillation and control group that of the persistent atrial fibrillation group increased significantly. The left atrial diameter of paroxysmal atrial fibrillation higher than that of the control group (p<0.05). However, the LVEF decreased significantly in the atrial fibrillation groups (p<0.05). The LVEF between atrial fibrillation groups has no difference (p>0.05) between persistent and persistent atrial fibrillation group, there is a positive correlation between the LVEF and TLR2. The increase of TLR2, HIF-1α, MMP-9 level probably participates in occurrence of atrial fibrillation, thus it indicates that the inflammatory reaction may promote the occurrence and maintenance of atrial fibrillation.

Conclusion This study suggests that OX40-OX40L interaction regulates the expression of NFATc1, which may play a critical role in atherosclerotic plaque formation, which might also have implications with pathophysiology of atherosclerosis.

GW23-e0648 THE EFFECT OF MACROPHAGES ON THE BIOLOGICAL FUNCTIONS OF EPCS UNDER HIGH GLUCOSE CONDITIONS AND ITS POSSIBLE MECHANISM

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Objectives Diabetes mellitus can accelerate the atherosclerotic process, but its mechanism remains unclear.

Methods to explore the effect of macrophages on the biological functions of EPCS under high glucose condition and the role of toll-like receptor 4.

Methods and materials mouse peritoneal macrophages and mouse bone marrow-derived endothelial progenitor cells (EPCS) were cultured in media supplemented with high D-glucose (450 mg/dl D-glucose) and 350 mg/dl L-glucose. Macrophages and EPCS were co-cultured in a transwell co-culture system. 3H-TdR incorporation, transwell and nitrate recovery were used respectively to measure the abilities of EPCS to proliferate, migrate and secrete nitric oxide (NO). In vitro tube-formation analysis also was used to evaluate the antigenic ability of EPCS. TLR 4 of macrophages was knocked-down with TLR 4 siRNA, and EPCS functions were analysed as above.

Results In the co-culture system, the 3H-TdR incorporation in EPC group was significantly higher than that in MC/EPC group (26070±1969 cpm/well vs 12200±1420 cpm/well, p<0.01). The number of migratory EPC was 189.2±23.6 and 97.8±13.6 in EPC and MC/EPC group respectively, and there was significantly higher than those in MC/EPC group. The abilities of EPCS to proliferate, migrate, secrete NO, and form tube in vitro in MC/EPC group were improved after the knockdown of TLR 4 in macrophages.

Conclusions under high glucose conditions, macrophage could impair the biological functions of EPCS, and TLR 4 of macrophages may play a key role in this process, which may be an important mechanism that diabetes mellitus accelerate the atherosclerotic process.

GW23-e0744 A NOVEL VWF A3-GPI MODIFIED EPCS TO ENHANCE ITS ADHESION ABILITY TO DAMAGED VESSEL SEGMENT-COLLEGEN

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Objectives This study was designed to investigate the relationship between heme oxygenase (HO)/carbon monoxide (CO) system and nitric oxide synthase (NOS)/nitric monoxide (NO) system in diet-induced atherosclerosis.
Methods The rabbits serving as animal models were divided into six groups. The normal control group (n=8) were fed with normal sterile diet while the Cholesterol group (n=8) were fed with 1% cholesterol diet. The other four groups (L-arg group, L-NAME group, Hame group and ZnPP group; n=8) were fed with 1% cholesterol diet plus L-arginine (L-arg), NG-Nitro-L-arginine Methyl Ester (L-NAME), hame-L-lysinate and zinc protoporphyrin IX (ZnPPIX) respectively. The treatment lasted for 10 weeks.

Results Aortic plaques area in chol group was 40.2±8.9%. The decrease of aortic NO production and NOS expression was associated with increase of CO production (p<0.01) and HO-1 activity (p<0.01) in chol group when compared with controls. Aortic plaque areas reduced distinctly (26.6±9.2%) as well as the up-regulation of aortic CO production (p<0.01) and HO-1 activity (p<0.01) was significant when hame group was compared to chol group. On the other hand, in comparison with controls, NOS expression and NO production in hame group decreased significantly (p<0.01), but no apparent difference was drew between chol group and hame group. When Compared with chol group, aortic eNOS activity and NO production increased obviously and aortic plaques area (28.1±7.7%) was greatly reduced (p<0.01) in L-arg group. Reversely, HO-1 expression and CO production in L-arg group decreased distinctly when compared with those in control group, but the results in L-arg group were similar to those in chol group. The aortic c-myc and c-fos expressions in both hame group and L-arg group reduced significantly when compared with those in chol group, while they were similar to those in ZnPPIX group and L-NAME group.

Conclusions Our study demonstrates that HO/CO system can attenuate the development of atherosclerosis through its regulation and compensation to the NOS/NO systems in diet-induced atherosclerosis.

GW23-e0849 COMMON VARIATION IN WNK1 AND BLOOD PRESSURE RESPONSES TO DIETARY SODIUM OR POTASSIUM INTERVENTIONS: A FAMILY–BASED ASSOCIATION STUDY

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Objectives Blood pressure response to dietary sodium and potassium intake varies considerably among individuals, but the heterogeneity is far from being completely elucidated. WNK1 is a member of the WNK family of serine/threonine kinases with no lysine (K), and these kinases have been implicated as important modulators of sodium and potassium homeostasis in the kidney. Aims of the study were to investigate whether WNK1 gene polymorphisms are associated with blood pressure variations to dietary salt or potassium intervention.

Methods Based on subjects in population cohort, a 3-day base survey was carried out in 539 normotensive adults in 2004, they were recruited for determination of BP response to sodium or potassium using 7 day low salt - 7 day high salt - 7 day high salt plus potassium supplement diet intervention. Genomic DNA was extracted from whole blood using ReadyAmpTM DNA Purification Kit; the genotyping experiments of 5 SNPs of WNK1 were done using ligase detection reactions (LDR), namely rs830054, rs12828016, rs956868, rs2301880, rs765250; Family Based Association Test (FBAT) programme 2.0.2 were used to test the association of single marker or haplotypes and BP responses to dietary sodium or potassium interventions.

Results Statistically significant associations were observed between the genotypes of rs2301880 and SBP; DBP or MAP responses to dietary high sodium interventions; rs12828016and rs830054 were associated with DBP responses to dietary low or high sodium interventions, but not SBP; no association between rs765250 or rs956868 and BP responses to dietary sodium or potassium interventions; BP responses to dietary potassium intervention was not associated with any genotypes.

Conclusions WNK1 gene polymorphisms were associated with blood pressure response to sodium intervention, suggesting that WNK1 gene may be involved in the formation of salt sensitivity, and maybe a new molecular genetic markers of salt sensitivity.

GW23-e0800 CALPAIN ACTIVATION CONTRIBUTES TO ISCHAEMIA/REPERFUSION-INDUCED MYOCARDIAL APOPTOSIS

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Objectives Calpains belong to a family of calcium-dependent intracellular cysteine proteases. Previous studies demonstrated that
calpain activation contributes substantially to ischaemia/reperfusion (I/R) injury. However, it remains unclear whether administration of calpain inhibitor ameliorates I/R-caused heart injury in vivo.

**AIM** The objective of this study was to investigate the role of calpain inhibitor PD150606 (PD) in I/R-induced cardiomyocyte apoptosis.

**Methods** Male C57BL/6 mice, 2–4 months of age, were randomly divided into sham, I/R, and PD+I/R group (1 mg/kg by IV injection 30 min before ischaemia). Mice were subjected to ischaemia by ligation of the left anterior descending coronary artery for 45 min, then reperfusion for 3 h. The risk and necrotic areas were assessed by Evans blue dye and triphenyltertrazolium chloride (TTC) staining, respectively. Myocardial apoptosis was assessed by using TUNEL staining. ELISAs for cytochrome c level, and fluorescence assays for the activity of calpain and caspase-3 activities.

**Results** Compared to I/R group, the ratio of infarct to risk size was significantly decreased in PD+I/R group (32.26±1.91% vs 29.55±1.64%). Compared to control, myocardial caspase-3 activity was significantly increased in I/R group, however, it was significantly decreased in PD+I/R group (2.47±0.57, 5.13±0.50 and 3.40±0.39 AMC cleaved pmol/mg protein, respectively). Calpain activity (1.15±0.16, 2.07±0.15 and 1.55±0.10 arbitrary units/mg protein, respectively), cytochrome c concentration (5.66±0.54, 8.38±0.64 and 7.57±0.56 ng/mg protein, respectively), and TUNEL-positive nuclei (0.56±0.05%, 1.10±0.05% and 0.79±0.05%, respectively) were significantly increased in I/R mouse compared with control, but were decreased by PD treatment.

**Conclusions** Calpain inhibitor PD treatment is an effective strategy to prevent I/R induced myocardial apoptosis in vivo.
Methods
In comparison with the control, TA group had significantly lower levels of hsCRP on day 3 ((18.36±6.27) mg/l vs (12.37±5.23) mg/l, p<0.05) and day 7 ((10.94±5.81) mg/l vs (6.39±3.76) mg/l, p<0.05), and had obviously lower peak levels of cTNT on day 1 ((9.42±2.71) ng/ml vs (6.37±2.33) ng/ml, p<0.05). There are no statistical differences in the left ventricular end-systolic volume (LVEDV) and end-diastolic volume (LVEVS) between TA group and the control at a 1-year follow-up, but TA group had significantly higher left ventricular ejection fraction (LVEF) ((52.36±3.48) % vs (44.21±3.34) %, p<0.05) than the control. There were no differences in the incidences of MACE during hospitalisation, at 30-day and 1-year follow-ups.

Conclusions
The administration of thrombus aspiration during primary PCI in patients with STEMI may reduce hsCRP level, alleviating the injury of myocardium, followed by an improvement of LVFS at a 1-year follow-up.

GW23-e2592
THE STUDY OF APOPTOSIS MECHANISM IN THE PROCESS OF RECOMBINANT INTERLEUKIN-12 TREAT THE MICE WITH VIRAL MYOCARDITIS

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Objectives
Through studying the NK cell activity, the pathological changes of myocardial cells and the changes of apoptosis in the process of recombinant interleukin-12 treat the mice with viral myocarditis, to explore the therapeutic effect and mechanism of apoptosis in the process of recombinant interleukin-12 treat the viral diseases, to further reveal the treatment effect and therapeutic mechanism of recombinant interleukin-12 to viral diseases, and to make a theoretical foundation for the clinical use of recombinant interleukin-12.

Methods
A total of 90 BALB/C inbreeding male mice weight 14–18 g were randomly divided into six groups, each group has 15 mice. They are blank control group, the virus control group, drug control group, rmlL-12 small dose treatment group, medium dose treatment group, high dose treatment group. Each mouse was injected Coxsackie B3 0.2 ml/d for three consecutive days by intraperitoneal injection, in addition to except the mouse in blank group. After inoculating 4 h, in the blank control group and the virus control group, each mouse was inoculated 0.9% saline 0.1 ml/d by intraperitoneal injection, in the drug control group, each mouse was inoculated interferon-of γ 400 IU/d, rmlL-12 small-dose, medium-dose and high-dose treatment group, the mouse in each group were injected recombinant interleukin-12 respectively 1 ng/d, 10 ng/d, 100 ng/d for five consecutive days. The time of injecting virus is the zeroth day. At the fifth day, we take 10 mice from each group, than killed them by cervical dislocation. We removed the spleens for testing the NK cell activity, under sterile conditions. We removed the hearts, than make heart specimens. We soaked the heart in 10% formalin solution and marked them for the test of heart pathology and apoptosis. NK cell activity was measured by MTT assay. Apoptosis was detected by TUNEL and pathological scores. Cardiac muscle pathology was detected by HE staining. The statistical data was expressed as mean±SD (x̄±S). The data were analysed by SPSS17.0 statistical software analysis system. Groups were analysed using analysis of variance. p<0.05 was considered as statistically significant.

Results
In addition to the blank control group, each group can be detected the apoptosis of myocardial cells. The pathological scores of apoptotic cells are that, high dose treatment group is 29.18%, medium dose treatment group is 20.97%, small dose treatment group is 12.03%, drug control group is 10.51%, virus control group is 15.63%. The largest number of apoptotic cells is the high dose treatment group, followed by the middle dose treatment group, and the low dose treatment group and the virus control group is less than the above two groups. The NK cell activity in each group is that, blank control group is 29.58±4.56%, virus control group is 46.99±6.31%, drug control group is 34.54±3.98%, small dose treatment group is 42.14±4.02%, medium dose treatment group is 54.55±7.17%, high dose treatment group 57.06±4.55%. There are statistically significant differences in different groups about NK cell activity, F=34.98, p<0.01. There are significant differences in medium-dose group, virus control group and the drug control group p<0.05). There are not significant differences between drug control group and small dose treatment group. Myocardial pathological changes (the degeneration and necrosis of myocardial cell) are lighter in medium-dose treatment group than the other treatment groups. And, the virus control group and the high dose treatment group are most severe than other groups. The blank control group has not the degeneration and necrosis. The structural changes and proliferation in the media of aorta and the changes of media thickness of MT and Lumen diameter (LD), ratio of media to lumen (MT/LD), the collagen volume fraction and FCNA positive expressive percentage of arteri- ies in high-salt group were increased (p<0.05), the activities of Na⁺⁻K⁺-ATPase and Ca²⁺-ATPase in MH group were decreased (p<0.05). The mRNA expression of Na⁺⁻K⁺-ATPase α₁ subunit in...
MH and MN groups was decreased (P<0.05), and PMCA1 expression raised in MH group. Correlation analysis showed that two ATPase activities and vascular remodelling indicators have a negative correlation (p<0.005). Compared with high-salt group, blood pressure, media thickness, ratio of media to lumen, the collagen volume and PCNA positive expressive percentage were lower in telmisartan group (p<0.05).

Conclusions High-salt diet could lead to arterial remodelling directly or indirectly (elevated blood pressure). The decreased ion pump activity and abnormal gene expression may be one of the mechanisms of high-salt induced arterial remodelling. Telmisartan may inhibit the proliferation of vascular smooth muscle and collagen accumulation, and prevent salt-induced hypertension and arterial remodelling.

**GW23-e2629**

THE EFFECTS OF LONG-TERM HIGH-SALT DIET ON BLOOD PRESSURE AND KIDNEY IN WISTAR RATS AND THE INTERVENTION OF TELMISARTAN
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Objectives To investigate the effects of long-term high-salt diet on blood pressure and kidney and the intervention of telmisartan.

Methods Wistar rats were randomly divided into three groups: Control group (NS group: given 0.5% NaCl), High-salt group (given 8% NaCl), and Intervention group (GY group: given 8% NaCl+telmisartan). Systolic blood pressure was assessed by the tail-cuff artery pressure. The urine was collected to measure the concentration of Na+, K+, microalbumin, total protein, and creatinine. At 24 weeks, the renal hypertrophy index was calculated. HE, Masson staining were used to observe the kidney morphology.

Results Compared with NS group, systolic blood pressure was significantly increased and continued until the end of the experiment in one part of rats fed high-salt diet, whereas the other part of rats fed high-salt diet developed transient increase in blood pressure only from 8 weeks to 10 weeks of the experiment. So high-salt group rats were finally divided into High-salt hypertension group (HH group) and High-salt normal blood pressure group (HN group). In high-salt group rats, the renal hypertrophy index, microalbumin, total protein, and the ratio of Na+/K+ were increased (p<0.01), creatinine clearance rate was decreased (p<0.01), but the real damage in HN group was lighter than that in HH group. In GY group, systolic blood pressure was decreased, and the content of microalbumin, and total protein was reduced (p<0.01), renal damage was ameliorated, but the renal hypertrophy index, creatinine clearance, and the ratio of Na+/K+ did not change (p>0.05).

Conclusions Long-term high-salt diet may induce high blood pressure in part of the Wistar rats and cause renal damage independent of high blood pressure. Telmisartan can prevent high blood pressure and renal damage induced by high-salt diet in Wistar rats.

**GW23-e0802**

EFFECTS OF LOW DECIBEL INFRASOUND ON CARDIAC FIBROSIS OF RATS WITH ACUTE MYOCARDIAL INFARCTION AND UNDERLYING MECHANISM
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Objectives To observe the changes of cardiac fibrosis and its underlying mechanism after acute myocardial infarction in rats.

Methods Thirty male Sprague Dawley (SD) rats were randomised to control group, infarction group and infrasound treatment group, with 10 rats in each group. The rats in the infrasound treatment group were treated with infrasound for 7 days, 0.5 h, 2/days. The collagen expression of rat myocardium, the contents of NO and Ang-II in rat plasma and the rat heart function were observed.

Results Compared with those in the infarction group, the contents of NO in rat plasma significantly decreased (p<0.01), the contents of ET-1 in rat plasma significantly increased (p<0.01), and the heart function was significantly improved.

**GW23-e0564**

_α_-CALPAIN MEDIATES MYOCARDIAL APOPTOSIS DURING ISCHAEMIA-REPERFUSION VIA MITOCHONDRIAL PERMEABILITY TRANSITION PORE OPENING
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Objectives Calpains have been implicated in myocardial ischaemia-reperfusion (I/R) injury. The mitochondrial permeability transition pore (mPTP) subsequently triggers apoptotic cell death during I/R. However, the mechanistic link among calpain activity, mPTP opening and apoptosis in myocardium during I/R remains to be elucidated.

Aim This aim of this study was to investigate whether the activation of calpain in I/R cardiomyocytes is associated with alterations in mPTP and subsequent apoptotic cell death.

Methods Primary cultured neonatal mouse cardiomyocytes were deprived of oxygen and glucose to simulate ischaemia, and restored oxygen and sugar supply to simulate reperfusion (simulated I/R injury). To determine the influence of calpain activity on mPTP and apoptosis, cells were pretreated with PD150606 (PD, a specific calpain inhibitor). Apoptosis in cardiomyocytes was determined by TUNEL-staining and caspase-3 activity analysis. To identify the activated calpain isoform implicated in myocardial I/R injury, the autolysis of the N-terminal domains of the catalytic subunit of m- and _α_-calpain in cardiomyocytes were detected by immunoblot analysis. mPTP opening in cardiomyocytes was assessed by using the calcein–cobalt method and mitochondrial membrane potential (Δψm) by imaging cells loaded with JC-1.

Results Reperfusion following ischaemia, rather than ischaemia, led to the autolysis of the N-terminal domains of the catalytic subunit of m-calpain in cardiomyocytes. However, the autolysis of the N-terminal domains of the catalytic subunit of m-calpain in cardiomyocytes was not observed in the investigation. The percentage of TUNEL-positive cardiomyocytes and caspase-3 activity was significantly less in the PD (20.38%±2.23% and fold of changes, 1.43±0.13) compared with the untreated I/R (31.48%±1.65% and fold of changes, 2.21±0.17) group. Moreover, PD pre-treatment of cardiomyocytes dramatically suppressed the opening of mPTP and the loss of Δψm caused by I/R.

Conclusions Myocardial I/R can lead to the activation of m-calpain, which subsequently triggers apoptotic cell death by inducing mPTP opening.
Conclusions Infrasound treatment significantly assuages the cardiac fibrosis of rats after myocardial infarction, which may be relative with the changes of NO and Ang-II.

GW23-e2099 INOS/NO ACTS AS TRIGGERS AND EFFECTORS IN THE MECHANISMS OF LTA PROTECTION AGAINST MYOCARDIAL ISCHAEMIA/REPERFUSION INJURY IN SPONTANEOUS HYPERTENSIVE RAT

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Objectives To explore the effects of lipoteichoic acid (LTA) induced delayed preconditioning on myocardial ischaemia/reperfusion injury (I/R) in spontaneous hypertensive rat (SHR) and whether iNOS/NO were participated the mechanisms.

Methods I/R model was induced by left anterior descending coronary artery ligation for 30 min, followed by 60 min reperfusion. Myocardial apoptosis on the left ventricle at the end of reperfusion were detected by TUNEL staining in situ, and the changes of Bcl-2 and Bax protein, were detected by western blot. Meanwhile, the expression of iNOS mRNA and protein of left ventricle were detected.

Results Pretreated with LTA (1 mg/kg) 24 h before the experiment could obviously decrease ventricular arrhythmia and reduce CK-MB and LDH release in serum during ischaemia and reperfusion. LTA preconditioning significantly decreased myocardial apoptosis index and the expression of Bax protein was obviously decreased but markedly increased the expression of Bcl-2 protein. The mean relativity expression of iNOS mRNA in LTA preconditioning group was increased 0.71 times and the expression of iNOS protein was increased 0.96 times compared with that of in I/R group. There are no deceptions no matter pretreatment of the rats with the inhibitor of iNOS, aminoguanidine (AG) before LTA preconditioning, or 30 min before ischaemia or pretreatment with AG alone.

Conclusions LTA induced delayed preconditioning could obviously decreases myocardial necrosis and apoptosis induced by I/R in SHR, iNOS/NO acts as triggers and subsequently as effectors play a key role in the mechanisms of LTA protection.

GW23-e2158 THE STUDY OF BONE MARROW MESENCHYMAL STEM CELLS GENE MODIFIED BY RECOMBINANT ADENO-ASSOCIATED VIRUS-9 COMBINED WITH PDGF-B IN VITRO

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Objectives To explore the feasibility, stability and safety of using recombinant adeno-associated virus-9 which contained platelet-derived growth factor-B (rAAV9-PDGF-B) transduction to bone marrow mesenchymal stem cells in vitro.

Methods Bone marrow mesenchymal stem cells (MSCs) were transduced with rAAV9-eGFP at MOI=1×10⁶, and GFP expression was detected by converted fluorescence microscope. Experimental group: MSCs were transduced with rAAV9-PDGF-B, control group: MSCs were untreated. Collected stem cells from different times after transduction, respectively at 3 days, 6 days, 14 days, 21 days, 28 days. Proteins were extracted from the cells for Western blot analyse and observed the expression of PDGF-B, the transfection efficiency of after transduction 6 days and 21 days were measured by cell immunofluorescence. Alamar Blue assays were used to evaluate the safety of rAAV9-PDGF-B transduction to cardiomyocytes.

Results After transduction (rAAV9-eGFP) 48 h, only individual cells own GFP, however the expression of GFP was gradually enhanced, 5–6 days reached a peak, and then GFP expression was began to fade. Cells of control group did not found the expression of PDGF-B, cells of experimental group were expressed PDGF-B after transduction 3 days (PDGF-B/GAPDH=15.6±1.1%), after 6 days reached a peak (63.7±2.7%), after 14 days (46.6±1.1%), after 21 days (34.5±1.2%), after 28 days (34.4±1.9%). By Statistical Analysis, the expression of PDGF-B in control group compared to experimental group p<0.01. Compared to each times in experimental group, PDGF-B level in 3 days was lower than other times, the level of 6 days was the highest. Moreover, there was no statistical significant difference between the level of 21 days and 28 days (p=1.0). Cell immunofluorescence showed that the transfection efficiency of after transduction 6 days and 21 days, was 65.7±2.6% and 39.6±1.8% （p<0.01), the transfection efficiency of 6 days was higher than 21 days. Alamar Blue assays, which evaluated the toxicity of rAAV9-PDGF-B transduction to MSCs, showed that the reduction ratios of cardiomyocytes at different times were all close to 1.0, there was no statistical significant difference in each times.

Conclusions rAAV9-PDGF-B could effectively transduce MSCs cultured in vitro and persistently express PDGF-B gene at least 28 days. Furthermore, rAAV9-PDGF-B was no significant toxic effects on MSCs.

GW23-e2482 ELECTRICAL CHARACTERISTICS OF RAA AND LAA IN 48 H AF CANINE WITH MEA CHIP TECHNIQUE

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Objectives To explore electrical characteristics of RAA and LAA in 48 h AF canine with MEA chip technique.

Methods Twelve adult healthy mongrel canine were randomly divided into two groups: pacing group and control group. The morphology, duration, voltage, discharge frequency and conduction of field potential were recorded.

Results In AF group, the rhythm of LAA and RAA tissue field potential were irregular, LAA increased in the percent of 15.67%, RAA decreased in the percent of 34.62% than the control group. The voltage of LAA and RAA decreased than the control group, the duration of field potential of LAA and RAA shortened than control group. Electricity impulse represents anisotropic alteration.

Conclusions MEA is sensitive, long time and stable and local tissue action potential multiple-channel recording mapping system in animal heart slices. The discharge frequency of left atrial appendage increased after 48 h AF, frequency irregularity, the voltage of field potential decreased in atrial appendage, field potential duration increased.

GW23-e2194 IMPACT OF DIABETES MELLITUS ON CORONARY ARTERY SPASM

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Objectives Both diabetes mellitus and coronary artery spasm (CAS) are associated with endothelial dysfunction. Thus, a higher
incidence of CAS is expected in diabetic patients.

We evaluated the impacts of diabetes mellitus (DM) and the status of blood sugar control on CAS with intracoronary acetylcholine (ACH) provocation test.

**Methods** A total of 936 patients (106 diabetic vs 880 non-diabetic patients) with angiographically normal coronary artery received ACH provocation test.

Significant CAS was defined as a transient >90% luminal narrowing with concurrent chest pain and/or ST-segment changes. HbA1c <7% was considered controlled blood sugar level.

**Results** The incidence of CAS was similar between patients with versus without DM (30.2% vs 23.5%, p=0.130). The incidence of CAS was similar between diabetic patients with versus without controlled blood sugar levels (35.4% vs 25.9%, p=0.286). Multivariable analysis showed that DM was not an independent risk factor for significant CAS (OR 1.29, 95% CI 0.81 to 2.07, p=0.280).

The angiographic characteristics of CAS were also similar between these two groups. Subgroup analysis regarding the impact of the status of blood sugar control on CAS showed that the incidence of CAS were similar between diabetic patients with versus without controlled blood sugar levels (35.4% vs 25.9%, p=0.286). Multivariable analysis showed that the uncontrolled blood sugar levels was not an independent risk factor for CAS (OR 0.79, 95% CI 0.29 to 2.13, p=0.640).

**Conclusions** Despite the expected endothelial dysfunction, DM and the status of blood sugar control, are not associated with CAS suggesting the existence of different mechanisms for CAS and coronary artery disease.
GW23-e1211 MONGOLIAN AND HAN NATIONALITY RIGHT FEMORAL ARTERY BIFURCATION ANALYSIS BY ANGIOGRAPHY

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Objectives To analyze the variation of Mongolian and Han nationality in the site of femoral artery bifurcation relying on the femoral head and the pubic symphysis.

Methods Methods we retrospectively analyzed 540 patients underwent cardiac catheterizations via femoral artery angiograms. The femoral head and midpoint of pubic symphysis were used as landmarks, the inferior margin, midpoint and superior margin of the femoral head were used as borders to divide the inguinal region into A, B1, B2, and C four zones. The sites of femoral artery bifurcation and common femoral artery were evaluated using angiography.

Results The percentage of femoral artery bifurcations locating in the area of A, B1, B2, and C among Mongolian Nationality was 5.1%, 29.4%, 44.3%, and 21.2%, respectively. The percentage of femoral artery bifurcations locating in the area of A, B1, B2, and C among Han Nationality was 1.2%, 26.5%, 32.7%, and 39.8%, respectively. When arterial puncture located on zone B1, B2, and C, common femoral artery puncture success rate in Mongolian Nationality was 94.9%, 86.7%, and 75.2%, in Han Nationality was 91.4%, 82.3%, and 57.8%, respectively. The puncture related complication was 11.2% and 2.1% in Mongolian and Han Nationality.

Conclusions The majority of femoral artery bifurcation was located below the midpoint of femoral head in our 540 cases, but the Han Nationality patients femoral artery bifurcation was more superior than the Han Nationality patients. So the common femoral artery puncture in Mongolian Nationality patients should be higher than midpoint femoral head to avoid puncture related complication.

GW23-e1707 IS ZINC CRITICAL FOR MYOCARDIAL REPERFUSION INJURY?

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Objectives The purpose of this study was to investigate the role intracellular free zinc in myocardial reperfusion injury.

Methods Isolated perfused rat hearts were subjected to 30 min ischaemia followed by 2 h of reperfusion. Myocardial infarct size was measured with TTC. Cardiac tissue zinc levels were measured with ICP-MS. Western blotting analysis was used to probe intracellular signalling events. Cardiac H9c2 cells were subjected to hypoxia/reoxygenation and zinc transporter mRNA expression levels were detected with RT-PCR.

Results Cardiac zinc levels were dramatically decreased upon reperfusion in rat hearts and this was prevented by the adenosine A2 receptor agonist NECA. NECA given at reperfusion reduced infarct size, an effect that was blocked by the zinc chelator TPEN. Ischaemic post-conditioning consisted of 6 cycles of 10 s ischaemia and 10 s reperfusion also prevented cardiac zinc loss at reperfusion and TPEN abolished the anti-infarct effect of postconditioning. In H9c2 cells, reoxygenation caused cellular zinc loss and enhanced mRNA expression of the zinc importer Zip2. Down-regulation of Zip2 expression with its siRNA exacerbated hypoxia/reoxygenation injury.

Conclusions Cellular zinc loss upon reperfusion accounts for the pathogenesis of myocardial reperfusion injury and prevention of zinc loss leads to cardioprotection against reperfusion injury. Increase in Zip2 expression at reperfusion may serve as an important protective mechanism by which cardiac cells are resistant to reperfusion injury.

GW23-e0619 HEPATOCYTE GROWTH FACTOR GENETICALLY MODIFIED BONE MARROW-DERIVED MESENCHYMAL STEM CELLS TRANSPANTATION PROMOTES ANGIGENESIS IN A RAT MODEL OF HINDLIMB ISCHAEMIA

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Objectives Angiogenic gene therapy and cell-based therapy for peripheral arterial disease (PAD) have been studied intensively

5. There were no significant arrhythmia by administration at a dosage of 0.287 mg/kg. The rabbit developed the frequent occurrence of cardiac isoform of the plasma membrane Ca-A TPase (PMCA4b).
currently. This study aimed to investigate a new strategy whether combining mesenchymal stem cells (MSCs) transplantation with ex vivo human hepatocyte growth factor (HGF) gene transfer was more therapeutically efficient than the MSCs therapy alone in a rat model of hindlimb ishaemia.

**Methods** One-week after establishing hindlimb ishemia models, Sprague-Dawley rats were randomised to receive HGF gene-modified MSCs transplantation (HGF-MSC group), untreated MSCs transplantation (MSC group), or PBS injection (PBS group), respectively.

**Results** Three-weeks after injection, angiogenesis was significantly induced by both MSCs and HGF-MSCs transplantation, and capillary density was the highest in the HGF-MSC group. The number of transplanted cell-derived endothelial cells was greater in HGF-MSC group than in MSC group after 1 week treatment. The expression of angiogenic cytokines such as HGF and VEGF in local ischaemia muscles was more abundant in HGF-MSC group than in the other two groups. In vitro, the conditioned media obtained from HGF-MSCs cultures presented proproliferative and promigratory effects on endothelial cells.

**Conclusions** HGF gene-modified MSCs transplantation therapy may induce more potent angiogenesis than the MSCs therapy alone. Engraftment of MSCs combined with angiogenic gene delivery maybe a promising therapeutic strategy for the treatment of severe PAD.
ABSTRACTS

GW23-e0847 DEFICIENCY OF INSULIN-LIKE GROWTH FACTOR 1 REDUCES VULNERABILITY TO CHRONIC ALCOHOL INTAKE-INDUCED CARDIOMYOCYTE MECHANICAL DYSFUNCTION: ROLE OF AMPK

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Objectives Circulating insulin-like growth factor I (IGF-1) levels are closely associated with cardiac performance although the role of IGF-1 in alcoholic cardiac dysfunction is unknown. This study was designed to evaluate the impact of severe liver IGF-1 deficiency (LID) on chronic alcohol-induced cardiomyocyte contractile and intracellular Ca2+ dysfunction.

Methods Adult male C57 and LID mice were placed on a 4% alcohol diet for 15 weeks. Cardiomyocyte contractile and intracellular Ca2+ properties were evaluated including peak shortening (FS), maximal velocity of shortening/relengthening (+dL/dt), time-to-relengthening (TR90), change in fura-fluorescence intensity (AFFF) and intracellular Ca2+ decay. Levels of apoptotic regulators caspase-3, Bcl-2 and c-Jun NH2-terminal kinase (JNK), the ethanol metabolising enzyme mitochondrial aldehyde dehydrogenase (ALDH2), as well as the cellular fuel gauge AMP-activated protein kinase (AMPK) were evaluated.

Results Chronic alcohol intake enlarged myocyte cross-sectional area, reduced FS, ±dL/dt and AFFF as well as prolonged TR90 and intracellular Ca2+ decay, the effect of which was greatly attenuated by IGF-1 deficiency. The beneficial effect of LID against alcoholic cardiac mechanical defect was ablated by IGF1-replenishment. Alcohol intake increased caspase-3 activity/expression although it downregulated Bcl-2, ALDH2 and pAMPK without affecting JNK and AMPK. IGF-1 deficiency attenuated alcoholism-induced responses in all these proteins with the exception of Bcl-2. In addition, the AMPK agonist 5-aminoimidazole-4-carboxamide-1-beta-D-ribofuranoside abrogated short-term ethanol incubation-elicited cardiac mechanical dysfunction.

Conclusions Taken together, these data suggested that IGF-1 deficiency may reduce the sensitivity to ethanol-induced myocardial mechanical dysfunction. Our data further depicted a likely role of Caspase-3, ALDH2 and AMPK activation in IGF-1 deficiency induced ‘desensitisation’ of alcoholic cardiomyopathy.

GW23-e0718 MECHANISM OF INCREASED EXPRESSION OF INFLAMMATORY FACTOR IN ENDOTHELIAL CELLS AS IT IS INCUBATED IN D-GLUCOSE

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Objectives To study the mechanism for increased expression of inflammatory factor in endothelial cells as it is incubated in D-glucose.

Methods The human umbilical vein endothelial cells (HUVECs) that isolated from newborn umbilical cord were cultured and verified as vascular endothelial cells by immunohistochemistry in vitro. Passage 2 cells were stimulated by D-glucose with different concentration and time respectively. Levels of ROS were studied with flow cytometry and MCP-1 mRNA expression was assayed by reverse-transcription PCR (RT-PCR).

Results Formation of ROS and transcript of MCP-1 were increased gradually as the HUVECs were incubated by high D-glucose, although there were no significant changes in 5.5 mmol/l group at different time point. 16.5 mmol/l and 25.0 mmol/l glucose significantly increased the formation of ROS within 24 h (p<0.01) in cultured HUVECs. The levels of ROS in 25.0 mmol/l group were higher than that in 16.5 mmol/l group as the HUVECs were treated for 12 h (p<0.05). The expression of MCP-1 increased slowly as the HUVECs were exposed to high concentration of glucose. But significant increase of MCP-1 expression were emerged in 25.0 mmol/l group as compare to 5.5 mmol/l group within 12 h (p<0.05) and 16.5 mmol/l group within 24 h (p<0.05), respectively.

Conclusions HUVECs will produce more ROS and other metabolic products as it incubated in D-glucose, which links the damage and dysfunction of VECs to D-glucose and cytokines around intima. Reinforced expression of MCP-1 is the important mechanism which leads to the damage and dysfunction of VECs.

GW23-e1686 THE EFFECT OF BERBERINE ON ARRHYTHMIA CAUSED BY STRETCH OF ISOLATED MYOCARDIAL INFARCTED HEARTS IN RATS

doi:10.1136/heartjnl-2012-302920a.220

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Objectives To study the effect of berberine on arrhythmia caused by stretch of isolated myocardial infarcted (MI) hearts in rats.
Conclusions

Berberine has no influence on MAPD90 of normal control group (p>0.05), while it could reduce the lengthened MAPD90 after stretched (p<0.01). And MAPD90 in MI group was even longer than that of normal control group (p<0.01). Berberine has no influence on MAPD90 of basic condition (p>0.05), while it could reduce the lengthened MAPD90 after stretched (p<0.05 or p<0.01). The incidence rate of FVB and VT in normal control and MI group increased after stretched. 300 μmol/l berberine could reduce the incidence rate of FVB, and obviously obstruct the occurrence of VT (p<0.01).

GW23-e2010

EXPRESSION OF MICRORNA-122 CONTRIBUTES TO APOPTOSIS IN H9C2 MYOCYTES

do i:10.1136/heartjnl-2012-302920a.221

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Objectives

The microRNAs (miRNAs) can post-transcriptionally regulate gene expression and heart development. Pax-8 gene knockout mice have apparent heart abnormalities. This study investigated the role of miRNAs in regulation of cardiac apoptosis and development in the knockout mice.

Methods

miRNA microarrays demonstrated differential expression of microRNAs between Pax-8−/− and Pax-8+/− mice, confirmed by real-time PCR.

Results

miR-122 was up-regulated by 1.92 folds in Pax-8−/− mice. There were ventricular septum defects in Pax-8−/− mice, and increased numbers of apoptotic cells in the left ventricular wall and interventricular septum in Pax-8−/− mice. In H9C2 myocytes, treatment with miR-122 mimics or miR-122 inhibitor affect the expression of CCK-8 and activity of Caspase-3.

Conclusions

The miR-122 is upregulated in the myocytes of Pax-8−/− mice and may participate in the apoptotic gene expression and pathogenesis of heart development defect.

GW23-e1898

ATORVASTATIN DELAY THE SENESCENCE OF VASCULAR ENDOTHELIAL CELL INDUCED BY ANGIOTENSINII THROUGH REGULATING THE EXPRESSION OF BCL-2/BAK PROTEIN

do i:10.1136/heartjnl-2012-302920a.223

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Objectives

To explore the effects of Atorvastatin on the senescence in human umbilical vein endothelial cells (HUVECs) induced by AngiotensinII (AngII) and to study its potential molecular mechanism.

Methods

The HUVECs were cultured in vitro and divided into three groups, the control group, AngII group (stimulated with intervention by AngII 10−6 mol/l for 48 h), Atorvastatin group (10−5 mol/l Atorvastatin was added to cell 1 h before 10−6 mol/l AngII). B-Gal stain and cell cycle analysis were used to identify cell aging status; and the expression of apoptosis-association genes Bcl-2 and Bax were detected by immunocytochemistry and Western-blottting.

Results

Atorvastatin stimulation enhanced the positive cell number of B-Gal and decreased the expression of Bcl-2 and Bax.

GW23-e1896

EFFECT OF ERK1/2 SIGNAL TRANSDUCTION PATHWAY IN VASCULAR ENDOTHELIAL CELL APOPTOSIS

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Objectives

To explore the changes in extracelluar signal-regulated protein kinase (ERK1/2) in endothelial cell senescence induced by AngiotensinII at the different time courses, and its possible molecular mechanism.

Methods

Human umbilical vein endothelial cell (HUVEC) were cultured in vitro and intervened by AngII. HUVECs were divided into two groups, the control group, AngII group (stimulated by AngII 10−6 mol/l for 48 h). Human HUVECs were cultured in vitro and intervened by AngII. The cell living rate was observed by methyl thiazolyl tetrazolium (MTT), B gal staining and cell cycle analysis were used to identify cell aging status. Cell senescence was used to study by transmission electric microscopy. The expressions of apoptosis-association genes Bcl-2, Bax were detected by immunocytochemistry and ERK1/2 levels were detected by Western-blottting at different time points.

Results

10−6 mol/l AngiotensinII stimulation stimulated cell senescence. The cell living rate by AngII-induced cells was (81.9% ± 4.1%, p<0.01), the positive cell number of B-gal staining was significantly higher in AngII-induced cells than that in the control cells (80.10%±6.81% vs 0.18%±0.04%, p<0.01); the cell cycle was at G0-G1 (91.36%±6.45%, p<0.01), S phase and G2/M phase were a tendency to disappearance in AngII-induced cells (6.62%±0.42% vs 2.12%±0.35%, p<0.01), the senescent cells significantly increased under transmission electric microscopy. Bcl-2 mRNA levels were time-dependently decreased, the radio of Bcl-2/Bax was decreased markedly p<0.05). Phosphorylation of ERK1/2 began to increase and reach the peak at 24 h p<0.01).
**Conclusions** Atorvastatin probably delay the senescence of vascular endothelial cell induced by AngII through regulating the expression of Bcl-2/Bax protein.

**GW23-e1885**  
THE ROLE OF TRB3 IN CARDIAC ENDOPLASMIC RETICULUM STRESS

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**Objectives** TRB-3 (tribbles 3), also called NIFK (neuronal cell death-inducible protein kinase) disrupts insulin signalling by binding to Akt and blocking their activation. TRB3 expression is highly regulated in many cell types, endoplasmic reticulum (ER) stress promotes TRB3 expression in cardiac cells. This work was to examine TRB3 expression and function in cultured cardiac myocytes and in mouse heart.

**Methods** Cultured HL-1 murine atrial cardiac myocytes were treated with thapsigargin and stimulated with insulin. HL-1 cells were treated with thapsigargin (2 μM), and 24 h later cells were treated with insulin (10 nM) or control buffer and Akt activation was examined by Western-blotting with an anti-phospho-Akt antibody.

**Results** Thapsigargin-treated HL-1 cells were resistant to insulin-stimulated Akt activation, and exhibited increased protein levels for GRP78 and CHOP. Some agents induced ER stress increased TRB3 expression in cultured cardiac myocytes while blocking Akt activation in these cells. Experimental myocardial infarction led to increased TRB3 expression in murine heart tissue in the infarct border zone and increased levels of GRP78 protein were detected, pressure overload by transverse aortic constriction in mice resulted in cardiac ER stress, detected increasing levels of GRP78 and CHOP. ER stress may play a role in pathological cardiac remodelling. Transgenic TRB3 mice were also sensitised to infarct expansion and cardiac myocyte apoptosis in the infarct border zone after myocardial infarction.

**Conclusions** These results demonstrate that TRB3 induction is a significant aspect of the ER stress response in cardiac myocytes. Cardiac ER stress leads to TRB3 induction, Akt inhibition and cardiac myocyte death. Cultured cardiac myocytes exhibited reduced Akt activity dependent on increased expression of TRB3. Experimental myocardial infarction in mice resulted in the induction of TRB3 and other ER stress markers in the infarct border zone. TRB3 antagonises cardiac glucose metabolism and cardiac myocyte survival.

**GW23-e1249**  
ROSVASTATIN ENHANCES VIABILITY OF ADIPOSE-DERIVED MESENCHYMAL STEM CELLS TRANSPLANTED IN POST-INFARCTED MOUSE HEARTS

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**Objectives** The aim of this study was to investigate whether rosuvastatin improved survival of adipose-derived mesenchymal stem cells (AD-MSCs) after transplantation into infarcted hearts.

**Methods** AD-MSCs were isolated from transgenic mice, which were created on the FVB background to constitutively express firefly luciferase and enhanced green fluorescence protein (Fluc-eGFP). Myocardial infarction was created in mice by coronary ligation, AD-MSCs were transplanted into the hearts of MI mice and Rosuvastatin or vehicle (saline) was administered by gavage. Transplanted ASCs were tracked by longitudinal in vivo bioluminescence imaging (BLI). Three-weeks after transplantation, cardiac function and structure were evaluated by serial echocardiography and histology. For mimic the ischaemic environment, AD-MSCs were subjected to hypoxia and serum deprivation (H/SD) injury in vitro. AD-MSCs survival and proliferation were assessed by BLI and MTT assays. Cells apoptosis was determined by TUNEL staining and caspase 3 activity assay. The expressions of Akt, phosphorylated Akt (pAkt), ERK1/2 and phosphorylated ERK1/2 (p ERK1/2) were detected by Western blot.

**Results** In vivo, BLI indicated that rosuvastatin enhanced the survival of engrafted AD-MSCs at day 7 and 14 after cell transplantation. Furthermore, combined therapy of AD-MSCs and rosuvastatin preserved heart function, reduced fibrosis, decreased apoptotic cardiomyocytes. In vitro, the results showed that rosuvastatin (10−8 mmol/l) enhanced the viability of AD-MSCs and decreased their apoptotic rate. Western blot revealed that rosuvastatin supplementation increased Akt and ERK phosphorylation significantly and that this effect was abolished by addition of the PI3K inhibitor LY294002 and the MEK1/2 inhibitor U0126.

**Conclusions** Combination therapy with rosuvastatin and AD-MSCs has a synergetic effect on improving myocardial function after infarction. The possible mechanism of rosuvastatin improve the survival of engrafted AD-MSCs in infarcted hearts may be associated with the PI3K/Akt and ERK1/2 signalling pathways.

**GW23-e1340**  
COMPARISON OF ASPIRIN COMBINED NAOXINTONG VERSUS ADJUSTED-DOSE WARFARIN IN ELDERLY PATIENTS WITH HIGH-RISK NON-VALVULAR ATRIAL FIBRILLATION AND GENETIC VARIANT OF VKORC1

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**Objectives** Adjusted-dose warfarin and aspirin reduce stroke in patients with atrial fibrillation, and warfarin is substantially more efficacious than aspirin. But patients especially in Chinese population with genetic variants of vitamin K epoxide reductase (VKORC1), who received warfarin had more than as many hemorrhages than those who received aspirin.

**Objective** To compare between aspirin combined BNC versus adjusted-dose warfarin in more than 65 years of age patients with high-risk non-valvular atrial fibrillation (NVAF) and genetic variants of VKORC1.

**Methods** 151 patients with NVAF and the allelic mutation of VKORC1 gene-1639G>A and a CHADS2 score of 2 and above were randomly divided into two groups. One group was warfarin maintenance dosing adjustment nomogram for INR goal of 2–3, the other group was aspirin (100 mg/d) combined BNC (1.6 g thrice daily) as antithrombotic drug. All drugs were taken at least 1 year and clinical events (ischaemic stroke, haemorrhage, death) were followed up.

**Results** Baseline clinical data were similar in both groups. Ischaemic stroke and the all-cause death did not significant difference between two groups. The serious bleeding rate of the combined group was less than that of the adjusted-dose warfarin group (0% vs 7.9%, OR=0.921, 95% CI 0.862 to 0.984, p=0.028).

**Conclusions** Aspirin combined BNC and the adjusted-dose warfarin was equally effective in elderly patients with NVAF for prevention of ischaemic stroke. The combination therapy could reduce the risk of the antithrombotic drug therapy-associated bleeding.
GW23-e1254  
**EFFECTS OF XERODERMA PIGMENTOSUM B GENE ON PROLIFERATION AND APOPTOSIS CONDUCTED BY INTERLEUKIN-6 IN VASCULAR SMOOTH MUSCLE CELLS**

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**Objectives** Excessive proliferation vascular smooth muscle cells (VSMC) can promote the development of atherosclerosis. And, in the development of atherosclerosis, interleukin-6 (IL-6) enhance excessive proliferation of VSMC. As studies have showed, up-regulation of xeroderma pigmentosum B (XPB) gene could induce apoptosis of a variety of cells. However, it has not been reported whether there is any effect of XPB on proliferation and apoptosis of VSMC. To investigate effects of XPB on proliferation induced by IL-6 in human VSMC and its association with atherosclerosis, this study was carried out.

**Methods**
1. Recombinant plasmid pcDNA3.1-XPB and vacant vector plasmid pcDNA3.1 were transfected stably into VSMC by liposome, and these cells were incubated with IL-6 at a 100 U/ml concentration for 48 h. The experiments were divided into six groups: blank control group; pcDNA3.1 group; pcDNA3.1-XPB group; IL-6 group; IL-6+pcDNA3.1 group; IL-6+pcDNA3.1-XPB group.
2. Through RT-PCR and Western blot, the expression levels of IL-6 in human VSMC and its association with atherosclerosis, this study was carried out.

**Results**
1. RT-PCR results and Western blot results showed that the transfection of pcDNA3.1-XPB increased the expression of XPB, Bax and wt-p53 p<0.05 or p<0.01), decreased the expression of Bcl-2 (p<0.05 or p<0.01), and reduced the effects that IL-6 decreased the expression of Bax and wt-p53, increased the expression of Bcl-2 p<0.05 or p<0.01).
2. MTT results showed that overexpression of XPB inhibited the cell growth p<0.05), and reduced the positive effects of IL-6 on VSMC growth p<0.05).
3. Flow cytometry results showed that overexpression of XPB increased the survival rate of VSMC p<0.01) and the cell amounts of G0/G1 phase p<0.05), decreased the cell amounts of S phase p<0.05), and reduced the effects that IL-6 decreased the survival rate of VSMC and the cell amounts of G0/G1 phase, increased the cell amounts of S phase (P respectively<0.01).

**Conclusions** XPB gene can inhibit VSMC proliferation, promote VSMC apoptosis, and reduce the effects that IL-6 promotes VSMC proliferation and inhibits VSMC apoptosis. Therefore, XPB gene is likely to be potential molecular target for treatment of atherosclerosis.

GW23-e1387  
**SONODYNAMIC EFFECT OF BERBERINE ON MACROPHAGES**

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**Objectives** Atherosclerosis (AS) is the major contributing factor that results in acute cardiovascular events, which leading to the high mortality of cardiovascular diseases, which. The pathophysiological mechanism of atherosclerosis remains unknown. Recently, many researchers implicated that infiltration of inflammatory cell involving macrophage played a critical role in vulnerable plaque. Sonodynamic therapy (SDT) that targets at the inflammatory mechanism of atherosclerosis is a new promising treatment. Berberine, extracted from traditional herbs copies, has been used as an anti-inflammatory agent in clinical practice. Whether it could be applied as a novel sonosensitizer for sonodynamic therapy (SDT) to treat atherosclerosis deserves further exploration. So, in this study, we investigated the effect of berberine-mediated sonodynamic therapy on macrophage within atherosclerotic plaque.

**Methods** Absorption spectrum and fluorescent emission spectrum of Berberine were measured. (2) Effect of Berberine at different concentration on the cell viability of THP-1 derived macrophages was examined. (3) The intracellular uptake of Berberine by macrophages was detected by a fluorescence microscope. (4) THP-1 derived macrophages were cultured with Berberine at a concentration of 15 g/ml for 2 h and then exposed to pulse ultrasound irradiation (2 W/cm2 with 0.86 MHz) for 5–15 min. Six-hours later, Cell viability analysis was performed by MTT assay. (5) Six-hours after Berberine-SDT for 15 min, the nuclei were stained with Hoechst 33342 to determine apoptosis and with PI to determine necrosis. (6) Two-hours after Berberine-SDT for 15 min, morphological changes of the cytoskeleton were examined through immune fluorescence. Data were expressed as means±SD and analysis of ANOVA was performed for individual comparisons.

**Results** The absorption wavelength of Berberine was less than 500 nm. (2) Berberine was distributed in cytoplasm. (3) Six-hours...
after treatment with Berberine-SDT for 5–15 min, unlike the cells treated with Berberine-SDT for 5 and 10 min, the viability of cells treated with Berberine-SDT for 15 min decreased significantly. And cell viability in SDT group was lower than that in ultrasound group (48.4%±5.0% vs 72.5%±6.9%, p<0.01). Six-hours after treatment with Berberine-SDT for 15 min the cells showed a typical apoptotic chromatin fragmentation. In addition, the percentage of apoptotic and necrotic cells in SDT group was higher than that in ultrasound alone group (apoptosis: 31.7±5.7% vs 25.9±6.2%, p<0.05; necrosis: 16.5±5.3% vs 4.5±1.8%, p<0.01). (6) Two-hours after treatment with Berberine-SDT for 15 min, the cytoskeleton lost its original features as the filaments dispersed and the cytoskeletal proteins aggregated. Some cells even suffered deformations as blebs. The percentage of cells with disturbed cytoskeletal filaments in SDT group was higher than that in ultrasound group (α-actin: 49.3±4.2% vs 32.1±4.5%, p<0.01; β-tubulin: 43.1±6.8% vs 27.8±6.4%, p<0.01; vimentin: 40.8±5.0% vs 29.6±7.1%, p<0.01).

Conclusions The results suggested that Berberine was a novel sono-sensitizer. Berberine-SDT could inhibit cell viability of macrophages, induce apoptosis and necrosis of macrophages, and lead to cleavage of cytoskeleton. Berberine-SDT could be used as a novel treatment to atherosclerosis.
investigation with larger volume focusing on the biological Significances of PON-1 genotype should be encouraged.

**GW23-e2606**  
**EFFECTIVE OF HIGH-SALT DIET ON THE REMODELLING OF CAROTID ARTERIES AND THE INTERVENTION OF TELMSARTAN IN WISTAR RATS**  
doi:10.1136/heartjnl-2012-302920a.233

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**Objectives** To study the influence of high salt diet on blood pressure and carotid artery remodelling and the intervention of telmisartan in Wistar rats.

**Methods** 60 Wistar rats were fed a normal salt diet (Control group, 0.5%NaCl), high salt diet (M group: 8% NaCl), and high salt diet +Telmisartan (Tel group, 8% NaCl + Telmisartan) until 24 weeks. After the end of experiment, M group was divided into hypertension group (MH) and normal blood pressure group (MN) according to the tail-cuff blood pressure. The structural changes and proliferation in the media of carotid artery were observed by HE staining, Masson staining and immunohistochemical. Expression of TGF-β, smad2/3, smad7, AngII, AT1 and AT2 in media of carotid artery were measured with immunohistochemistry method. Aldosterone in vessel was measured by radioimmunoassay.

**Results** (1) Media thickness (MT), ratio of media to lumen (MT/LD), proliferation index (PI), collagen fibre area percentage of carotid arteries in MH and MN groups were increased compared with that of the control group p<0.01). But MT, MT/LD, PI, the collagen volume fraction in Tel group decreased significantly p<0.01). (2) compared with the control group, the TGF-β1, smad2/3 in MH and MN groups were higher p<0.01), and in Tel group was decreased significantly p<0.01). smad7 of carotid arteries media in control group was increased than in other three groups p<0.01), Tel group was increased significantly compared with MH and MN groups p<0.01). (3) AngII of carotid artery was no difference in each group (p>0.05). The AT1 expression in MH and MN groups were higher than in the control group p<0.01), and were much lower in telmisartan group p<0.01). The AT2 expression in MH was increased significantly compared with that of other three groups p<0.01). The AT2 of expression in MN and Tel group were increased compared with that of the control group p<0.01). The aldosterone level in carotid arteries media was increased in MH groups compared with that of the control group p<0.05).

**Conclusions** Long-term high-salt diet can cause the carotid artery remodelling directly or through high blood pressure, it may be related to positive and negative regulation of signal transduction in TGF-β1/smads and the RAAS components in local tissues. Telmisartan can prevent high salt-induced hypertension and remodelling of carotid artery.

**GW23-e2612**  
**EFFECT OF DIFFERENT MAINTENANCE DOSE OF CLOPIDOGREL ON PLATELET FUNCTION IN PATIENTS WITH ACUTE CORONARY SYMPTOM**  
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**Objectives** To assess the efficacy and safety of the high clopidogrel maintenance dose in acute coronary syndromes (ACS) patients undergoing selective percutaneous coronary intervention (PCI).

**Methods** 150 ACS patients were randomly divided into two groups (75 cases in each group). All Patients received a 300-mg loading dose of clopidogrel. Based on taking aspirin, clopidogrel were given (75 cases in each group). All Patients received a 300-mg loading dose of clopidogrel. Based on taking aspirin, clopidogrel were given 75 mg/days or 150 mg/days for 14 days. After 14 days, all patients received clopidogrel 75 mg/days until 1 year after PCI. Respectively, before administration and at the 14 days, peripheral venous blood was collected to determine the ADP-induced platelet aggregation (PA) with turbidimetric method. At same time platelet aggregation inhibition rate (PAI) was calculated. Primary endpoints included death, target organ revascularisation. Secondary endpoints included serious and minor bleeding events.

**Results** Before administration, PA had the non-significance difference (p>0.05) between two groups, and at the 14th day, PA and PAI between two groups were significant different p<0.05). Via 14 days follow up, the incidence of primary endpoint in 150 mg/d group was not obviously lower than that in 75 mg group (1.3% vs 4.0%, p>0.05), and not higher in sub-end events (p>0.05).

**Conclusions** The high maintenance dose clopidogrel (150 mg per day) can strongly inhibit platelet aggregation and decrease the
Methods

Within the WHO examination by means of Spilberger 1994. Levels of personal anxiety were measured at the baseline – fusion injury in either diabetic or non-diabetic rats. These rats, but chronic statin with Ipost fails to protect hearts against reperfusion. Ipost shows a stronger protective effect within the hearts of diabetic rats associated with an inhibition of Akt and eNOS phosphorylation. 59.2% vs 58.5% and 46.7% vs 44.4%, p>0.05), and this might be associated with occupational status, the rate of stroke increased in hard manual worker having HLA, compared engineers with average level of PA (χ²=3.99 df=1 p < 0.05) or with HLA (χ²=4.52 df=1 p < 0.05). With regard to occupational status, the rate of stroke increased in hard manual worker having HLA, compared engineers with average level of PA (χ²=4.518 df=1 p < 0.05) having HLA too.

Conclusions

The combination of acute atorvastatin treatment with Ipost shows a stronger protective effect within the hearts of diabetic rats, but chronic statin with Ipost fails to protect hearts against reperfusion injury in either diabetic or non-diabetic rats. These findings will be important for the design of future clinical investigations.

GW23-e26000

COMPARISON OF CARDIOPROTECTIVE EFFICACY RESULTING FROM A COMBINATION OF ATORVASTATIN AND ISCHAEMIC POSTCONDITIONING IN DIABETIC AND NON-DIABETIC RAT MODELS

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Objectives

This study aimed to investigate whether the combination of acute or chronic atorvastatin treatment with ischaemic postconditioning (Ipost) exerts differential effects within the hearts of diabetic and non-diabetic rats.

Methods

Diabetic and non-diabetic rats were randomly assigned to six groups: (1) nonconditioning; (2) Ipost; (3) acute statin (50 μmol/l atorvastatin during reperfusion) without Ipost; (4) acute statin with Ipost; (5) chronic statin (10 mg/kg atorvastatin per day for 2 weeks) without Ipost; (6) chronic statin with Ipost. Hearts from these rats were subjected to 30 min of global ischaemia, followed by 120 min of reperfusion. Infarct size, hemodynamics and the expression levels of Akt and endothelial nitric-oxide synthase (eNOS) were examined.

Results

Ipost did not limit infarct size and recover contractile dysfunction in the hearts of diabetic rats (p>0.05). Acute atorvastatin with Ipost resulted in infarct size-limiting and contractile dysfunction-recovering effect in both diabetic and non-diabetic hearts (infarct size 37.4% vs 58.5% and 23.6% vs 44.4%, p<0.05), and produced a further activation of Akt and eNOS signalling pathways to enhance these protective effects in the hearts of diabetic rats. Chronic statin treatment with Ipost neither reduced infarct size nor increased myocardial dysfunction recovery in both diabetic and non-diabetic rats (infarct size 59.2% vs 58.5% and 46.7% vs 44.4%, p>0.05), and this might be associated with an inhibition of Akt and eNOS phosphorylation.

Conclusions

The combination of acute atorvastatin treatment with Ipost shows a stronger protective effect within the hearts of diabetic rats, but chronic statin with Ipost fails to protect hearts against reperfusion injury in either diabetic or non-diabetic rats. These findings will be important for the design of future clinical investigations.

GW23-e0001

DEPRESSION AND RISK OF MYOCARDIAL INFARCTION AND STROKE DURING 16 YEARS

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Objectives

To study the influence of depression (D) on relative risk of myocardial infarction (MI) and stroke in women aged of 25–64 years during 16 years of follow up in Novosibirsk.

Methods

Within the WHO ‘MONICA-psychosocial’ (MOPSY) programme random representative sample of women aged 25–64 years who were residents of one district in Novosibirsk, were surveyed in 1994. D was measured at the baseline examination by questionnaire ‘MOPSY’. The registration of MI incidence during 16 years (1995–2010) was performed with using of Myocardial Infarction Registry data. Registration of stroke incidence was made during dynamic following under the cohort of women. Cox proportional regression model was used for an estimation of relative risk (HR) of MI, stroke. χ² was used for assessment of statistical significance between groups. Women having heart diseases or cerebrovascular events at the baseline were not included in the analysis.

Results

High level of anxiety (HLA) in studied cohort revealed in 59.8% of women. During 16 years of study (1995–2010) MI was developed in 2.2% of women, stroke—in 5.1%. Risk of MI development in women with HLA was higher in 4.2 times higher in women with HLA than without it (95.0% CI 1020 to 12 015; p<0.05). MI incidence rates were significantly higher in married women with HLA compared divorced women with lower level of anxiety (χ²=5.66 n=1 p < 0.05). There was a higher rate of stroke increase in women having HLA with higher education, compared those with high school (χ²=4.52 df=1 p < 0.05). With regard to occupational status, the rate of stroke increased in hard manual worker having HLA, compared engineers with average level of PA (χ²=3.99 df=1 p <0.05) or with HLA (χ²=4.52 df=1 p < 0.05).

There was statistical differences in stroke rate between groups of women with heavy manual work having HLA and women with easy manual (χ²=6.35 df=1 p < 0.05) and women with moderate manual work (χ²=4.518 df=1 p <0.05) having HLA too.

Conclusions

There is high prevalence of HLA in Russian female population aged 25–64. During 16 years of follow up women with HLA have significantly higher risk of MI and stroke than without it. MI and stroke development strictly associated with social gradient (married status, level of degree, occupation) in women with HLA.

GW23-e2717


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Objectives

To study the influence of personal anxiety (PA) on relative risk of myocardial infarction (MI) and stroke in women aged of 25–64 years during 16 years of follow up in Novosibirsk.

Methods

Within the WHO ‘MONICA-psychosocial’ (MOPSY) programme random representative sample of women aged 25–64 years who were residents of one district in Novosibirsk, were surveyed in 1994. Levels of personal anxiety were measured at the baseline examination by means of Spilberger’s test. The registration of MI incidence during 16 years (1995–2010) was performed with using of Myocardial Infarction Registry data. Registration of stroke incidence was made during dynamic following under the cohort of women. Cox proportional regression model was used for an estimation of relative risk (HR) of MI, stroke. χ² was used for assessment of statistical significance between groups. Women having heart diseases or cerebrovascular events at the baseline were not included in the analysis.

Results

High level of anxiety (HLA) in studied cohort revealed in 56.7% of women. During 16 years of study (1995–2010) MI was developed in 2.2% of women, stroke—in 5.1%. Rate of D in women with developed MI was 75%, in women with stroke—61%. Risk of MI development in women with HLA was higher in 4.2 times, compared those with low level of anxiety (χ² = 5.66 n=1 p < 0.05). MI incidence rates were significantly higher in married women with HLA compared divorced women with lower level of anxiety (χ² = 5.66 n=1 p < 0.05). There was a higher rate of stroke increase in women having HLA with higher education, compared those with school (χ² = 4.52 df=1 p < 0.05). With regard to occupational status, the rate of stroke increased in hard manual worker having HLA, compared engineers with average level of PA (χ² = 3.99 df=1 p < 0.05) or with HLA (χ² = 4.52 df=1 p < 0.05).

There was statistical differences in stroke rate between groups of women with heavy manual work having HLA and women with easy manual (χ² = 6.35 df=1 p < 0.05) and women with moderate manual work (χ² = 4.518 df=1 p <0.05) having HLA too.

Conclusions

There is high prevalence of HLA in Russian female population aged 25–64. During 16 years of follow up women with HLA have significantly higher risk of MI and stroke than without it. MI and stroke development strictly associated with social gradient (married status, level of degree, occupation) in women with HLA.
more than 4-times higher (HR=4.63; 95% CI 1.03 to 20.89; p<0.05) compared women without D.

**Conclusions** There is high prevalence of D in Russian female population aged 25–64. During 16 years of study women with D have significantly higher risk of MI and stroke than without D.

**GW23-e2692**

**STUDY ON THE SYNDROME BIOLOGICAL BASIS OF ESSENTIAL HYPERTENSION BASED ON LITERATURE MINING**

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**Objectives** To investigate the syndrome biological basis of Essential Hypertension (EH) from the level of genes, proteins and signalling molecules by literature mining software, meanwhile to provide clues for experimental and clinical studies on the biological basis of EH syndrome.

**Methods** GenCLiP gene mining software was applied to search EH-related genes. Then download the up-to-date related literature for each gene from PUBMED. Automatically extracted keywords from the literature and manually curated the keywords, remove unrelated keywords, add diagnostic criteria symptoms of EH syndrome as new keywords based on the Clinical Guiding Principles of Traditional Chinese Medicine Research. Cluster analysis of genes with these keywords was conducted then to investigate current study on the pathogenesis of EH and the syndrome-related genes. What’s more Ali Baba literature mining software was applied for further analysis of the detailed information of the genes, proteins and signalling molecules of each syndrome.

**Results** There are 446 genes related to EH. According to the results of cluster analysis, 14 genes were found closely related to the hyperactivity of liver fire syndrome of EH, GOLPH3, NR4A3, MDD1, MS, CYP2D6, MDD1, MS, CYP2D6, CYP3A4, TRIM21, ACE, ALRH, pLF and TAS2R38. The related signalling molecules and proteins are Phosphatidylinositol 4-kinases, mammalian target of rapamycin, growth-factor, GBF1, NFR3, MYO18A, pDZD2, ARL6I5, TBC1D5, SCAMPs, C1orf122, calnexin, Sec2, SUB1, BFRV, TR3, NGFI-B, Nor-1, oestrogen-receptor, N-acetyltransferase2, CYP2C19, APOE, cytochrome P450, vascular endothelial growth factor, total testosterones, growth hormone, TSHB, nitric oxide synthase, pPARA, p-glycoprotein inhibitor, Testosterone, AMG, progesterone receptor membrane component 2, pARE, ASB, SSA, SsbB, p53, BRC2A2, NF-κ B, toll interacting protein, Interferon Regulatory Factor 1, Fas-associated death domain, TLR4, TRIB2, CENP-B, angiotsentin-converting enzyme inhibitors, Angiotsentin-Converting Enzyme 2 AT1, renin, Renalase, Angiotsentin, Tph1, interleukin-2. Two genes, GOLPH5 and PLE were found related to the syndrome of excessive accumulation of phlegm-dampness. The related signalling molecules and proteins are Phosphatidylinositol 4-kinases, mammalian target of rapamycin, growth-factor, GBF1, NFR3, MYO18A, pDZD2, ARL6I5, TBC1D5, SCAMPs, C1orf122, calnexin, Sec2, SUB1, BFRV. Nine genes were found related to the syndrome of Yin-yang concurrent deficiency, GOLPH5, CRP, NFPB, COPD, IGHE, ALB, ALRH, pLF and ACE. The related signalling molecules and proteins are tumour necrosis factor-α, metalloproteinase-9, cystatin C, B-type natriuretic peptide, adiponectin, IL-6, CR3, ADR2, leptin, TnnC1, chloride channel, ATP2B1, Myl1, MTHFR, NFPA, prolactin, IGHEP1, IGHC3, IGHA1, IGHC2, EcoRI, IGHD, CYP2B6, cytochrome P450, SOD, Ferroportin1.

**Conclusions** Study on the biological basis of syndrome has always been the hot and difficult spots in TCM research. This study initially conducted research on the biological basis of EH syndrome from the level of gene, protein and signalling molecule by applying GenCLiP gene-mining software and Ali Baba literature mining software. The results also provide clues for experimental and clinical studies on the biological basis of EH syndrome.

**GW23-e2703**

**ASSESSING THE ROLE OF HOMOCYSTEIN IN NUMBER AND SEVERITY OF CORONARY ARtery INVOLVEMENT, IN PATIENTS WITH AND WITHOUT MAJOR CORONARY RISK FACTORS THAT UNDERWENT ELECTIVE CORONARY ANgiOGRAPHY**

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**Objectives** Coronary artery disease is a major problem for the health and is the most common cause of Mortality and morbidity in the word. Preventive measures such as risk factor modification Play central Role in decreasing cardiovascular events. According to the studies one third of patients suffering from coronary artery disease have no identifiable risk factor. Therefore Novel risk factor recognition such as Lp (a), homocystein, fibrinogen and properly modifying these factors highlighted, especially in patient with low conventional cardiac risk factors. Homocystein is a sulphohydlin amino acid derived from dietary methionin metabolism, and its level correlate with higher Cardivascular events, the main goal of our Study is to evaluate the role of homocystein as a risk factor of CAD and also assess the relation between plasma level of homocystein and the number and severity of coronary arteries involvement by angiographic indices.

**Methods** This is a Cross-Sectional study that evaluated 270 patients suffering from CAD that underwent invasive coronary angiography by expert cardiologist if clinically indicated. Personal Data and variables gathered by questionnaire including: Age, Sex, History of hypertension, Dyslipidemia, Smoking, prior MI, diabetes. Family history of premature CV event and past medical history of Kidney, Liver or thyroid disorders. Then venous blood sample was taken for homocystein level. The relation between homocystein and cardiac Risk factors separately evaluated followed by assessment of extension and severity of underlying CAD in relation to Homocystein Level.

**Results** This is a Cross-Sectional study that evaluated 270 patients suffering from CAD that underwent invasive coronary angiography by expert cardiologist if clinically indicated. Personal Data and variables gathered by questionnaire including: Age, Sex, History of hypertension, Dyslipidemia, Smoking, prior MI, diabetes. Family history of premature CV event and past medical history of Kidney, Liver or thyroid disorders. Then venous blood sample was taken for homocystein level. The relation between homocystein and cardiac Risk factors separately evaluated followed by assessment of extension and severity of underlying CAD in relation to Homocystein Level.

**Conclusions** Among patients underwent this Study 62.9% were Hypertensive, 24.8% Diabetic, 5.6% with Positive Family history, 49.6% suffer from Hyperlipidaemia, 69% had previous History of MI or complains of Typical angina pectoris. Homocystein Level was High in 45.2% and Low in 1.5% of patients. Based on Coronary Angiography Report: the prevalence of Single Vessel disease (1VD) was 17.7%, two Vessel Disease (2VD) 33.3% and three Vessel Disease (3VD) 47.7%.
Conclusions

Probucol can increases stability of vulnerable atrial fibrillation in alloxan-induced diabetic rabbits.

E92

Methods

In this prospective observational study, seventy patients presenting with acute coronary syndrome (ACS) including ST and non-ST segment elevation acute myocardial infarction and unstable angina were enrolled. Sociodemographic and clinical characteristics and in hospital outcomes were compared for patients according to Glomerular filtration rates (GFR) that was estimated by the abbreviated Modification of Diet in Renal disease study Group equation (MDRD) where patients with GFR≥60 ml/min/1.73 m² were considered to have normal to mild renal dysfunction and with <60 ml/min with moderate to severe renal dysfunction.

Results

Patients with moderate to severe renal dysfunction were elderly female and associated with more comorbidities and adverse outcomes if compared with patients who had normal to mild renal dysfunction. The patients were divided into two groups: STEMI and NSTEMI/UA; there was statistical differences where in the former, there was no significant association with occurrence of adverse outcomes and moderate to severe renal dysfunction but preserve significant association with occurrence of adverse outcomes.

Conclusions

Moderate to severe renal impairment is a predictor of in-hospital morbidity and mortality in ACS.

GW23-e2714

THE IMPACT OF RENAL DYSFUNCTION ON IN HOSPITAL CARDIOVASCULAR MORBIDITY AND MORTALITY IN ACUTE CORONARY SYNDROME

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Objectives

Outcome is poor in patients with acute myocardial infarction (MI) who have renal dysfunction in long term follow up. Less is known about the outcome of acute MI in short term.

Aim of the Study

To evaluate the outcome of acute coronary syndrome (ACS) in varying degrees of renal dysfunction.

Methods

Patients and Methods

In this prospective observational study, seventy patients presenting with acute coronary syndrome (ACS) including ST and non-ST segment elevation acute myocardial infarction and unstable angina were enrolled. Sociodemographic and clinical characteristics and in hospital outcomes were compared for patients according to Glomerular filtration rates (GFR) that was estimated by the abbreviated Modification of Diet in Renal disease study Group equation (MDRD) where patients with GFR≥60 ml/min/1.73 m² were considered to have normal to mild renal dysfunction and with <60 ml/min with moderate to severe renal dysfunction.

Results

The probucol-treated diabetic rabbits exhibited significant alleviation of oxidative stress displayed as decreased plasma MDA and TNF-α. We also performed histology examination to assess atrial fibrosis and atrial myocytes areas.

Results

The probucol-treated diabetic rabbits exhibited significant alleviation of oxidative stress displayed as decreased plasma MDA and TNF-α p<0.05), probucol administration increases stability of vulnerable atrial fibrillation in diabetic rabbits p<0.05).

Conclusions

Probucol can increases stability of vulnerable atrial fibrillation in alloxan-induced diabetic rabbits.

GW23-e1131

EFFECT OF CONTINUOUS OPENING AIRWAY IN EMERGENCE CARDIOPULMONARY RESUSCITATION

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Objectives

To explore effect of continuous opening airway in emergency cardiopulmonary resuscitation which can hopefully lead to the development of more effective ways to open airway in short period of time.

Methods

49 consecutive cases of patients with acute cardiac-pulmonary arrest that require emergency cardiopulmonary resuscitation at the EICU and emergency observation room of our hospital during 11 May 2010 and 2 September 2012 all cases were randomly divided into continuous opening airway implementation group and conventional group. The studies was performed in accordance with guidelines as prescribed in the International cardiopulmonary resuscitation 2010 guidelines, in applying cardiopulmonary resuscitation, monitoring and recording recovery process and the physical signs, as well as observing the general progress and use of respirator.

Results

Evidently more patients in the implementation group had iris shrinking to normal during the resuscitation process than those in the conventional group p<0.05). This group also requires less time in returning to normal breathing than the conventional group. Additionally, the same group required more frequent use of SIMG+PSV or PEEP p<0.05).

Conclusions

Applying continuous opening airway in an effective and well-organised manner positively contribute to cardiopulmonary resuscitation and prognosis of patients.

GW23-e1628

THE VALUE OF LEAD AVR IN IDENTIFYING THE INFARCTED-RELATED ARTERY AND PROGNOSIS IN PATIENTS WITH ACUTE ANTERIOR MYOCARDIAL INFARCTION

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Objectives

TO investigate the value of lead aVR in identifying the infarcted-related artery and prognosis in patients with acute anterior myocardial infarction.

Methods

We analysed electrocardiogram and coronary angiography in patients with acute anterior myocardial infarction.

Results

1. There was significant difference in the patients whose infarct-related artery was left main coronary artery between in the elevation group (9 cases, 27.3%) and no elevation group (2 cases, 2.8%) p<0.01); The patients whose infarct-related artery was proximal left anterior descending coronary artery in elevation group, 22 cases (66.7%) were significantly more than that of no elevation group, 26 cases (36.6%) p<0.01). The cases with multi-vessel lesions in elevation group (15 cases, 45.4%) were significantly more than in no elevation group (16 cases, 23.5%) p<0.01).

2. The cases with heart incident in elevation group, 11 cases (33.3%) were significantly more than in no elevation group, 9 cases (9.9%) p<0.01); The left ventricular ejection fraction (LVEF) was significantly lower in elevation group than in no elevation group p<0.05);
4. The peak creatine kinase MB fractions was significantly higher in elevation group than that in no elevation group (p<0.01).

Conclusions: ST segment elevation of aVR lead is useful for predicting infarct-related artery and prognosis in patients with acute anterior myocardial infarction.

GW23-e1638  SIMVASTATIN PREVENT RABBIT ARTERIALATHEROSCLEROSIS DEVELOPMENT THROUGH INTERFERING NUCLEAR FACTOR-κB ACTIVATION
doi:10.1136/heartjnl-2012-302920a.245

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Objectives: To explore the effects of simvastatin on NF-κB activation in cholesterol diet rabbit artery and the underlying mechanisms of the beneficial effects of simvastatin on atherosclerosis (AS).

Methods: Twenty-four male rabbits were randomly divided into three groups: normal diet groups, cholesterol diet groups and the simvastatin groups which received both cholesterol diet and simvastatin 5 mg/kg/day intragastrically, After 16 weeks rabbits were executed and the aortas were harvested for the pathologic and morphologic observations. Western blot was used to determine cytoplasmic p-I-κB, I-κBα, protein expression and cytoplasmic and nuclear NF-κB p65 protein expression of rabbit aortas.

Results: Compared with normal diet groups, cholesterol diet groups demonstrated remarkably atherosclerosis in the arteries. And the expression of cytoplasmic p-I-κBα and nuclear NF-κB p65 expression was obviously increased, but I-κBα was markedly decreased in cholesterol diet groups (n=6; p<0.01). However, simvastatin could dramatically inhibit the formation of atherosclerotic plaques, suppress p-I-κBα protein expression, increase I-κBα protein expression, and promote NF-κB p65 translocation from cytoplasm to the nucleus (n=6; p<0.01).

Conclusions: NF-κB activation might be involved in the process of atherosclerosis in high cholesterol diet rabbits. Simvastatin could ameliorate atherosclerosis (AS) through interfering NF-κB activation and translocation.

GW23-e2215  ACTIVATION OF NF-E2-RELATED FACTOR 2 BY X-BOX BINDING PROTEIN 1 PROTECTS ENDOTHELIAL CELLS FROM TUMOUR NECROSIS FACTOR-α INDUCED OXIDATIVE STRESS
doi:10.1136/heartjnl-2012-302920a.246

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Objectives: Oxidative stress plays a critical role in endothelial cell (EC) dysfunction in atherosclerosis. NF-E2-related factor 2 (Nrf2) is the transcription factor which has antioxidant capacity. X-box binding protein 1 (XBP1) plays a great part in endoplasmic reticulum (ER) stress and ER stress response. This study is to test the hypothesis that spliced XBP1 has protective effect on tumour necrosis factor α (TNF-α) induced oxidative stress, and the potential role of the activation of Nrf2 in cultured human umbilical vein endothelial cells (HUVECs).

Methods: Spliced XBP1 was overexpressed in HUVECs by infection of cells with adenovirus encoding mouse spliced XBP1 (Ad-XBP1s). Adenovirus encoding green fluorescent protein (Ad-GFP) was used as control. HUVECs were infected with Ad-XBP1 or Ad-GFP for 48 h, then stimulated in the presence or absence of TNF-α (10 ng/ml) for 24 h. Intracellular superoxide anions generated by HUVECs were measured by Dihydroethidium (DHE) fluorescence assay. Expression of 3-Nitrotyrosine (3-NT) was measured by western blot analysis. XBP1 knockdown was performed by Small RNA interference (siRNA). The knockdown efficiency was monitored by determining the protein level of XBP1 using western blot analysis. HUVECs were transfected with scramble siRNA or XBP1 siRNA using Lipofectamine 2000 for 6 h, then treated with Nrf2 inducer tert-butylhydroquinone (tBHQ) (20 μM) for 12 h. The expressions of Nrf2 were determined by western blot analysis.

Results: Overexpression of XBP-1 inhibited TNF-α induced ROS generation and 3-NT expression. Moreover, overexpression of XBP-1 enhanced tBHQ induced Nrf2 expression. In addition, downregulation of XBP1 by transfection with XBP1 siRNA suppressed the tBHQ induced Nrf2 expression in cultured HUVECs.

Conclusions: XBP1 suppresses TNF-α induced ROS generation possibly by activating Nrf2 in cultured HUVECs.
**Methods** We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2012, Issue 3), MEDLINE (1966 to March 2012), EMBASE (1966 to March 2012), CINAHL (1982 to November 2010), the Chinese Biomedicine Database (1978–2012) and China National Knowledge Infrastructure (CNKI) (1994 to March 2012). Only randomised controlled trials (RCTs) and quasi-RCTs aiming to the relationship between chronic Periodontitis and cardiovascular diseases will be eligible and included. Two authors independently assessed articles for inclusion.

**Results** We included eight studies involving 1302 patients with CVD and 1217 normal participants. All studies mentioned random allocation but provided no description about which methods were used in the published paper. Meta analysis result showed that the chronic periodontitis and coronary heart disease are related closely (OR=1.31 (95% CI 1.13 to 1.62)).

**Conclusions** Based on the existing evidence in this review, the chronic periodontitis and coronary heart disease are related closely. However, due to the lack of high quality clinical trials, the relationship between the chronic periodontitis and coronary heart disease is controversial and questionable.

**GW23-e2148**  
ACTIVATION OF RETINOID X RECEPTOR PROTECTS AGAINST HYPOXIA-REOXYGENATION INDUCED APOPTOSIS AND LOSS OF MITOCHONDRIAL MEMBRANE POTENTIAL IN H9C2 RAT VENTRICULAR CELLS

doi:10.1136/heartjnl-2012-302920a.249

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**Objectives** Retinoid X receptor (RXR) plays a central role in the regulation of intracellular receptor signalling. To determine the effect of activating RXR on rat cardiomyocytes apoptosis and the loss of mitochondrial membrane potential in hypoxia-reoxygenation induced oxidative injury.

**Methods** The model of hypoxia/reoxygenation (H/R) injury was established through hypoxia for 6 h and reoxygenation for 4 h in cardiomyocytes of H9c2. We measured the survival rate by Trypan blue exclusion, apoptosis rate of cardiomyocytes by FACs analysis, and mitochondrial membrane potential by JC-1 fluorescent probe. All measurement data were expressed as mean±SD of mean, and statistically analysed using one-way ANOVA analysis and Dunnett test. Differences were considered significant when P <0.05.

**Results** We showed that the RXR agonist 9-cis retinoid acid (9-c RA) protected cells from H/R-induced cell injury and loss of mitochondrial membrane potential, and the protective effect of 9-c RA against H/R was abolished when pretreated with HX531 (RXR pan-antagonist).

**Conclusions** Activating RXR inhibited apoptosis and prevented the loss of mitochondrial membrane potential induced by H/R injury in rat cardiomyocytes H9c2, which suggests that stabilisation of mitochondrial membrane potential may be involved in the protection of activating RXR against oxidative stress in H9c2.

**GW23-e2433**  
EFFECTS OF ALDOSTERONE ON L-TYPE CALCIUM CHANNEL AND ELECTROPHYSIOLOGICAL FEATURES ON CARDIOCYTES

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**Objectives** to investigate the effect of aldosterone on L-type calcium channel and electrophysiological features on cardiocytes.

**Methods** Single ventricular myocytes were isolated by enzymatic dissociation method. Isolated adult rat ventricular myocytes exposed for 48 h to aldosterone 100 nmol/l, APD and ICa,L were recorded by using whole cell patch clamp technique.

**Results** we observed an increase in the APD 50, APD90 and ICa,L in Ald group, I-V curve of ICa,L.

**Conclusions** Aldosterone on cardiocytes increase in the APD and ICa,L which may contributes to cardiac arrhythmia.

**GW23-e2573**  
PREVALENCE OF HYPERTENSION AND ITS DETERMINANTS AMONG ADULT RESIDENTS: A CROSS-SECTIONAL STUDY FROM SHANDONG PROVINCE

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**Objectives** To estimate the prevalence of hypertension and explore its determinants among adult residents in Shandong Province, and provide scientific evidence for the establishment of hypertensive prevention and control in whole province.
Methods A representative sample of 15350 subjects aged between 18 and 69 were selected with multiple stratified and clustered sampling to acquire related information by questionnaire survey and physical measurement. The prevalence of hypertension was estimated and its main determinants were analysed by SURVEYLOGISTIC regression.

Results The prevalence of hypertension was 23.44% among adult residents in Shandong Province, and the average SBP and DBP were 121.1 and 78.8 mm Hg respectively. The prevalence in male with 25.71% was higher than in female with 21.13%, and the average SBP and DBP in male had a 6.3 and 3.1 mm Hg than in female. The prevalence in rural area with 24.57% was higher than in urban area with 20.77%, and the average SBP and DBP in rural area had a 3.5 and 1.4 mm Hg than in urban area. The prevalence of hypertension and average blood pressure all remarkably increased with age rising especially among residents aged less than 60. The prevalence of hypertension and average blood pressure in old women were higher than old man, while there were no significant difference between them. The analysis of influencing factors showed that the risk factors were age, male, BMI (overweight and obesity), waist circumference, Diabetes Mellitus, abnormally TC, abnormally TG and often drinking, and the protective factors were female and occasionally drinking. By the way, the association between BMI and hypertension was strongest among all influencing factors. The hazard of hypertension occurrence in overweight persons was about two times than in normal weight persons with OR of 1.728 (95% CI 1.451 to 2.059), while the hazard in obesity was nearly four times than normal weight persons with OR of 3.988 (95% CI 3.073 to 5.176).

Conclusions Hypertension is a multi-factors disease, and multiple factors could influence the hypertension occurrence. As a result, the comprehensive strategy and measurements of hypertension prevention and control should be established according to epidemiology of hypertension in different people and focus on early intervention to effectively prevent and control the hypertension occurrence.

GW23-e2580 CORRELATIVE STUDY BETWEEN THE LEVEL OF APELIN IN SERUM AND GENSIINI SCORE IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Objectives Serum Ghrelin was measured in patients of acute coronary syndrome (ACS). Investigate whether serum levels of Ghrelin are associated with the Gensini score on patients with ACS.

Methods 75 cases of patients with ACS were divided into 28 cases of unstable angina (UA), 11 cases of non-ST elevation myocardial infarction (STEMI) and 36 cases of ST elevation myocardial infarction (STEMI), 13 cases of normal angiography as the control group. There was significant statistically differences among the four groups (p=0.001). Correlation test showed that level of OPG was negatively related to Gensini score (r=-0.532, p<0.05).

Conclusions The level of Apelin might involve in the pathogenesis of acute coronary syndrome, moreover, the activity of apelin was negatively correlated with the severity of the coronary artery lesions.

GW23-e2639 ATORVASTATIN IN PULMONARY HYPERTENSION (APATH) STUDY

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Objectives Statins have been shown to both prevent and attenuate pulmonary hypertension in animal models. This study investigates the potential therapeutic benefits of atorvastatin as an affordable treatment for pulmonary hypertension patients. Two hundred and twenty patients with pulmonary arterial hypertension (PAH) or chronic thromboembolic pulmonary hypertension (CTEPH) were randomised, double-blind, to receive atorvastatin 10 mg daily or matching placebo in addition to supportive care. At 6 months, 6-min walk distance decreased by 16.6 m in the atorvastatin group and 14.1 m in the placebo group. The mean placebo-corrected treatment effect was −2.5 m (95% CI −38 to 35; p=1.0), based on intention to treat. A small non-significant increase in pulmonary vascular resistance and fall in cardiac output was seen in both treatment groups. There was no significant difference in the proportion of patients who improved, remained stable or showed deterioration in WHO functional class between atorvastatin and placebo treatments. Nine patients died in the atorvastatin group and 11 in the placebo group. Serum cholesterol levels fell significantly on atorvastatin treatment. Discontinuation rates were 25.2% and 26.9% on atorvastatin and placebo respectively. Atorvastatin 10 mg daily has no beneficial effect on the natural history of PAH or CTEPH over 6 months.

Methods

Conclusions

GW23-e1561 PHENOTYPE DIFFERENCE BETWEEN GENOTYPE OF PLAKOPHILIN-2 MUTATION AND DESMOGLEIN-2 MUTATION IN SYMPTOMATIC CHINESE PATIENTS WITH ARRHYTHMOGENIC RIGHT VENTRICULAR DYSPLASIA/CARDIOMYOPATHY-A REPORT FROM CHINESE ARVD REGISTRY

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Objectives Arrhythmogenic Right Ventricular Dysplasia/cardio-myopathy (ARVD/C) is an inherited heart muscle disease associated mainly with the mutations of desmosome. Plakophilin-2 (PKP2) and desmoglein-2 (DSG-2) are reported as the most two common ARVD-causing genes in western countries. In this study we aim to determine the prevalence of PKP2 and DSG2 mutations in Chinese ARVD/C patients, and their phenotype characteristics.

Methods Genotype and phenotype were investigated in a cohort of 23 symptomatic unrelated Han Chinese with a clinical diagnosis of ARVD. PKP2 and DSG2 genes were identified using PCR and direct sequencing. Clinical evaluation included family and personal medical histories, 12-lead electrocardiography, transthoracic echocardiography, signal average electrocardiography, 24-h ambulatory electrocardiography, and MRI in some patients.

Results Five novel heterozygous mutations (R158K, Q211X, L419S, A799D and N825fsX930) of PKP2 were identified in 50% (7/23) of ARVD patients; three mutations (R46G, D494A and F531C) in
DSG2 were identified 13% (3/23) of the patients. Among the positive patients initial symptoms occurred at 30±10 years. All of them documented VT. Symptoms of the patients with PKP2 mutation were severe than that of patients with DSG2 mutation, most of the patients with PKP2 mutation had syncope, but none of the patients with DSG2, they only had palpitation. most of the patients with PKP2 mutation (6/7) showed epsilon waves in ECGs but only one in patients with DSG2; 6 patients with PKP2 mutation showed inverted T wave in V1 to V3, but only one in patients with DSG2 mutation.

Conclusions Five novel heterozygous mutations (R158K, Q211X, L419S, A793D and N852fsX930) of PKP2 and three heterozygous mutations (R46G, D494A and F531C) of DSG2 were identified. The study has revealed a greater frequency of occurrence of PKP2 mutations when compared to DSG2 mutations. There are some difference between patients with PKP2 mutation and that with DSG2 mutation including clinical symptom and ECGs. It seems that phenotype of PKP2 mutation were severe than that of DSG2 mutation in this cohort.

GW23-e1798 MYOCARDIAL INFARCT SIZE AND INFARCT TIME PLAY AN IMPORTANT ROLE IN THE MIGRATION OF SCA-1+ CARDIAC STEM CELL

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Objectives After myocardial infarction, the limited ability of regeneration of myocardial tissue can barely repair the extensive necrosis of myocardial cells. For further revealed the mechanism of myocardial restoration, this study detected the migration and the quantity changes of Sca-1+ cardiac stem cell after myocardical infarction.

Methods Wister Rats were anesthetised and left anterior descending (LAD) coronary artery was ligated for 1 week, 2 weeks and 4 weeks. Then randomly divided into Control group (CG) and Infarction 1 week group (IG1), Infarction 2 weeks group (IG2) and Infarction 4 weeks group (IG4). Followed, the rats were executed, and the myocardial tissue of rats in each group was frozen and paraffin-embedded. After that, HE staining was to assess tissue damage, Collagen staining (Masson staining) was to assess infarct size, the migration and quantity changes of Sca-1+ cardiac stem cell were assessed by Immunofluorescence and immunohistochemistry.

Results Immunofluorescence and immunohistochemistry showed that (1) Sca-1+ cardiac stem cells in the infarcted zone express greater number than the infarct border zone; (2) After myocardical infarction, cardiac stem cell has migrated to the infarct zone and perivascular; (3) Migration of cardiac stem cells were proportional to the infarct size; (4) Sca-1+ cardiac stem cells at IG4 expressed larger number than IG1 or IG2.

Conclusions After myocardical infarction, cardiac stem cell has migrated to the infarct zone and perivascular, which were decided by the proportional of infarct size and infarct time.

GW23-e1258 THE EFFECT OF ROCK1 AND ROCK2 SILENCING BY shRNA ON APOPTOSIS INDUCED BY HYPOXIA IN RAT CARDIOMYOCYTE

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Objectives It is well known that the apoptosis of cardiomyocyte involves the development of some cardiovascular diseases, such as heart failure, coronary heart disease and so on. Down-regulation of ROCK1 (Rho-associated coiled-coil protein kinase-1) and ROCK2 could inhibit apoptosis of a variety of cells. Therefore, shRNAs targeting ROCK1 and ROCK2 were transfected into rat cardiomyocytes to inhibit the expression of ROCK1 and ROCK2. The effect of ROCK1 and ROCK2 on apoptosis induced by hypoxia was studied in rat cardiomyocyte.

Methods 1. Rat cardiomyocytes were cultured primarily and identified by using antibody targeting α-actin of striated muscle.
2. Three recombinant plasmids of ROCK1-shRNA and ROCK2-shRNA were constructed respectively and identified.
3. ROCK1-shRNA and ROCK2-shRNA were transfected transiently into cells by liposome. After 48 h, the protein of ROCK1 and ROCK2 was isolated and detected through Western
Blots. The shRNAs with the best silencing efficiency were selected from these shRNAs.

4. ROCK1-shRNA and ROCK2-shRNA with the best silencing efficiency were transfected into cardiomyocytes. After 48 h, these cells were subjected to hypoxia for 6 h. The experiments were divided into five groups: Blank Control Group, Hypoxia Group, Hypoxia + Negative Control shRNA Group, Hypoxia + ROCK1-shRNA Group, Hypoxia + ROCK2-shRNA Group. The expression of green fluorescent protein was observed through fluorescence microscopy.

5. Followed by treatment with transfection and hypoxia, Western Blotting was used to determine the expression of Caspase3, p-PI3K and PI3K, cardiomyocyte beat frequency and rhythm was assessed using microscopy, the content of lactate dehydrogenase (LDH) in cell culture fluid was detected by automatic biochemical analyser, cell survival rate was determined with MTS, cell apoptosis rate was assessed by using flow cytometry.

Results
1. It was confirmed that rat cardiomyocytes were cultured successfully.
2. Western blotting results showed that the transfection of ROCK1-shRNA and ROCK2-shRNA inhibited the expression of ROCK1 and ROCK2 effectively, ROCK1-shRNA1 and ROCK2-shRNA2 have the best silencing efficiency.
3. By fluorescence microscopy, green fluorescences were observed in the cells transfected with shRNA, indicating that these recombinant plasmids were transfected successfully.
4. Hypoxia decreased the beat frequency and extent of cardiomyocyte, made rhythm disorder, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.
5. Automatic biochemical analyser showed that hypoxia increased the content of LDH, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.
6. MTS results showed that hypoxia decreased cell survival rate, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.
7. Flow cytometry results showed that hypoxia increased cell apoptosis rate, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.
8. Western blotting results showed that hypoxia increased the expression of Caspase3, and decreased the expression of p-PI3K, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.

Conclusions
1. The expression of ROCK1 and ROCK2 in rat cardiomyocyte can be inhibited effectively by the transfection of ROCK1-shRNA and ROCK2-shRNA.
2. The down-regulation of the expression of ROCK1 and ROCK2 can reduce the effects caused by hypoxia, that the proliferation of rat cardiomyocytes was attenuated and the apoptosis was enhanced.
3. It is through ROCK1 and ROCK2 that the expression of Caspase3 and p-PI3K is influenced by hypoxia.
4. A new possible method is provided for treatment of some cardiovascular diseases, such as heart failure and coronary heart disease.

Objectives To explore the effect of tirofiban on cardiac function after myocardial ischaemia reperfusion in dogs.

Methods Thirty hybrid dogs were randomised into three groups, sham operation group, model control group and tirofiban treatment group (10 dogs in each group). Coronary arteries of hybrid dogs were ligated to establish the models of myocardial ischaemia reperfusion. While the dogs in sham operation group didn’t undergo occlusion of coronary artery. One-month after operation, hemodynamic parameters and cardiac function in all survival dogs were evaluated. Then the hybrid dogs were executed and the hearts were obtained for cardiac pathological analysis: to analyse quantitatively the thickness of left ventricular free wall (LVWT) in infarcted region, septum (SFT) and ratio of SFT/LVWT, myocardial across area in septum (MAAS) and collagen volume fraction (CVF) in noninfarcted and infarcted region.

Results The hemodynamics analysis showed SBP, DBP, LVSP, ±dp/dt max in model control group and tirofiban treatment group were significantly lower than those of sham operation group p<0.05), however, LVEDP was obviously higher than that of sham operation group p<0.05). The ±dp/dt max in tirofiban treatment group was significantly higher than that of model control group p<0.05), but LVEDP was lower than that of model control group p<0.05). After 1 month ischaemia reperfusion, LVWT in model control group and tirofiban treatment group was significantly lower than that of sham operation group p<0.05), however, SFT/LVWT, MAAS, CVF in infarcted region were obviously higher than those of sham operation group p<0.05). The LVWT in tirofiban treatment was obviously higher than that of model control group p<0.05), while SFT/LVMT, MAAS, CVF were obviously lower than those of model control group p<0.05).

Conclusions Tirofiban can improve cardiac function after myocardial ischaemia reperfusion in dogs.

THE EFFECT OF TIROFIBAN ON CARDIAC FUNCTION AFTER MYOCARDIAL ISCHAEMIA REPERRUSION IN DOGS

GW23-e1263

THE EFFECT OF TIROFIBAN ON CARDIAC FUNCTION AFTER MYOCARDIAL ISCHAEMIA REPERRUSION IN DOGS

GW23-e1391

THE INFLUENCE OF ACH TO ISOLATED GUINEA PIG CARDIAC ATRIUM MYOCYTES IKACH


Objectives Atrial frillation (AF) is one of the common clinical arrhythmia and its pathogenesis is extremely complex. In recent years, scholars have observed that stimulating vagus nerve can induce AF. Acethylchololhe (Ach) is transmitter of vagus nerve and it gives its biological role through combination with M receptor. Acetylcholine sensitive potassium current (IKach) is the current which induces AF. However, it is not clear about the relation between Ach and IKach. So in this paper the change of isolated guinea pig cardiac atrium myocytes under the intervention of Ach is observed and it aims to further discuss the relation between vagus nerve and AF and provide a new thinking for the research of AF pathogenesis and better treatment.

Methods Take a healthy adult guinea pig. Beat the head to make it dizzy and then take out of the heart quickly. Under the temperature of 37°C and condition of oxygen, do Langendorff perfusion. Infuse by tyrode with calcium for 0.5 min to wash the remaining blood in the heart. Infuse by tyrode without calcium containing collagenase to digest atrium muscle. Put it into stock solution and shake it until the content of LDH, while the transfection of ROCK1-shRNA and ROCK2-shRNA reduced the effects caused by hypoxia.
for 10 min. Take supernatant liquor for centrifugation about 1 min and then throw away the supernatant liquor. Add stock solution and then put it into the fridge under the temperature of 4°C to preserve for standby application. Divide prepared cardiac atrium myocytes into 4 groups including control group, 0.01 μmol/l Ach, 0.1 μmol/l Ach and 1 μmol/l Ach. Use whole-cell patch clamp technique to record guinea pig cardiac atrium myocytes IKåch. During the operation, add CaCl2 (200 μmol/l) into extracellular fluid in order to block calcium current and chloride current of calcium activation. Use Glyburide (10 μmol/l) and Mg-ATP (5 mmol/l) in electrode inside fluid to block ATP sensitive potassium channel. Use chomanol 293B (20 μmol/l) and E-4031 (5 μmol/l) to respectively block Iks and Ikr channels; 4-AP excludes intervention of Ito and TTX excludes intervention of INa+.

Results
1. IKåch of control group is (9.3 ± 0.70) pA/pF; in 0.01 μmol/l Ach group IKåch is made to increase to (10.05 ± 0.72) pA/pF. But there is no substantial difference between the two groups (p>0.05); In 0.1 μmol/l Ach group IKåch is made to increase to (11.69 ± 2.13) pA/pF. Compared with control group there is relatively remarkable difference (p<0.05); in 1 μmol/l group IKåch is made to increase to (15.36 ± 2.91) pA/pF and compared with control group there is very remarkable difference (p<0.01). It is concentration dependent.

2. Respectively measure IKåch value corresponding to Ach under the voltage of +40 mV (–120 mV). After function of Ach, the value of IKåch increases. The computer draws its I–V curve and it can be seen that I–V curve moves up and the form of curve is not changed, that is to say, it has the function of promotion to IKåch and within a certain concentration range, the promotion to IKåch increases with the increase of concentration.

Conclusions
Ach can increase amplitude of IKåch of cardiac atrium myocytes and promote IKåch of cardiac atrium myocytes to shorten action potential time interval and effective refractory period. Then foldback excitation is caused and finally it leads to the production of AF. So IKåch may be effect target of vagus nerve inducing AF.

GW23-e0622 THE RELATIONSHIP BETWEEN SERUM 25-HYDROXYITAMIN D AND ACUTE CORONARY SYNDROME

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Objectives
To study the relationship between serum 25-hydroxyitamin D and acute coronary syndrome.

Methods
71 patients whom conform to standard were chosen from Apr 2011 to June 2011 in the second hospital of Tianjin Medical University: 18 cases were acute myocardial infarction, 16 cases were unstable angina, 25 cases were stable angina, 14 cases were control group. The level of 25-hydroxy Vitamin, mmp-9, Tlr-4 in serum were measured by ELISA in every group. The correlation between serum 25-hydroxyitamin D and mmp-9, TLR-4 were analysed.

Results
The serum level of 25-hydroxyitamin D was significantly lower in ACS group than in SAP group, control group p<0.01. No significantly different was found between SAP group and control group. A negative correlation was found between the level of 25-hydroxyitamin D and mmp-9, Tlr-4.

Conclusions
Serum 25-hydroxyitamin D play an important role in the development of ACS and have native relationship with mmp-9, Tlr-4.
Methods curcumin and HSP70 expression.

Objectives Investigate the protective effects and antiapoptotic of curcumin on hypoxia/reoxygenation cardiomyocyte cells. Investigate the relationship between anti-apoptotic mechanisms of curcumin and HSP70 expression.

Methods Primary culture the myocardial cells of 1–3 days SD neonatal rats. Integration and synchronisation heat well primary culture cells used in experiment. Measured by MTT assay curcumin side effects on myocardial cells, then calculate the IC50. Find the best intervention concentration, which has no obvious side effects on myocardial cells. Select the high, medium and low concentration used in the experiment. Counting cells and inoculated plate, grouping and curcumin intervention. Then application of a continuous spectrum multifunctional microplate reader detected in each group at each time point supernatant lactate dehydrogenase (LDH) activity and malondialdehyde (MDA) content. Use Hoechst 33342 and propidium iodide (PI) double staining the cells, then observation the cells apoptosis and necrosis by fluorescence microscope. Immunohistochemical method to observe the expression of HSP70 in myocardial cells in each group.

Results Contrast with the treatment group and the normal control, MDA content was lowest; After hypoxia, showing the highest MDA content in the I/R group. MDA content in high, medium and low concentrations of curcumin groups were increased, and with curcumin reduce the concentration of activity increased significantly. Compared with the normal control group, the difference was statistically significant, Normal control group with time, the MDA content were not significantly changed. Compared with I/R group cells, apoptosis of the groups cell with curcumin were less. Immunohistochemistry to detect the change of HSP70 in the cells each group. Hypoxia/reoxygenation 0 h, there were almost no expression of HSP70. HSP70 expression increased, but given the curcumin group express increased than the I/R group. And amount of HSP70 expression is proportional to the concentration of curcumin amount. There were almost no expression of HSP70 in normal control group cells, and no significant change over time. Myocardial cells after hypoxia/reoxygenation injury with time, HSP70 expression was increased. Compared with I/R group cells, HSP70 expression of the groups cell with curcumin was increased. HSP70 expression is proportional to cells with curcumin concentration.

Conclusions 1. Curcumin has protection and anti-apoptotic effects on hypoxia / reoxygenation cardiomyocyte cells in vitro, and the protective effect of curcumin concentration showing a certain dose-dependent manner.

2. With increasing curcumin concentration, the HSP70 expression in hypoxia/reoxygenation cardiomyocyte cells increase. and intracellular HSP70 expression of hypoxia / reoxygenation cardiomyocyte cells increased with time. Curcumin protective effect of hypoxia / reoxygenation cardiomyocyte cells may be associated with the increased expression of HSP70.

GW23-e1609 THE EFFECT OF OXIDISED LOW-DENSITY LIPOPROTEIN ON NOTCH1 EXPRESSION IN MACROPHAGES
doi:10.1136/heartjnl-2012-302920a.265

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Objectives To explore the expression of Notch 1 by ox-LDL in Macrophages.

Methods Human macrophage from THP1 cell line transform by PMA was cultured with different concentration of ox-LDL for 48 h to induce proinflammatory response. Macrophages were harvested and supernatants were collected for further experiments. The expression of Notch1 mRNA and protein were measured by real-time quantitative PCR (RT-PCR) and Western blot, respectively. The levels of vascular cell adhesive molecule-1 (VCAM-1) and Monocyte chemoattractant protein-1 (MCP-1) were determined by RT-PCR and ELISA, respectively.

Results Our data showed that with ox-LDL challenge, The expressions of Notch1 and the levels of VCAM-1 and MCP-1 significantly increased in macrophages in a dose-dependent manner within some extent compared with that in the control group p<0.05).

Conclusions Notch signalling is activated by ox-LDL stimulation and regulates macrophage functions.

GW23-e1567 S-PROPARGYL-CYSTEINE (SPRC)-INDUCED ANGIOGENESIS AND STAT3-MEDIATED MECHANISMS
doi:10.1136/heartjnl-2012-302920a.266

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Objectives Angiogenesis, a physiological or pathological process characterised by the sprouting of new blood vessels from existing vessels, plays a vital role in ischemic heart disease. Since before hydrogen sulphide was reported to induce angiogenesis in vitro and in vivo, we investigated the possible pro-angiogenic effect of SPRC, a novel water-soluble modulator of endogenous hydrogen sulphide, and revealed STAT3-mediated mechanisms.

Methods Cell viability assay, cell proliferation assay, cell adhesion assay, wound healing assay, Transwell migration assay and tube formation assay were carried out to determine the pro-angiogenic effect of SPRC on endothelial cells in vitro. Matrigel plug assay, rat aortic ring assay, CAM assay and sponge implantation assay were carried out to determine the pro-angiogenic effect of SPRC in vivo. Western blot and immunofluorescence were used to detect the level and location of proteins, respectively. EMSA and CHIP were performed to determine the activation of STAT3 and its downstream promoter.

Results SPRC promoted cell proliferation, adhesion, migration and tube formation of primary HUVEC and increased angiogenesis ex vivo and in vivo. In SPRC-induced angiogenesis, phosphorylation of STAT3 was elevated significantly, followed by activation of some signal molecules, such as MAPK family and Akt pathway. The pro-angiogenic effect of SPRC mediated by STAT3 was confirmed by RNA interference of STAT3. The interaction between VEGFR2 and STAT3 was enhanced after SPRC-treatment. Meanwhile, SPRC induced translocation of STAT3 to nucleus, followed by activation of transcript, especially the promoter of vegfl.

Conclusions Based on the proved pro-angiogenic effect of hydrogen sulphide, we proposed and tested a possible SPRC-mediated angiogenesis in vitro and in vivo. More important, we investigated the relative mechanisms of STAT3, including the activation of transcript and interaction with other signal molecules, in SPRC-induced angiogenesis in human umbilical vein endothelial cells.
GW23-e0095  EFFECT OF ECG CHARACTERISTIC AND CLINICAL PROGNOSIS OF THE SYMPATHETIC ELECTRICAL STORM IN PATIENTS WITH TOMB STONE SHAPE ST SEGMENT ELEVATING ACUTE MYOCARDIAL INFARCTION
doi:10.1136/heartjnl-2012-302920a.267

Objectives To investigate the effect of ECG characteristic and clinical prognosis of sympathetic ventricular electrical storm (VES) in patients with tomb stone shape ST segment elevating acute myocardial infarction (AMI).

Methods 79 cases of sympathetic VES in patients with tomb stone shape ST segment elevating AMI group. Sixty cases of after AMI patients non-VES group. The analysed of ECG shape ST segment elevating AMI group. Sixty cases of after AMI patients non-VES group. The analysed of ECG shape ST segment elevating AMI group.

Results In Tomb stone shape ST segment elevating AMI of sympathetic VES group ∑ST segment elevation amplitude, ST segment elevation leads ST segment reduction amplitude leads ultrashort, QTc interval prolongations, T wave electricity replace, EF index elevation leads ST segment reduction amplitude leads ultrashort, Q wave appears. The clinical occurrence of complications such as pump failure, infarct extension, angina prospector, malignant array mortality ventricular infarction and keep watch on ECG was relationship between clinical features and prognosis among the two groups.

Conclusions For those Tomb stone shape ST segment elevating AMI patients with sympathetic VES who having abnormal ECG indexes, clinical short term prognosis was poor and near die independence danger signal. Adopt PCI and comprehensive measures should be taken to improve prognosis.

GW23-e0071  EMPIRICAL STUDY OF LENTIVIRAL S100A1 TRANSECTION UMBILICAL CORD WHARTON’S JELLY-DERIVED MSCS
doi:10.1136/heartjnl-2012-302920a.268
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Objectives To approach effect of efficiency and growth with Lentiviral transfection Umbilical cord wharton’s jelly-derived mesenchymal stem cells (UW-MSCs) in different multiplicity of infection and time.

Methods Lentiviral with enhanced green fluorescent protein (Lenti-EGFP) infection rat UW-MSCs used flow cytomter (FCM).

Results 56 h after transfection Lenti-EGFP to discover green fluorescence, brightness different, green fluorescence brightness strengthen gradually with cultivate cell time to extend, chalk steady state after 7 days, vis vitaex, generation multiple, cell differentiation information of daughter cell, and appraisal effect of UW-MSCs transfection UW-MSCs. To detect transfection efficiency and fluorescence index number (FI) of Lentiviral transfection UW-MSCs used flow cytomter (FCM).

GW23-e0106  EFFECT OF CELL-CELL DIRECT CONTACT TO MESENCHYMAL STEM CELLS DIFFERENTIATE INTO VASCULAR ENDOTHELIAL CELLS
doi:10.1136/heartjnl-2012-302920a.269
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Objectives To investigate the effect of cell-cell direct contact to mesenchymal stem cells (MSCs) differentiate into vascular endothelial cells (VECs) when MSCs co-cultured with human umbilical vein endothelial cells (HUVECs) in vitro.

Methods MSCs and HUVECs were cultured and identified, and then co-culture. The VEGF levels of experimental group (culture media of co-cultured for 48 h) and control group (MSCs and HUVECs’s mixed culture media after them were cultured alone for 48 h) were confirmed using ELISA assays. Co-cultured for 5 days, The MSC’s expression of fetal liver kinase-1 (Flk-1) and von Willebrandt factor (vWF) and ingestible ability of Dil-ac-LDL was analysed by immunofluorescence staining, and the changes of ultrastructure of co-cultured cells were observed.

Results The VEGF levels of experimental group was significantly higher than control group; In direct contact co-culture system, some MSCs were induced to express Flk-1 protein, and part of the Flk-1 positive MSCs also expressed vWF protein ;some MSCs could phagocytose Dil-ac-LDL; the reduced karyoplasmic ratio and abundant organelles were observed in the co-cultured MSCs by transmission electron microscopy, and cell fusion can be seen.

Conclusions UVECs induce MSCs to differentiate into endothelial cells through direct cell contact by direct co-culture, the mechanism may be closely related to the formation of gap junction and the promotion of VEGF secretion by in direct contact and cell fusion.

GW23-e0512  RISK EVALUATION OF COMBINED DETECTION OF SERUM HCY, CD62P, HS-CRP IN PATIENTS WITH HYPERTENSION
doi:10.1136/heartjnl-2012-302920a.270
1Zhaoyan Zhang, 1Capital Medical University Fuying Hospital, 2Fuxing Hospital

Objectives To explore homocysteine platelet membrane glycoprotein, CD62p microparticles and high-sensitivity C reactive protein level and assess risk stratification in patients with hypertension in order to make early effective treatment.

Methods Using flow cytomtery (FCM) and monoclonal antibody labelling method, to detect serum Hcy, platelet membrane glycoproteins CD62p and Hs-crp levels in 150 cases of hypertension patients and 30 healthy controls.
Results The patients with essential hypertension complicated with coronary heart disease group especially unstable angina group serum Hcy, CD62p, Hs-crp levels were significantly higher than those without coronary heart disease patients with hypertension. Serum Hcy, CD62p, Hs-crp levels were significantly higher than those in the control group.

Conclusions Patients with hypertension in outpatient treatment process for simple serum homocysteine Hcy detection is necessary. Target organ damage in screening on high homocysteine in patients must be performed, timely early effective treatment can bring greater benefit to the patient.

GW23-e0581 STUDY ON THE BIOLOGICAL FUNCTIONS OF P21-ACTIVATED KINASE 5

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Objectives PAK5 is a member of P21-activated kinase (PAK) family, which characterised by a highly conserved amino-terminal Cdc42/Rac interactive binding (CRIB) domain and a carboxyl terminal kinase domain. However, the role of PAK5 in apoptosis remains largely unknown. In this study, we constructed pEGFP-C1-PAK5 and established a stably transfected cell line and the effect of PAK5 on cell apoptosis was examined. The results suggest that PAK5 could inhibit the apoptosis induced by staurosporine.

Methods A. Materials: All the materials used in this study were listed in Table 1. (B) Designation and synthesis of primer: Primers target to PAK5 gene were designed according to GenBank. Forward primer 5'–GAAGATCTCATTTTGGGAAAAG–3' with addition of BglII restriction enzyme recognition site and reverse primer 5'–CGGAATTCTCAGTGATGCCTGT–3' with EcoRI addition of site. (C) Acquisition of PAK5 Coding sequence: We performed RT-PCR (reverse transcription PCR) using total RNA extracting from People fresh placental tissue. Then we used cDNA library as template and the primers to make PCR. Full-length PAK5 cDNA coding sequence (CDS) was cloned. The length is 2160 bp. (D) Construction of eukaryotic expression vector of PAK5 and DNA sequencing. We used T4 DNA ligase to connect the PCR products and pEGFP-C1 plasmid which had both been cut by restriction enzyme EcoRI/BglII. After transforming it into competent cells E. coli DH5α and screening of kanamycin, we picked the positive cloning colony to extract plasmid DNA and made a 0.8% gel electrophoresis identification after EcoRI/BglII cleavage, sequencing by Sangon Ltd. of Shanghai. (E) Establishment of stably transfected cell line: The recombinant plasmid pEGFP-C1-PAK5 was transfected into hela cells by lipofectamine. Then we cultured the transfected cells by G418 (700 mg/l) for 6 weeks 48 h later and propagated hela cells by limited dilution method. Therefore, a stably transfected cell line named hela-PAK5 was established. (F) MTT: We prepared four parallel groups: a. hela cells, b. hela cells, c. hela-PAK5 cells, d. hela-PAK5 cells. Then we added staurosporine into group b and group d after 24 h cultivating. About 5 h later, we added MTT into each group and got OD values of each group by using Microplate Reader.

Results (A) Identification of eukaryotic expression vector. We got two bands by electrophoresis after EcoRI and BglII restriction enzyme cleavage. As shonown in Fig 1, a clear band about 2000 bp in agarose gel can be seen as expected according to the gene sequence. The other band is about 4700 bp which is the expression vector pEGFP-C1. It suggests that PAK5 gene was introduced into pEGFP-C1. (B) DNA sequence analysis: After sequencing analysis of recombinant plasmid of pEGFP-C1-PAK5, we confirmed that the inserted fragment was PAK5 gene by BLAST. The result of DNA sequence is showed in figure 2. (C) Application MTT method for hela—pak5 cells survival: The cells with staurosporine compared with the control group are different, and the apoptosis are detected p<0.05. While the hela-PAK5 cells with staurosporine compared with the control group cells are the same. It is shown that the hela-PAK5 cells can resist apoptosis (p>0.05) (figure 3).
old adults (age≥60 years) (p<0.05). And the means of fasting body mass index (BMI), waist circumference (WC) and waist-to-hip ratio (WHR) significantly decreased in individuals with AA, AG and GG genotypes of rs60254222 in old adults (p<0.05), but not in general and young population (p>0.05). The logistic regression analysis showed that GG genotype of rs60254222 variation might be a obesity protective factor in old adults (OR=0.578, 95% CI 0.401 to 0.833, p=0.003).

Conclusions The present study suggests rs60254222 polymorphism in the BMP7 gene may be associated with obesity in old Uygur Chinese.

GW23-e1525 THE COMPLEMENT C1Q TUMOUR NECROSIS FACTOR-RELATED PROTEIN 1 LEVEL IN PATIENTS WITH SLEEP APNOEA AND PRIMARY ALDOSTERONISM
doi:10.1136/heartjnl-2012-302920a.273
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Objectives To discuss the serum level of complement c1q tumour necrosis factor-related protein 1 (CTRP1) and its related factors in patients with sleep apnoea obstructive sleep apnoea (OSA) and primary aldosteronism (PA).

Methods A total of 28 in patients with confirmed OSA and PA were selected. As controls, 30 cases with OSA and essential hypertensive were matched for apnoea hypopnoea index (AHI) and plasma rennin activity (PRA). The levels of PRA, angiotensin II (AngII) and aldosterone (Ald) were measured by adioimmunodetection and the serum level CTRP1 were determined by ELISA in all subjects.

Results The level of Ald was significantly higher in patients with OSA and PA than that in controls (p=0.037), but no significant difference in the levels CTRP1, pRA, AngII, C-reaction protein (CRP), serum potassium and sodium were detected between two groups. Pearson correlation analysis indicated no correlation between the level of CTRP1 and the levels of Ald, AHI in the whole population but negative correlation with AngII(r=−0.454, p<0.05) in patients with OSA with PA.

Conclusions No difference of the level of CTRP1 was detected between patients with OSA and PA and patients with OSA and primary hypertension. It is the level of AngII rather than aldosterone negatively related to the level of CTRP1 in patients with OSA and PA.

GW23-e1343 SCREENING RELATED GENES BY GENECHIP ON PERIPHERAL BLOOD MONOCYTIC CELLS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION (STEMI) AND EXPRESSIONS OF TNFSF6 AND CYP1A1
doi:10.1136/heartjnl-2012-302920a.274
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Objectives Patients admitted to our ER and CCU from November 2007 to February 2008. Consisting of 11 patients, 7 males and 4 females, mean age 61.44±13.70 years with a range from 33 to 75 years. All cases are diagnosed based on the AMI diagnosis criteria under Chinese Medical Association in 1999, For patients with normal controls with age, sex matching healthy volunteers 10 people, 7 male and 3 female, the average age 53.00±6.55 (52–61). Acute onset in STEMI group hospital diagnosed after extracting cubits 10 ml were immediately into containing 0.05 ml of heparin without bacteria. After acute onset of emergency PCI and conventional treatment, the third day and the seventh day each pump once again were cubits 10 ml; The comparison group: morning, fasting extraction method 10 ml were cubits under the same approach as that for the patients group. PBMCs separation adopts the lymphocyte separate liquid density gradient centrifugation. Using Human Stress & Toxicity Pathway Finder PCR Array screening method of myocardial IRI related gene changes. The validation of expression of CYP1A1 TNFSF6 by Real time PCR. All data to differences with mean±SD. Value of patients and controls were compared by ANOVA analysis. And correlation analysis method, the related to p<0.05 to was statistically significant differences.

Methods Patients admitted to our ER and CCU from November 2007 to February 2008. Consisting of 11 patients, 7 males and 4 females, mean age 61.44±13.70 years with a range from 33 to 75 years. All cases are diagnosed based on the AMI diagnosis criteria under Chinese Medical Association in 1999, For patients with normal controls with age, sex matching healthy volunteers 10 people, 7 male and 3 female, the average age 53.00±6.55 (52–61). Acute onset in STEMI group hospital diagnosed after extracting cubits 10 ml were immediately into containing 0.05 ml of heparin without bacteria. After acute onset of emergency PCI and conventional treatment, the third day and the seventh day each pump once again were cubits 10 ml; The comparison group: morning, fasting extraction method 10 ml were cubits under the same approach as that for the patients group. PBMCs separation adopts the lymphocyte separate liquid density gradient centrifugation. Using Human Stress & Toxicity Pathway Finder PCR Array screening method of myocardial IRI related gene changes. The validation of expression of CYP1A1 TNFSF6 by Real time PCR. All data to differences with mean±SD. Value of patients and controls were compared by ANOVA analysis. And correlation analysis method, the related to p<0.05 to was statistically significant differences.

Results 1. Of the STEMI group, general average STEMI genes that significant changes in 14, which were up regulated the gene expression of significant for 8, were significant down regulated for four genes. The genes expression were up regulated which are cell growth/aging related genes1 (GADD45A), oxidation stress and metabolic related gene 1 (FRDX2), Heat shock related gene 3 (HSFD1, DNABJ1, DNABJ2), and repair DNA damage related gene 1 (RAD50), and apoptosis signal related gene 2 (TNFSF6 TRADD,). Significant down regulated of those genes: the cell proliferation/cancer related gene 1 (CCNG1), oxidation or metabolic stress related gene 2 (CAT, CYP1A1), DNA damage and restoration related gene 1 (ATM).

2. The expression of TNFSF6 in STEMI group is higher than of the healthy group and CYP1A1 was lower than the normal value.

Conclusions 1. The moderation of multiple genes resulting from myocardial IRI due to after PCI with acute myocardial infarction. It provides a more complete view in the complication and complexity of myocardial IRI gene regulation.

2. The quantitative analysis of TNFSF6 and CYP1A1 genes after myocardial IRI in AMI at various stage. They may be involved in the myocardial ischaemia/reperfusion injury physiopathological process.
GW23-e1389 EPLERENONE ATTENUATES MYOCARDIAL FIBROSIS IN THE ANGIOTENSIN II-INDUCED HYPERTENSIVE MOUSE: INVOLVEMENT OF OSTEOPONIN INDUCED BY NADPH OXIDASE

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Objectives Oxidative stress and fibrosis are implicated in cardiac remodelling and failure. We tested whether apocynin and eplerenone could decrease myocardial oxidative stress and attenuate cardiac fibrosis and left ventricular diastolic dysfunction in angiotensin II (Ang II, AII)-induced hypertensive mice. The aim of the present study was to clarify the involvement of OPN which involved in the process of Ang II induced fibrosis and heart failure. First, we examined histological changes and gene expression of NADPH oxidase and OPN in the mouse myocardium with immunohistochemistry, western-blots and RT-PCR. Next, to study the involvement of aldosterone and ROS in regulation of OPN synthesis, the effect of aldosterone receptor blocker (eplerenone), and NADPH oxidase inhibitor (apocynin) on expression of NADPH and OPN in the model mouse were examined. Furthermore, the direct effects of these factors on OPN synthesis were studied using cultured cells to examine the NADPH-OPN signalling pathway.

Methods Animals In our study, all animal protocols were approved by our Institutional Animal Care and Use Committee. 30 8-week-old male C57BL/6 mice were randomised into 5 groups: (1) control group (n=5); (2) Ang II infused mice group (n=5); (3) apocynin treatment group (n=5); (4) eplerenone treatment group (n=5); (5) apocynin and eplerenone cotreatment group (n=5). Ang II infused mice were implanted the osmotic minipump (model 2004, Alza) g/kg/min, keep on 4 weeks. At the same time the mice were also treated with eplerenone (200 mg/kg/day) and cotreatment, designed the treatment as 5 days irrigation and 2 days interval, carried out four courses.

Blood Pressure and Heart Rate Systolic blood pressure (SBP) and heart rate (HR) measurements were done using a tail cuff system (Visitech Systems, NC, USA) at the end of the study. A minimum of 5 preliminary cycles was performed before collecting 10 measurements for each mouse.

Echocardiographic Analysis Transthoracic echocardiography was performed at the end of the study. End-diastolic left ventricular internal diameter (LVIDd), end-systolic left ventricular internal diameter (LVIDs) and left ventricular posterior wall thickness (PW) were measured. Percentage fractional shortening (FS%) and ejection fraction (EF%) was calculated to estimate the cardiac systolic function. The left lateral position was used to obtain an optimal Doppler image quality. The LV inflow tract was interrogated from the apical four-chamber view with the sample volume at the tips of the mitral leaflets. The E wave velocity (E/A) ratio and isovolumic relaxation time (IVRT) were measured as estimates of the cardiac diastolic function.

Histological Analysis For histological analysis, hearts were fixed with 10% formalin by perfusion fixation. Fixed hearts were embedded in paraffin, sectioned at 5 μm and stained with Masson’s trichrome (MT) to enable investigation of the overall morphology and fibrosis. Myocyte breadth was measured from sections stained with hematoxylin-eosin, and suitable cross sections were defined as having nearly circular capillary profiles and nuclei. For measurement of the myocyte breadth, 100 cells (per animal) from the left ventricular lateral-mid free wall were randomly chosen and analysed. The collagen fraction was calculated as the ratio of the sum of the total area of interstitial fibrosis to the sum of the total connective tissue area plus the myocyte area in the entire visual field of the section. Approximately 40 arterial cross sections were examined in each heart.

Assay of Oxidative Stress Myocardial tissues were homogenised in RIPA lysis buffer and the homogenates were used for assay. The tissue level of total glutathione (reduced glutathione/oxidised glutathione (GSH/GSSG)) in the LV was determined by the glutathione reductase and 5,5-dithiobis-(2-nitrobenzoic acid) recycling assay. The activity of glutathione peroxidase (GPx) was determined by using hydrogen peroxide assay, and the rate of disappearance of NADPH was recorded spectrophotometrically (412 nm) at 37°C. The lipid peroxide content of the LV was determined by estimation of malondialdehyde (MDA) contents by using the lipid peroxidation MDA assay kit.

Reverse Transcription–PCR RNA was isolated according to the TRIZOL protocol. The RNA was dissolved in diethylpyrocarbonate-treated water, quantified spectrophotometrically at 260 nm and stored at −80°C. Reverse transcription–PCR (RT-PCR) of myocardial tissues of mice were performed according to the Omniscript Reverse Transcription Handbook. Message expression was quantified with the use of the Lightcycler instrument (Roche) with SYBR green dye. The mouse primers used for amplification of NOX1, NOX2, NOX4, OPN and GAPDH, as an internal control, were designed according to the manufacturer’s instructions. RT-PCR was performed with an ABI PRISM7700 Sequence Detection System by the relative standard curve method. The target amount was determined from the relative standard curves constructed with serial dilutions of control total RNA.

Western Blotting Previously frozen heart tissues were extracted with RIPA lysis buffer containing protease inhibitor, minced with scissors and sonicated for 10 s on ice. Homogenates were pelleted at 12000 g for 15 min at 4°C, and supernatants were collected for western blotting. Protein concentrations were determined using the Bradford protein assay. Tissue lysates were incubated overnight at 4°C with specific antibodies to NOX1, NOX2, NOX4, OPN and β-actin. After incubation with horseradish peroxidase (HRP)-conjugated secondary antibody, immune complexes were detected using the enhanced chemiluminescence method. Proteins levels from western blots were evaluated by quantifying the band intensities using ImageJ software (National Institutes of Health).

Immunohistochemistry Hearts were embedded in paraffin, and 5 μm cross sections were cut. After 10 mmol/l citrate buffer antigen retrieval, the sections were incubated with NOX1, NOX2, NOX4 and OPN polyclonal antibody, followed by an incubation for 30 min at room temperature with fluorescence-conjugated secondary antibody or visualised with HRP/diaminobenzidine. Three independent fields in perivascular regions of myocardium from each mouse were examined under a 20×10 objective lens, and the positive cells were counted.

Cell Cultures Cardiac fibroblasts were from ventricles of Balb/c mice and grown in DMEM with 10% fetal bovine serum as previously described. Experiments were performed on secondary cultures. Cells were plated in MULTI-WELL 6-well plates for 12 h in serum-free DMEM media, then treated with Ang II (10−5 mol/l) for 4 h. Some cells were pretreated with eplerenone (10−5 mol/l), apocynin (10−5 mol/l) for 30 min and then stimulated with Ang II (10−7 mol/l). The relative NOX1, NOX2, NOX4, OPN levels were determined by western blots.

Statistical Analyses Data are presented as mean±SEM and were analysed using one-way analysis of variance (ANOVA) followed by...
Tukey or Bonferroni methods for post hoc analysis and two-tailed t-test when appropriate. A value of p<0.05 was considered statistically significant.

**Results** Blood Pressure and Heart Rate. Ang II treatment elevated blood pressure in mice and apocynin or eplerenone treatment didn’t significantly reduce the Ang II-induced elevation of blood pressure. Apocynin and eplerenone co-treatment significantly lowered blood pressure of the Ang II infused mice. (The blood pressure of each group was 116.4±5.0, 166.7±13.6, 150.2±16.8, 138.3±21.9, 133.8±9 mm Hg, respectively.) The co-treatment group significantly deceased heart rate compare with the groups through the treatment of Ang II.

**Cardiac Hypertrophy** Ang II-induced increase of HW/BW (radio of heart weight to bodyweight, 4.4±0.1 in sham vs 6.6±0.6 in Ang II, p<0.05) was partly inhibited by apocynin or eplerenone treatment and significantly inhibited by combination treatment (5.6±0.5 in cotreatment vs 6.6±0.6 in Ang II, p<0.05). Ang II-induced increase of LVW/BW (radio of left ventricular weight to bodyweight) didn’t abolish by apocynin or eplerenone or combination treatment. As the same, Ang II treatment significantly increased myocyte breadth of the mice, however apocynin or eplerenone or combination treatment almost didn’t work.

**Cardiac Fibrosis** Quantitative analysis of percentage fibrotic areas confirmed a significant increase in AngII-treated (47.1%±3.1%, p<0.05) compared with sham mice (15.2%±0.2%). Fibrotic areas in apocynin, eplerenone and combination treated mice were significantly attenuated (32.4%±1.5%, 29.8%±1.4% and 29.0%±0.8%, respectively, p<0.05) as compared with AngII alone.

**Cardiac Function and Remodelling** To investigate cardiac function, we performed echocardiographic examination. Posterior wall thickness (PW), end-diastolic left ventricular internal diameter (LVDd), end-systolic left ventricular internal diameter (LVEDs) did not differ between any of the groups. LV systolic function was measured by ejection fraction (%EF). There were no significant differences in EF % between the five groups, while with the slightly impaired LV systolic function in Ang II-treated mice. Moreover, LV diastolic function was evaluated by isovolumic relaxation time (IVRT). This parameter was increased in WT mice after Ang II treatment, reflecting the impaired LV diastolic function. Apocynin or eplerenone treatment decreased IVRT but not showed significance compared with All-treated mice. LV diastolic function was significantly improved by combination treatment.

**Myocardial Oxidative Stress** The GSH/GSSG ratio was decreased and MDA levels were increased after Ang II treatment in mice, indicative of increased myocardial oxidative stress. However, both the GSH content and the activity of GPx remained unchanged in these hearts. Treatment of mice with apocynin and eplerenone and combination inhibited the decrease in the GSH/GSSG ratio and the increase in MDA levels in the heart, respectively. Treatment with apocynin and eplerenone and combination didn’t affect myocardial GSH content or Gpx activity.

**Expression of OPN, NADPH oxidase Protein** Immunohistochemical staining for OPN, NOX1, NOX2, NOX4 and PKCζ was performed. There was no OPN staining in hearts from WT mice. Hearts from Ang II-treated mice exhibited OPN staining that was mainly present in the interstitium. Apocynin or eplerenone or combination treatment markedly blunted the Ang II-induced OPN staining. There was little NOX1, NOX2, NOX4 and PKCζ staining in hearts from WT mice and clearly abrogated in apocynin or eplerenone or combination treatment group. With apocynin and eplerenone treatment, OPN protein level was 28% and 39% lower, respectively, than with Ang II treatment alone (p<0.05). Western blot and RT-PCR showed the consistent result with the immunohistochemical staining. Effects of Ang II, apocynin, eplerenone, and inflammatory/Fibrotic Cytokines on OPN Synthesis by Cardiac Fibroblasts in Culture. The direct effects of Ang II, apocynin and eplerenone on OPN protein expression of cardiac fibroblasts in culture were examined by western blot. Ang II (10−7 mol/l) significantly increased OPN protein levels. Cells which treated with apocynin caused a decrease of OPN expression in a dose-dependent manner. Eplerenone significantly downregulated the OPN and PKCζ expression in Ang II treated cardiac fibroblasts.

**Conclusions** The results of the present study add the available evidences that apocynin and eplerenone partly prevent pathological remodelling of the heart in Ang II-induced hypertensive mice and also explain the mechanisms underlying the benefits of their coadministration. These findings suggest the potential involvement of NADPH-OPN pathway in regulation of the following process in Ang II-induced diastolic heart failure mice. Although further studies are necessary to elucidate the complex multistep molecular pathways involved, induction of OPN by eplerenone in the hypertensive heart might be a key step in perivascular fibrosis and thus a prime target for therapy.

**GW23-e2288 STUDY ON CORRELATION OF P2Y12 GENE POLYMORPHISMS IN RS9848789 AND RS2046934 SITES WITH CORONARY HEART DISEASE**

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**Objectives** To investigate correlation of P2Y12 gene polymorphisms (rs9848789 and rs2046934) with coronary heart disease.

**Methods** 90 health control individuals and 364 patients with coronary artery disease who were diagnosed by coronary angiography or coronary artery CT angiography were enrolled in the study. The single nucleotide polymorphisms (rs9848789 and rs2046934) of P2Y12 gene were detected by MALDI-TOF mass spectrometry. Compare the genotypes and allele frequencies in the two groups.

**Results**

1. Genotypes and frequencies of P2Y12 gene polymorphisms (rs9848789) in control group and coronary heart disease group both were CC genotype.

2. Genotypes and frequencies of P2Y12 gene polymorphisms (rs2046934) in control group and coronary heart disease group were as below: CC genotype 4.4% vs 2.5%; CT genotype 21.1% vs 26.1%; TT genotype 74.4% vs 71.4%. There was no significant difference between control group and coronary heart disease group (p=0.40).

**Conclusions** Single Nucleotide Polymorphisms of P2Y12 gene polymorphisms in rs9848789 and rs2046934 are not associated with coronary heart disease.

**GW23-e2279 P13K/AKT/ENOS/HSP70 MEDIATES ATORVASTATIN POST-CONDITIONING AGAINST MYOCARDIAL ISCHAEMIA-REPERFUSION INJURY IN TYPE 2 DIABETIC RATS**

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Conclusions Our data suggests that activation of the upstream PI3K-Akt-eNOS pathway and up regulation of the downstream protein HSP70 contribute to atorvastatin post conditioning cardioprotection in type 2 diabetic rat.

GW23-e2262 STUDY ON CORRELATION OF P2Y12 GENE POLYMORPHISMS IN RS6798347 AND RS6787801 SITES WITH CORONARY HEART DISEASE
doi:10.1136/heartjnl-2012-302920a.278
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Objectives To investigate correlation of P2Y12 gene polymorphisms (rs6798347 and rs6787801) in control group and coronary heart disease group and to explore the association between the polymorphism and clopidogrel resistance.

Methods 90 health control individuals and 364 patients with coronary artery disease who were diagnosed by coronary angiography or coronary artery CT angiography were enrolled in the study. The single nucleotide polymorphisms (rs6798347 and rs6801273) of P2Y12 gene were detected by MALDI-TOF mass spectrometry. Compare the genotypes and allele frequencies in the two groups.

Results Compared with I/R group, different dosage (0.1, 0.5, 1.0 or 2.0 mg/kg) of atorvastatin intervention significantly decreased IS (p<0.01, each dosage), cTnT (p<0.01, each dosage) and Flameng score (p<0.05, each dosage), and increased myocardial expression of phosphorylated Akt (p<0.05, each dosage), phosphorylated eNOS (p<0.05, each dosage) and HSP70 (p<0.05, each dosage), with a dose-dependent manner. As compared to I/R group, LY294002 intervention (PI3K group, combined intervention of atorvastatin and LY294002) abolished atorvastatin- afforded cardio protection, with no significant differences in IS (p>0.05), cTnT (p>0.05), Flameng score (p>0.05) as well as myocardial expression of phosphorylated Akt (p>0.05), phosphorylated eNOS (p>0.05) and HSP70 (p>0.05) between groups.

Conclusions Our data suggests that activation of the upstream PI3K-Akt-eNOS pathway and up regulation of the downstream protein HSP70 contribute to atorvastatin post conditioning cardioprotection in type 2 diabetic rat.

GW23-e2265 STUDY ON CORRELATION OF P2Y12 GENE POLYMORPHISMS IN RS9859552 AND RS6801273 SITES WITH CORONARY HEART DISEASE
doi:10.1136/heartjnl-2012-302920a.279
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Objectives To investigate correlation of P2Y12 gene polymorphisms (rs9859552 and rs6801273) with coronary heart disease.

Methods 90 health control individuals and 364 patients with coronary artery disease who were diagnosed by coronary angiography or coronary artery CT angiography were enrolled in the study. The single nucleotide polymorphisms (rs9859552 and rs6801273) of P2Y12 gene were detected by MALDI-TOF mass spectrometry. Compare the genotypes and allele frequencies in the two groups.

Results 1. Genotypes and frequencies of P2Y12 gene polymorphisms (rs9859552) in control group and coronary heart disease group both were GG genotype.
2. Genotypes and frequencies of P2Y12 gene polymorphisms (rs6801273) in control group and coronary heart disease group were as below: CC genotype 10.0% vs 13.7%; CT genotype 40.0% vs 44.5%; TT genotype 50.0% vs 41.8%. There was no significant difference between control group and coronary heart disease group (p=0.33).

Conclusions Single Nucleotide Polymorphisms of P2Y12 gene polymorphisms in rs9859552 and rs6801273 are not associated with coronary heart disease.

GW23-e2342 THE RELATIONSHIP BETWEEN P2Y12 GENE POLYMORPHISMS AND CLOPIDOGREL RESISTANCE IN PATIENTS WITH CORONARY HEART DISEASE
doi:10.1136/heartjnl-2012-302920a.280
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Objectives The antiplatelet efficacy of clopidogrel has a large interindividual variability. Polymorphisms in the P2Y12 gene have been suggested to contribute to this variability. The aim of this study was to investigate the contribution of P2Y12 genetic polymorphisms in rs6798347 in patients with coronary heart disease, and to explore the association between the polymorphism and clopidogrel resistance.

Methods A total of 91 patients with coronary artery disease were enrolled, which were diagnosed by coronary arteriography or coronary artery CT angiography. Platelet function was assessed by ADP-induced light-transmittance aggregometry after the patients received adequate clopidogrel pretreatment. Patients were divided into two groups (group of clopidogrel resistance and group of non-clopidogrel resistance) according to the ADP-induced platelet aggregation percentage. The genotype of P2Y12 (rs6798347) was detected by Mass ARRAY Time of Flight Mass Spectrometry. Compare the relationship of two groups of genotype and allele frequency distribution. And find the different in platelet aggregation percentage and severity of coronary artery lesion in different genotypes.

Results Based on the ADP-induced platelet aggregation percentage, 30 patients with clopidogrel resistance were selected. Remaining 61 were defined as non-clopidogrel resistance. Baseline characteristics were balanced between the two groups, except for the cholesterol total and low density lipoprotein ((4.1±1.12) mmol/l vs (4.81±1.34) mmol/l, p=0.015), (2.18±0.81) mmol/l vs (2.57±0.89) mmol/l, p=0.049). Ninety patients were genotyping successfully. In the clopidogrel resistance group, the polymorphisms of rs6798347 sites CG, AA, AG genotype frequencies are 14, 5 and 10(48.28%, 17.24% and 34.48%); the other group are 33, 5 and 23(54.10%, 8.20% and 37.70%). There is no different in genotype frequency between this two groups (p>0.05). Also there is no different in ADP-induced platelet aggregation percentage and severity of coronary artery lesion in different genotypes (p>0.05).

Conclusions These date suggest that the Single Nucleotide Polymorphisms of P2Y12 in rs6798347 is not associated with clopidogrel resistance in patient with coronary heart disease.
GW23-e2531 PAYMENT SOURCE, QUALITY OF CARE, AND OUTCOMES IN PATIENTS HOSPITALISED WITH HEART FAILURE
doi:10.1136/heartjnl-2012-302920a.281
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Objectives The study come from University of Chicago Pritzker School of Medicine, USA, which aim was to analyze the relationship between payment source and quality of care and outcomes in heart failure (HF). A total of 99 508 HF admissions from 244 sites between January 2005 and September 2009 were analyzed. Patients were grouped on the basis of payer status (private/health maintenance organisation, no insurance, Medicare, or Medicaid) with private/health maintenance organisation as the reference group. Decreased quality of care and outcomes for patients with HF were observed in the no-insurance, Medicaid, and Medicare groups compared with the private/health maintenance organisation group.

Methods

Results

Conclusions

GW23-e2615 CLINICAL STUDY ON CORONARY HEART DISEASE WITH INCREASING AGE AND RISK FACTORS ANALYSIS
doi:10.1136/heartjnl-2012-302920a.282
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Objectives

1. Coronary heart disease (CHD) is a chronic, progressive, lifelong cardiovascular disease, has become the common disease, frequently-occurring disease. The present study explored the population of CHD epidemiological features and relevant risk factors, evaluated the relationship between aging and CHD.

2. To investigate the relationship between aging, professional difference and coronary heart disease (CHD) in Servicemen and Non-servicemen.

Methods

1. All 1872 objects underwent Judkins of coronary angiography for enrolled in this study from 1 January 2006 to 30 December 2009 in our hospital, compared with group 1 (<40, n=64), group 2 (40-years old, n=208), group 3(50-years old, n=492), group 4 (60-years old, n=554), group 5 (70-years old, n=444), group 6 (80-years old, n=110) of the severity of coronary artery stenosis, lesion of vascular distribution and basic clinical indexes, Gensini integration, through multiple regression analysis related to CHD and age and risk factors.

2. The 221 Servicemen patients and the 1060 Non-servicemen patients underwent preliminary diagnosis of CHD enrolled in this study. The relationship of CHD and risk factors was analysed in six age groups according servicemen and non-servicemen.

Results

1. 1–6 groups prevalence rates were 43.8%, 50.5%, 64.8%, 74.5%, 79.7%, 80%, compared with the <40 age group population, increasing per 10 years of age, CHD risk was increased by 15%, 48%, 70%, 82%, 83%. Male CHD prevalence rate (74.7%) than women (60.4%) (p<0.01). Three vessel disease, prevalence, Gensini integral, along with age increase, 0 lesions decline, and multiple regression analysis showed that age, gender, smoking, alcohol consumption, hypertension, TC, HDL, UA are the independent risk factor for CHD, HDL is a protective factor.

2. Servicemen age was higher than non-servicemen age.(p<0.001). Two groups of disease risk factors, involving the blood vessels count, lesion, Gensini Score no significant difference. With the increase of age, servicemen and non-servicemen Gensini total score gradually increased, non-military personnel 70 years of age, total Gensini score compared to servicemen 80 age group was not statistically significant.

Conclusions

1. Accompany aging, the incidence of CHD risk gradually increased, the extent of disease and the degree is also increasing, male, smoking, hypertension, TC are risk factors for CHD, HDL is the protective factors.

2. With aging, coronary artery disease gradually increased. In the same risk factors, the same degree of atherosclerotic lesions, non-military than military aged about 10 years earlier, suggesting that in addition to traditional risk factors, social environment, different professional levels is a risk factor for coronary heart disease.

GW23-e2602 EPIDEMIOLOGIC STUDY ON THE CHARACTERISTICS OF HYPERTENSION IN THE RURAL AREA OF HEILONGJIANG PROVINCE
doi:10.1136/heartjnl-2012-302920a.283
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Objectives The aim of this study was to study the epidemiologic characteristics of hypertension in the rural area of Heilongjiang province, report the rates of prevalence, awareness, treatment, and control of hypertension, and analyze their associated risk factors.

Methods A cross-sectional survey was conducted in the 11 countries of Lan Xi, Ping Shan town of HeiLongjiang province randomised. A total of 5272 people aged 15 years and over were recruited as study participants. Information on the hypertension was obtained using a standard Questionnaire, measurement of blood pressure (BP), height, body mass, biochemical indicator. The criteria for diagnosis of hypertension were the 2005 revised China Guidelines for the management of hypertension. According to the Guideline, hypertension is defined as a systolic BP is 140 mm Hg and above, or/and diastolic BP 90 mm Hg and above, or people had hypertensive history or using antihypertensive drug. According to age, participants were separated into 7 groups, and analyze the rates of awareness, treatment, and control of hypertension and Logistic regression analysis of associated risk factors.

Results The standardised prevalence of hypertension was 25.06%, male 28.35%, female 22.02%. The rates of awareness, treatment, and control of hypertension were 39.80%, 17.40%, and 2.69% respectively. Multiple logistic regression analysis revealed that body mass index, alcohol consumption, the high level of triglyceride, the low level of high density lipoprotein, family history of hypertension, and serum glucose were risk factors of hypertension in the rural area of HeiLongjiang province.

Conclusions Hypertension were highly prevalent in the rural area of HeiLongjiang province, and lower the rates of awareness, treatment, and control of hypertension. There were many their own associated risk factors in this area. It suggested the necessity to enhance standardise administration in the rural area of HeiLongjiang province, and improve three degree doctors the ability on prevention and treatment of hypertension, and reduce the prevalence of angiocardiopathy and cerebrovascular disease.
Clinical Analysis of 64 Cases of Atrial Myxoma Surgery Under Superficial Hypothermia and Extracorporeal Circulation Without Heart Beating Cese

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Objectives: To investigate means and effect on surgical treatment of atrial myxoma under superficial hypothermia and cardiopulmonary bypass (CPB) without heart beating cease.

Methods: Clinical data and surgical treatment of 64 patients with primary atrial myxoma from January 2003 to March 2012 were retrospectively reviewed. All of atrial myxoma excised under general anesthesia with superficial low temperature extracorporeal circulation on beating heart.

Results: The CPB time was 19–84 min (mean 44.6±15.2 min). All of 53 cases of left atrial myxoma and 7 cases of right atrial myxoma and four cases of double atrial myxoma were respected successfully and without cerebral embolism or gas embolism etc. postoperative complications occurred, and without death in period of operation, they were all myxoma recovered. The patients were followed up for 1 month–9 years with a follow-up rate of 85.9%. All of cases didn’t relapsed after operation nine patients were lost to follow-up.

Conclusions: Atrial myxoma should be early performed after diagnosis results suggested that intracardiac procedures on pump beating-heart with superficial hypothermia cardiopulmonary bypass is safe and available in patients with atrial myxoma.

Study on Assessment Index of Curative Effect of Myocardial Fibrosis Based on Clinical Literature

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Objectives: To collate the assessment index of efficacy of myocardial fibrosis and its related problems, and explore the assessment system of curative effect of myocardial fibrosis by means of literature review.

Methods: With the application of basic research method of litera- ture review, the clinical literature of myocardial fibrosis is taken as the object of study, and the data of assessment index of curative effect is extracted and normalised, to establish a systematic analysis library of clinical treatment literature.

Results: Abnormal heart tissue reconstruction characterised by myocardial fibrosis is the core of pathological changes of a variety of chronic cardiovascular disease (such as hypertension, myocardial infarction, viral myocarditis, etc.), and the primary cause of their persistent, recurrent and permanent uncovered state. At present, the assessment index of curative effect of myocardial fibrosis can be divided into the following categories: (1) the assessment index reflecting curative effect of disease which cause the myocardial fibrosis, such as the index evaluating the step-down rate of hyperten- sion, blood pressure load and blood pressure trough/peak ratio, the circadian rhythm of blood pressure, the index evaluating the mortality of myocardial infarction, cardiovascular events, the incidence of complications, and the index assessing the efficacy of premature ventricular beats, left ventricular systolic function and immune injury of viral myocarditis patients; (2) the assessment index reflecting the myocardial fibrosis, such as carboxyterminal propeptide of type I procollagen (PICP), carboxyterminal propeptide of type III procollagen (PIII NP), hyaluronic acid (HA), laminin protein (LN), and Left Ventricular Remodelling Index; (3) the assessment index reflecting the quality of life, such as generic scale and disease-specific scale; (4) the assessment index reflecting the characteristic of Traditional Chinese medicine, for example, syndrome integral scale, which is not sufficient, unified and acknowledged by now. Assessment index of TCM curative effect should reflect the characteristics of TCM which consist of holism concept and syndrome differentiation and treatment. Currently, some scholars try to establish a domain system named as clinical outcome scale reporting by Chinese doctors’, laying the foundation for the establishment of assessment method and index system of curative effect which consistent with TCM characteristics.

Conclusions: In terms of clinical indicators selection, the assessment index of curative effect of myocardial fibrosis should be as sensitive, specific, acknowledged as possible, and attention should be paid to the complimentarily of indicators; in respect of the establishment of clinical indicator system, attention should be paid to the constitutive and hierarchical properties of indicators, to establish a comprehensive evaluation method with decided significance of each indicator and their relationship.

Construction and Identify of Prokaryotic Vector of TIMP-3

Duanlianxin Sunxin, Tiandan Gaoxin, A Sunxin. Beihua University

Objectives: constructing prokaryotic vector of Timp-3 (tissue inhibitor of metalloproteinase-3) and identify it.

Methods: The total RNA was extracted from human placenta tissues, amplify the gene by RT-PCR and the fragmental gene connect T vector, then clong. And cut Timp-3-pMD18-T by BamHI and XbaI. Agrose gel electrophoresis observe the result. After cut by BamHI and XbaI, enzyme must succeed, sequencing the same like Timp-3 in CNKI, This plasmid was reserved into E. coli DH5α.

Results: By agrose gel electrophoresis identification: We can get Timp-3 gene fragment after cut Timp-3-pMD18-T by Sangon Biotech (shanghai) Co. Ltd. Sequence, the result same to Gene Bank’s Timp-3 gene, and approve right for construction and identify of prokaryotic vector of Timp-3.

Methods: The total RNA was extracted from human placenta tissues. The first, we have prepare RNA-free water, and use RNA-free glass bottle, put DEPC in ultra pure water to 0.1% final concentration, after agitate pass the night, autoclave sterilisation. Secondly, We have collect 0.1 g tissue that the tissue is pulv human placenta, after mix 500 ml of RNAAiso plus, homogenate, quiescence at room temperature for 5 min, add to chloroform of 1/5 RNAAiso Plus volume, joggle and durchmischung for 15s. After quiescence at room temperature for 5 min, 12 000 r/min centrifugal 15 min at 4°C. Make supernatant into the new append off tube. Add equal volume isopropanol the same as supernatant, quiescence at room temperature for 10 min, 12 000 r/min centrifugal 10 min at 4°C. Abandon supernatant, put 75% alcohol into sedimentation with 1 ml to purge sedimentation, 12000 r/min centrifugal 15 min at 4°C. Abandon supernatant and keep the sedimentation, and evaporate sedimentation for 5–10 min in the air, then add disposal.
water by DEPC with 20 µl, we have get total RNA. Then by agrose gel electrophoresis identification, and keep total RNA to −80°C. In reserve primer express

Device sense and antisense restriction enzyme cutting site, they are BamHI, XbaI. Sense: 5'-CGGGATCCATCCCTTTGGCTCGGGCTCATC-3'; antisense: 5'-GCTCTAGAGGTTCTGTGGCGATTGATGATGC-3'. This primer synthesised by Sangon Ltd. of Shanghai.

RT-PCR

MgCl2 2 µl, 10×RT Buffer 1 µl, dNTP 1 µl, RNase Inhibitor 0.25 µl, AMV 0.5 µl, oligodt 0.5 µl, total RNA 4 µl, we use dis- posal water by DEPC to 10 µl, durationmischung, 42°C 30 min, 99°C 5 min, to compose the first chain of cDNA. At the moulding board of reverse transcription outcome, add 5×PCR Buffer 10 µl, Taq enzyme 0.25 µl, sense 0.5 µl, antisense 0.5 µl, we use disposal water by DEPC to 50 µl amplification PCR: rise in temperature for 2 min at 94°C, 94°C 30 s, 55°C, 30 s, 72°C 90 s, amplification 50 circles, stretch for 7 min at 72°C. Then by agrose gel electrophoresis identification to PCR production, and observed result.

Cut by BamHHand XbaI

Get above DNA 1 µl, BamHII µl andfor 1 µl, 10×KBuffer 1 µl, high pressure double distilled water 15 µl, put it for 5 h at 57°C. Then, agrose gel DNA fragment purification by agrose gel electrophoresis identification, and observed result.

TA linkage and conversion

pMD™18-T Vector 1 0.5 µl, InserDNA3 4.5 µl, solutionI5 µl, total volume is 10 µl. Put above liquid in competent cell of 200 µl, and put all liquid on ice for 30 min. Mix LB culture media of 1790 µl, oscillating culture for 1 h at 37°C, 4000 rpm centrifugal 10 s, abandon supernatant, by LB culture media of 200 µl suspend again. Put bacterial liquid shop in LB agar plate contain ampicillin, spread on everywhere, put it 20~30 min at room temperature, and culture it for 12 h to 16 h in coastveus at 37°C.

Screening bacterial colony

Picking monoclon bacterial colony after conversion, and make the germ a lot of proliferation, then we have extract plasmid. The plasmid is cut by BamHHand XbaI, agrose gel electrophoresis identify product after cut by BamHHand XbaI, sequencing by Sangon Ltd. of shanghai, continue to have the culture.

Results

Picking total RNA

Picking total RNA with trizo reagents, the result by agrose gel electrophoresis is figure 1.

Appraisal of amplificative production by RT-PCR

Total RNA of human placenta tissues amplificative through RT-PCR, we can see specificity band by agrose gel electrophoresis in the shadow of 635 bp, equal to expect segment magnitude as figure 2.

After link Timp-3 gene and pMD™18-T cut this, as Fig.3. Through BamHHand XbaI were cut, by agrose gel electrophoresis, we can see clear band in the shadow of 2692 bp and 635 bp as figure 3.

By Sangon Ltd. of shanghai sequencing, as in figure 4.

Appraisal of amplificative production by RT-PCR

Total RNA of human placenta tissues amplificative through RT-PCR, we can see specificity band by agrose gel electrophoresis in the shadow of 635 bp, equal to expect segment magnitude as figure 2.

After link Timp-3 gene and pMD™18-T cut this, as figure 3. Through BamHHand XbaI were cut, by agrose gel electrophoresis, we can see clear band in the shadow of 2692 bp and 635 bp as figure 3.

By Sangon Ltd. of shanghai sequencing, as in figure 4. through inhibit MMPs’ activity and induced cells apoptosis’ functional locus isolated N-extremity structural domain, C-extremity structural domain have function to combine ECM. Because of these function, constructing prokaryotic vector of Timp-3 this experiment, Our studies aim to research function of atheroma, treat tumors to lay a foundation, through inhibit MMPs’ activity and induced cells apoptosis’ functional locus isolated N-extremity structural domain, C-extremity structural domain have function to combine ECM. Because of these function, constructing prokaryotic vector of Timp-3 this experiment, Our studies aim to research function of atheroma, treat tumors to lay a foundation.

Conclusions

This study evaluated the prevalence of classic CHD risk factors in female patients with AMI aged ≤56 and compared it with female patients with AMI more than 56 years old and also with the male patients with AMI. 286 patients with AMI who presented in the Cardiology Department, Regional Hospital of Durres, Albania between January 2011 to March 2012 were included in the study. (9 pts female age≤56, 67 pts female age>56 and 210 pts male). All subjects underwent detailed evaluation of cardiovascular risk factors. Patients were screened for the presence of diabetes mellitus, hypertension smoking and history of ischaemic heart disease in their first degree relatives. Lipid profile was recorded from the investigation chart of every patient.

Results

Diabetes was detected to be the most frequent coronary risk factor (29.2%) in young women with AMI. The prevalence of diabetes was 23.4% in women with AMI. Women with premature AMI (≤56 years old) were found to have a higher prevalence of diabetes compared to older women (29.2% vs 18.1%) p<0.01). The number of diabetics was significantly higher in women than men (23.4% vs 13.9%). The number of diabetics was significantly higher in younger women than younger men (age≤56, 29.2% vs 13.3%). Hypertension was second risk factor in younger female group and the most common risk factor in older female group (20.8% vs 33.3%). Cigarette smoking was found to be the least common factor in the younger female group but the most common in the younger male (27.5% vs 64.1%). Mean age in men was 60.29±10.84, mean age in women was 68.88±8.51 (p<0.001). The mean age of female AMI patients was only 8.6 years more than male MI patients, which is less than the 10 years delay of MI in females reported in the literature. There were not statistical differences between women and men for history of ischaemic heart disease and lipid profile.

Conclusions

Our study show a higher prevalence of diabetes in young females compared with both older females and males with AMI. The higher prevalence of DM in young females may be associated with the decreasing difference of mean age between female
and male patients with MI. This data may be useful in directing primary and secondary preventive measures.

**Objectives** The aims of this study was to estimate the prevalence, awareness, treatment, and control of hypertension in the general adult population in west china.

**Methods and Results** Data were obtained from sphygmomanometer. Measurements and an administered questionnaire from 16152 Chinese adults ≥18 years of age who participated in the 2007 five regions (Chengdu, Chongqing, Guiyang, Kunming and Xi’an) survey. In 2007, prevalence of hypertension was 14% in west china, ≥40.5 million adults were hypertensive. Prevalence rate increased gradually with aging, and this became more obvious from 35 years old and beyond. The prevalence was higher among men than women (16% vs 12%, p<0.001), and the prevalence of hypertension was higher in urban than rural areas (17% vs 11%, p<0.001). Among hypertensive patients, only 43% aware of their high blood pressure, 32% were taking antihypertensive medication, and 12% achieved blood pressure control (<140/90 mm Hg). The awareness rate, treatment rate and control rate of hypertension in urban were 48%, 38% and 17% respectively, were higher than those of rural areas significantly (36%, 25% and 6%, p<0.001). Conclusions-Compared with prevalence (%) from 1991, hypertension prevalence increased rapidly in West China. Now one in seven adults is hypertensive, hypertension is highly prevalent in West China. The rates of awareness, treatment and control in West China were higher than that of the national investigation in 1991. However, in West China, the awareness rate, treatment rate and control rate of hypertension are still low, need to be raised especially in rural areas. There is an urgent need to carry out comprehensive hypertension prevention and treatment programmes in communities.

**Conclusions**

**GW23-e2640 PREVALENCE, AWARENESS, TREATMENT, AND CONTROL OF HYPERTENSION IN WEST CHINA**

doi:10.1136/heartjnl-2012-302920a.288

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**Objectives** We have demonstrated previously that angiotensin (Ang) II may upregulate adiponectin expression in hypertrophic cardiomyocytes via the angiotensin type-2 receptor/nitric oxide/cGMP signalling pathway. In this study, we further examined the combined effect of endothelin (ET)-1 and Ang II on adiponectin gene expression and secretion.

**Methods** Neonatal rat ventricular myocytes (NRVMs) were treated with various concentrations of Ang II and (or) ET-1, adiponectin expression was measured by qPCR. Adiponectin release was measured by enzyme-linked immunosorbent assay.

**Results** ET-1 and Ang II induced adiponectin release in a synergistic manner that can be attributed to their synergistic induction of adiponectin gene expression, as evidenced by adiponectin mRNA analysis. Both ETA and ETB receptors seem to be involved. A nitric oxide synthase inhibitor (Nω-nitro-L-arginine methyl ester hydrochloride) and an analogue of cGMP antagonist (Rp-8-Br-CGMP-S) also partly blocked ET-1-mediated up regulation of adiponectin.

**Conclusions** ET-1 and Ang II may boost adiponectin secretion in a synergistic manner, probably through their synergistic induction of adiponectin gene expression in NRVMs. A common mechanism via the nitric oxide/cGMP/protein kinase G signalling pathway may be involved.

**GW23-e1735 SYNERGISTIC INDUCTION OF ADIPOLECTIN GENE EXPRESSION AND SECRETION BY ENDOTHELIN-1 AND ANGIOTENSIN II IN CARDIOMYOCTE**

doi:10.1136/heartjnl-2012-302920a.289

1Bingyan Guo, 1Derong Han, 2Yongjun Li. 1Hebei Gucheng County Hospital, 2The Second Affiliated Hospital of Hebei Medical University

**Objectives** Our previous studies showed carvedilol blocked the abrupt termination of an ethanol regimen promoted the cardiac sympathetic predominance and the life-threatening ventricular arrhythmias in rats. However, the mechanisms by which they do are unclear. Cardiac gap junctions provide the pathway for intercellular current flow, enabling coordinated action potential propagation and contraction. Cell-to-cell coupling is provided predominantly by connexin 43 (Cx-43) channels and its remodeling is supposed to contribute to the abnormal conduction properties and arrhythmias in ventricle. This study was designed to demonstrate the gap junction remodelling, cardiac sympathetic nervous system activity, and the effects of carvedilol on them in rats.

**Methods** Seven-week-old male Wistar rats were pair-fed with a control or 5 g/dl ethanol liquid diet for 48 days and then subjected to 1-day withdrawal, and 1-day withdrawal with 7-day carvedilol (can block the sympathetic nervous system via β1, β2, and α1 adrenergic receptors) pretreatment. Cardiac sympathetic nervous system activity and gap junction remodelling were evaluated based on cellular current flow, myocardial cGMP signalling pathway. In this study, we further examined the combined effect of endothelin (ET)-1 and Ang II on adiponectin gene expression and secretion.

**Conclusions** ET-1 and Ang II may boost adiponectin secretion in a synergistic manner, probably through their synergistic induction of adiponectin gene expression in NRVMs. A common mechanism via the nitric oxide/cGMP/protein kinase G signalling pathway may be involved.

**GW23-e2701 CARVEDILOL PREVENTS THE ETHANOL-INDUCED VENTRICULAR ARRHYTHMIAS BY MODIFYING THE GAP JUNCTION REMODELLING IN RATS**

doi:10.1136/heartjnl-2012-302920a.290

Jinyao Liu, Izumi Takase, Ayako Hakucu, Xu Liu, Atsuuya Fujimya, Jinyao Liu. Department of Legal Medicine, Yamaguchi University Graduate School of Medicine

**Objectives** We have demonstrated previously that angiotensin (Ang) II may upregulate adiponectin expression in hypertrophic cardiomyocytes via the angiotensin type-2 receptor/nitric oxide/cGMP signalling pathway. In this study, we further examined the combined effect of endothelin (ET)-1 and Ang II on adiponectin gene expression and secretion.

**Methods** Neonatal rat ventricular myocytes (NRVMs) were treated with various concentrations of Ang II and (or) ET-1, adiponectin expression was measured by qPCR. Adiponectin release was measured by enzyme-linked immunosorbent assay.

**Results** ET-1 and Ang II induced adiponectin release in a synergistic manner that can be attributed to their synergistic induction of adiponectin gene expression, as evidenced by adiponectin mRNA analysis. Both ETA and ETB receptors seem to be involved. A nitric oxide synthase inhibitor (Nω-nitro-L-arginine methyl ester hydrochloride) and an analogue of cGMP antagonist (Rp-8-Br-CGMP-S) also partly blocked ET-1-mediated up regulation of adiponectin.

**Conclusions** ET-1 and Ang II may boost adiponectin secretion in a synergistic manner, probably through their synergistic induction of adiponectin gene expression in NRVMs. A common mechanism via the nitric oxide/cGMP/protein kinase G signalling pathway may be involved.

**GW23-e2701 CARVEDILOL PREVENTS THE ETHANOL-INDUCED VENTRICULAR ARRHYTHMIAS BY MODIFYING THE GAP JUNCTION REMODELLING IN RATS**

doi:10.1136/heartjnl-2012-302920a.290

Jinyao Liu, Izumi Takase, Ayako Hakucu, Xu Liu, Atsuuya Fujimya, Jinyao Liu. Department of Legal Medicine, Yamaguchi University Graduate School of Medicine

**Objectives** Our previous studies showed carvedilol blocked the abrupt termination of an ethanol regimen promoted the cardiac sympathetic predominance and the life-threatening ventricular arrhythmias in rats. However, the mechanisms by which they do are unclear. Cardiac gap junctions provide the pathway for intercellular current flow, enabling coordinated action potential propagation and contraction. Cell-to-cell coupling is provided predominantly by connexin 43 (Cx-43) channels and its remodeling is supposed to contribute to the abnormal conduction properties and arrhythmias in ventricle. This study was designed to demonstrate the gap junction remodelling, cardiac sympathetic nervous system activity, and the effects of carvedilol on them in rats.

**Methods** Seven-week-old male Wistar rats were pair-fed with a control or 5 g/dl ethanol liquid diet for 48 days and then subjected to 1-day withdrawal, and 1-day withdrawal with 7-day carvedilol (can block the sympathetic nervous system via β1, β2, and α1 adrenergic receptors) pretreatment. Cardiac sympathetic nervous system activity and gap junction remodelling were evaluated based on cellular current flow, myocardial cGMP signalling pathway. In this study, we further examined the combined effect of endothelin (ET)-1 and Ang II on adiponectin gene expression and secretion.
on the heart rate variability, Western blotting, and reverse transcriptase PCR analyses.

Results The results showed that carvedilol inhibited the acute ethanol withdrawal (ie, having followed 48-day continuous ethanol treatment) induced the cardiac sympathetic predominance and gap junction remodelling, as evidenced by the increases in lower-frequency power in heart rate variability, down-regulation of Cx-43 mRNA and protein expressions, and down-regulation of phosphorylated Cx-43 protein expressions.

Conclusions We concluded that acute ethanol withdrawal followed 48-day continuous ethanol treatment may trigger the cardiac sympathetic predominance, which then induce the gap junction remodelling, finally leading to the occurrence of the ventricular arrhythmias. Carvedilol might prevent the acute ethanol withdrawal induced ventricular arrhythmias by modifying the gap junction remodelling via blocking the sympathetic nervous system activity.

Experimental study

GW23-e0999 CDP-CHOLINE IMPROVES THE OUTCOME OF CARDIAC ARREST VERSUS EPINEPHRINE IN RATS

doi:10.1136/heartjnl-2012-302920b.1

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Objectives CDP-Choline is a cholinergic agent which can both stimulate the cholinergic pathway and increase blood pressure. We aimed to investigate the effects of CDP-Choline on the outcome of cardiac arrest in comparison to epinephrine.

Methods Cardiac arrest was induced by asphyxia in 45 rats. After 7 min untreated cardiac arrest, resuscitation was attempted. The rats were allocated to different groups, each group treated by 2 ml/kg saline, 100 μg/kg epinephrine, 250 mg/kg CDP-Choline. The hemodynamic parameters reflecting cardiac function were monitored for 2 h after resuscitation and the hearts were harvested for ultrastructural observation at the end of monitoring.

Results Both epinephrine and CDP-Choline improved the blood pressure during CPR and the rate of return of spontaneous circulation (ROSC). The dP/dtmax and the absolute value -dP/dtmax was significantly decreased in all groups after resuscitation. However, postresuscitation cardiac function in CDP-Choline group and placebo group was better than in epinephrine group. The dP/dtmax and the absolute value of -dP/dtmax began to be higher with CDP-Choline and saline compared with epinephrine. The sections of the left ventricular anterior wall tissue were observed by the electron microscopy. We could find myocardium injured severely when treated with epinephrine. In epinephrine group, oedematous myofilaments, and oedematous mitochondria with destructed crista, were observed in cardiomyocytes. Compared to epinephrine group, less myocardial injury was observed by electron microscopy in CDP-Choline and placebo groups.

Conclusions The first finding of our investigation is that epinephrine had advantages similar to epinephrine in ROSC and MAP during CPR. This indicates that the beneficial effects of CDP-Choline in the improvement of ROSC may be related to its vasopressor effect. Moreover, for the negative inotropic and chronotropic effects of CDP-Choline, we strongly suggested that certain inotropic or chronotropic effects would not compromise initial resuscitation. The second finding of our investigation is that epinephrine had worsen the postresuscitation myocardial dysfunction and acute myocardial I/R injury according to the hemodynamic and cardiomyocytes microstructure observation. On the other hand, CDP-Choline hadn’t worsen postresuscitation myocardial dysfunction and acute myocardial I/R injury compared to saline, although it would stimulate the adrenergic system and increase blood pressure. Previous investigations have demonstrated that cholinergic stimulation has important protection effects on myocardium during acute I/R injury. Combining these together, it is conceivable that the cholinergic protection effect of CDP-Choline on myocardium during I/R injury may play an important role in its effects on CPR, and may produce rather better effects than epinephrine.

CDP-Choline increases the rate of ROSC when given during resuscitation, and it wouldn’t increase the severity of postresuscitation myocardial dysfunction while epinephrine appears to be harmful to postresuscitation myocardial function.
GW23-e1153  

**ACTIVATION OF ERK 1/2 AND SP1 MAY CONTRIBUTE TO THE EXPRESSION OF TISSUE INHIBITOR OF METALLOPROTEINASE-1 INDUCED BY TRANSFORMING GROWTH FACTOR-β1 IN HUMAN PULMONARY ARTERIAL SMOOTH MUSCLE CELLS**

doi:10.1136/heartjnl-2012-302920b.2

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**Objectives** Tissue inhibitor of metalloproteinases-1 (TIMP-1) is considered to play a key role in the development of pulmonary arterial hypertension (PAH). However, the molecular regulatory mechanisms of TIMP-1 in the pulmonary arteries were not very clear, especially in the human pulmonary arterial smooth muscle cells (HPASMCs). This study try to investigate the signalling pathway involved in the regulation of TIMP-1 in HPASMCs stimulated with transforming growth factor (TGF)-β1.

**Methods** Cultured HPASMCs were incubated with different concentrations of TGF-β1 (0, 2.5, 5, 10, 20 or 40 ng/mL) for 24 h, or with 10 ng/mL TGF-β1 for different time (1, 4, 8, 12, 24 or 48 h). Western blot and real-time PCR were employed to detect the protein and mRNA expression of TIMP-1 in HPASMCs, and enzyme-linked immuno sorbent assay (ELISA) was used to detect the secretion of TIMP-1 in the culture medium. Then, the activities of three mitogen-activated protein kinases (MAPK), including extracellular signal-regulated kinase 1/2 (ERK1/2), p38 and c-Jun NH2-terminal kinase (JNK), were respectively inhibited with their specific kinase inhibitors (ERK1/2), p38 and c-Jun NH2-terminal kinase (JNK), respectively inhibited with their specific inhibitors, U0126, SB202190 and SP600125. The protein and mRNA of TIMP-1 were also detected to help distinguishing that which kinase was involved in the regulation of TIMP-1 in HPASMCs induced by TGF-β1. Besides this, mithramycin, a specific inhibitor of Sp1 transcription factor, and curcumin, a specific inhibitor of activator protein-1 (AP-1), were used to block the DNA-binding activity of Sp1 or AP-1 respectively. And electrophoretic mobility shift assay (EMSA), Western blot and real-time PCR were carried out to help confirming that which transcription factor was involved in the regulation of TIMP-1 in HPASMCs.

**Results** Western blot, real-time PCR and ELISA analysis showed that TGF-β1 could time- and dose-dependently enhance the expression and secretion of TIMP-1. Furthermore, TGF-β1 could phosphorylate two kinases of MAPK, ERK1/2 and p38, but not JNK, and the phosphorylation of p38 was weaker compared with ERK1/2. Of these kinases, only the inhibition of ERK 1/2 by U0126 effectively blocked the TGF-β1-induced expression of TIMP-1. Mithramycin also significantly reduced the expression of TIMP-1 via blocking the DNA-binding activity of Sp1. However, the inhibition of AP-1 by curcumin couldn’t achieve this result. Additionally, the results of EMSA showed that TGF-β1 could up-regulate the DNA-binding activity of Sp1, and that U0126 and mithramycin could effectively suppress this activation in a dose-dependent manner.

**Conclusions** TGF-β1 could time- and dose-dependently stimulate the expression and secretion of TIMP-1 in HPASMCs, and ERK1/2 and Sp1 signalling pathways might be involved in these activities.

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GW23-e0905  

**PHYSICAL FEATURES OF THERMORESPONSIVE HYDROGELS PROMOTE ITS EFFECTS ON CARDIAC PROTECTION POST MYOCARDIAL INFARCTION**

doi:10.1136/heartjnl-2012-302920b.3

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**Objectives** Previous studies have exhibited the protective effects of synthesised polymers alone or scaffold for myocardial infarctions (MI) treatment. However, the exact role of synthesised polymers when used for MI treatment is still unknown. Besides that, the suitable degradation time of synthesised biomaterials is still under controversy. In our present study, we synthetise two kinds of poly N-isopropylacrylamide thermoresponsive hydrogel with theoretic different degradation time, and aim to investigate the interaction of physical characteristics and function of the synthesised polymer MI-induced rat model.

**Methods** Two types of poly N-isopropylacrylamide thermoresponsive hydrogel (defined as Gel A and Gel B) were synthesised by our previous report. In vivo hydrogel formation and maintenance were observed and confirmed in male KM mice (20±5 g) to make sure the degradation days of hydrogel in vivo. MI was induced in male Wistar rats (200±20 g) by the ligation of left anterior descending coronary artery. The MI rats were grouped to receive intra-myocardial injection of 100 μl phosphate buffered saline, 3% (w/v) Gel A or 3% (w/v) Gel B solution randomly by intra-myocardium injection. The geometric structure of the hydrogel was also tested by electron scanning microscopy. Echocardiography and hemodynamic analysis were used to evaluate left ventricular systolic and diastolic function. Isolated infarcted or sham myocardium was tailored for contractility measurement in vitro. Western blotting and immunohistochemistry were used for detecting collagen metabolism.

**Results** In vivo degradation investigation showed the bio-degradation time of Gel A is approximate 85 days and the days of Gel B is nearly 28 days. Electron scanning microscopy images exhibited the three-dimensional structure of cross-linked and skeleton-like networks contributing to form holes which could adhere to red blood cells. At the aspect of inhibiting ventricular infarction enlargement, Gel A or Gel B showed no significant difference, while, Gel B performed better than Gel A on improving left ventricular systolic and diastolic function. Isolated infarcted or sham myocardium was tailored for contractility measurement in vitro. Western blotting and immunohistochemistry were used for detecting collagen metabolism.

**Conclusions** Synthesised poly N-isopropylacrylamide hydrogel is an excellent option for MI treatment. Propophysical features may be the potential reason for the effective cardioprotection of the thermoresponsive hydrogel post-MI. Additionally, suitable degradation time of synthesised poly N-isopropylacrylamide hydrogel is a another consideration for biomaterials designing. We deem the physical properties of polyN-isopropylacrylamide hydrogel promote its effects on structural and functional replacement of damaged myocardial tissue.
ABSTRACTS

**Objectives** Presenilin (PS) gene is a novel gene family of causative gene related with familial Alzheimer’s disease. They have been detected not only in the brain, but also in some peripheral tissues including the heart. The main focus on the PS gene family was in central nervous system. RNA interference (RNAi) is a kind of technology including small interfering RNA (siRNA) and microRNA (miRNA). miRNAs are small noncoding RNAs that participate in regulating gene expression at post-transcriptional level. They play important roles in the cell growth, differentiation, proliferation, metabolism, and apoptosis. It has been shown that miRNAs participate in the regulation of a diverse spectrum of cardiac functions with developmental, pathophysiological and clinical implications. Research found that PS2 gene mutations are associated with DCM, with developmental, pathophysiological and clinical implications. They have been believed that PS2 gene regulate the cell apoptosis via mechanism known as Ca2+ induced-Ca2+ release in nervous system. PS2 gene may inhibit the hydrogen peroxide-induced apoptosis of rat H9c2 cells. PS2 gene have been successfully constructed. Transfection of these plasmids can efficiently inhibit PS2 gene expression in protein level of the rat H9c2 cells. PS2 gene may inhibit the hydrogen peroxide-induced apoptosis of rat H9c2 cells.

**Methods**
1. Four miRNAs targeting the PS2 gene were synthesised and inserted into the pCDNA3m6.2-GW/EmmGF miR vectors.
2. The recombinant plasmids were identified and transiently transfected into rat H9c2 cells via lipofectamine 2000. After 48 h of transfection, the transfection efficiency was monitored by inverted fluorescence microscopy and flow cytometry (FCM). The efficacy of RNAi at the mRNA and protein levels were assessed by real-time fluorescent quantitative PCR (FQ-PCR) and Western blot, respectively.
3. The myocardioc cell apoptosis models of rats were established. H9c2 cells was treated with 100 μmol/l Hydrogen peroxide (H2O2) for 12 h, and the apoptosis of H9c2 cells treated by RNAi, compared with those containing control vectors or untreated, were analysed using FCM and Cell Counting Kit-8 (CCK-8) assay.

**Results**
1. The recombinant miRNA expression vectors, which target PS2 gene was successful constructed.
2. Compared with the control group, the expressions of PS2 mRNA in H9c2 miRNA-transfected cells were not significantly down-regulated (p>0.05). However, Western blot demonstrated that the H9c2 cells transfected with PS2 miRNA plasmid resulted in a dramatic down-regulation of PS2 protein (p<0.001).
3. Myocardial H9c2 cells cultivated in vitro were treated with H2O2 (50, 100, 200 μmol/l) in control and experimental groups respectively. Apoptosis was determined by AO-FI double fluorescent staining assay, the results showed that H2O2 could damage H9c2 cells in dose and time dependent way, and induce apoptosis with obviously morphological changes in exposed groups at 12 h, 100 μmol/l level of H2O2 (p<0.05). FCM showed an increased cell apoptosis rate in PS2 miRNA group compared with that in the positive and negative control group (p<0.05). CCK-8 assay revealed that the proliferation inhibitory rate was higher in PS2 miRNA group than in control group (p<0.001).

**Conclusions** The expression plasmids carrying miRNA targeting PS2 gene have been successfully constructed. Transfection of these plasmids can efficiently inhibit PS2 gene expression in protein level of the rat H9c2 cells. PS2 gene may inhibit the hydrogen peroxide-induced apoptosis of rat H9c2 cells.

**GW23-e0933**

**NON-INVASIVE SERIAL MONITORING OFATHEROSCLEROTIC PLAQUE PROGRESSION ANDTHROMBOSIS WITH PET-CT IN A RABBIT MODEL**

**Objectives** To investigate the characteristics of atherosclerotic plaque progression at different stages with PET-CT imaging as well as the feasibility and accuracy of detecting vulnerable plaque using this fused imaging techniques.
Methods Eighteen male New Zealand White rabbits were divided into two groups as follows: atherosclerosis group (n=9, group A), statins group (n=9, group B). Two groups were fed with high cholesterol diet for 2 weeks and balloon injury of abdominal aorta was performed. After that, group A were fed with interrupting high-cholesterol diet for 16 weeks, group B were given high-cholesterol diet for 6 weeks and atorvastatin with normal diet for 10 weeks. By week 18, the rabbits underwent 2 pharmacological triggerings to induce thrombosis within 24 h. During the whole experiment, a total of 4 PET/CT scans were performed on rabbits. The mean standardised uptake values (SUVmean) and maximal standardised uptake values (SUVmax) were measured over the aorta. The rabbits were then euthanised after the last scan; PET-CT data of arterial segments and pathological information of arteries were measured.

Results The result of different stages of atherosclerosis showed that the average SUVmean and SUVmax for baseline scan was 0.607±0.149 & 0.823±0.239; 0.876±0.283 & 0.950±0.335; 0.927±0.234 & 0.999±0.289; 1.287±0.537 & 1.429±0.618. The difference was statistically significant (p=0.000). The result of before triggering for thrombosis scan show the mean SUVmax of group A was 0.873±0.240 & 0.955±0.288; group B, 0.806±0.235 & 0.902±0.276. The difference was statistically significant (p=0.000). The result of before triggering for thrombosis scan show the mean SUVmax of group B with thrombosis was 0.906±0.201 & 1.010±0.216; group B without thrombosis was 0.745±0.234 & 0.837±0.288. The difference was statistically significant (p=0.000). The artery segments with thrombosis and without thrombosis in group A: SUVmean (1.105±0.177 vs 0.762±0.109, p=0.000), SUVmax (1.236±0.280 vs 0.798±0.118, p=0.000), cap core ratio (0.147±0.092 vs 0.304±0.113, p=0.000), the number of macrophage (58.09±16.55 vs 47.30±16.17, p=0.023), all have statistically significant differences. The number of smooth muscle cell (45.14±17.11 vs 50.07±19.25, p=0.039, p=0.344) was not statistically significant. The number of macrophage was positively correlated significantly with SUVmax (r=0.42, p=0.002); the number of macrophage was positively correlated significantly with SUVmax (r=0.386, p=0.005); it has no correlation between cap core ratio and SUVmean (r=−0.531, p=0.000), cap core ratio and SUVmax (r=−0.552, p=0.000). The number of smooth muscle cell was not related to SUVmean (r=−0.065, p=0.645), the number of smooth muscle cell was not related to SUVmax (r=−0.039, p=0.784).

Conclusions 18F-FDP PET-CT fused imaging technology can achieve the combination of anatomy and function. It can comprehensively reflect the features of vulnerable plaque at different stages of progression from minute lesion to plaque rupture.

GW23-e2203
INTERRUPTED DIFFERENTIATION OF RAT NEURAL STEM CELLS TOWARDS SMOOTH MUSCLE CELLS IN VITRO

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Objectives Based on our pilot data, transplanted rat neural stem cells (NSCs) adhered to the vascular basement and began to express levels of smooth muscle a actin (SMA) in vivo. This current study is to investigate the differentiation of NSCs towards smooth muscle cells in vitro.

Methods Rat NSC line was isolated from the subventricular zone and purified using suspension culture technique as previously established in the lab. Rat NSCs were induced to differentiate into smooth muscle cells (SMCs) on type IV collagen coated flasks at 37°C. Cells were then harvested for mRNA and protein extraction at the 1st, 2nd and 4th day in differentiation medium. The mRNA and protein expressions of SMA, smooth muscle myosin heavy chain (SMMHC), smooth muscle protein 22 (SM22) and myocardin were detected using PCR and Western blot. Finally, the differentiating cells on the 4th day were prepared for immunofluorescent staining for SMA and SMMHC markers.

Results

1. Rat NSCs lost their neural shape from the 2nd day of differentiation and acquired a long, spindle-shaped phenotype and started to form a spiral structure on the flasks. On the 3rd day of culture, there was no significant difference between the differentiating Rat NSCs and wild-type SMCs.

2. PCR assays confirmed that the gene expression levels of smooth muscle cell-specific genes (SMA, SM22, SMMHC) and transcription factor (Myocardin) on the 2nd day were significantly increased (p<0.05) as compared to the expression in the 1st day. Similarly, the 4th day were significantly increased when compared with the 1st and 2nd days (p<0.05).

3. Western blot analysis confirmed that the protein expression levels of smooth muscle cell-specific genes and transcription factor gene (SMMHC, Myocardin) on the 2nd day were significantly increased (p<0.05) as compared to the 1st day. Moreover, on the 4th day of differentiation, all 4 genes expression were significantly increased as compared with the 1st and 2nd days (p<0.05).

4. More than 80% of the cultured cells were stained positive for SMA and SMMHC markers. The stainings showed characteristic shapes of the SMCs cytoskeleton, which connects with the cell membrane system extensively.

Conclusions Rat NSCs were induced successfully to differentiate into SMCs on type IV collagen coated flasks at 37°C that has been demonstrated by the expressions of specific SMCs markers. To date, this is the first report that Rat NSCs could differentiate into SMCs. Our results indicate the possibility that neural stem cells could take part in vivo angiogenesis, which would promote neural stem cell transplantation as a future therapeutic alternative for ischaemia neural tissue.
Ischaemia/Reperfusion and Sitagliptin groups were subjected to 30 min of coronary artery occlusion, followed by reperfusion for 2 h, and then the effect of Sitagliptin on the cardiovascular responses was evaluated by detecting changes of left ventricular weight index (LVWI), myocardial cell apoptosis by flow cytometry (FCM), the levels of blood glucose, creatine kinase-MB (CK-MB), lactate dehydrogenase (LDH), malondialdehyde (MDA), glutathione peroxidase (GSH-Px) and superoxide dismutase (SOD) in plasma.

Results The LVWI and the blood glucose level in three groups were nonsignificant differences. The CK-MB, LDH, MDA level and cell apoptosis rate in Sitagliptin group were significantly lower than I/R group (CK-MB: 776.4±44.0 μ/l vs 1359.2±187.2 μ/l, p<0.05; LDH: 1326.9±166.8 nmol/ml vs 2131.1±303.8 nmol/ml, p<0.01; MDA: 39.5±6.3 vs 55.2±3.5 nmol/ml, p<0.01; rate: (20.3±3.1)% vs (28.1±3.3)%, p<0.01), but still higher than those in Sham group (CK-MB: 776.4±44.0 μ/l vs 578.8±60.0 μ/l, p<0.01; LDH: 1326.9±166.8 vs 503.8±188.5 nmol/ml, p<0.01; MDA: 39.5±6.3 vs 26.45±1.9 nmol/ml, p<0.01; rate: (20.3±3.1)% vs (11.7±1.9)%, p<0.01).

Comparing with I/R group, the GSH-Px and SOD level in Sitagliptin group were significantly increased (GSH-Px: 241.8±12.9 μ/ml vs 189.7±19.9 μ/ml, p<0.01; SOD: 234.7±15.1 nmol/ml vs 163.5±23.2 nmol/ml, p<0.01), but still lower than those in Sham group (GSH-Px: 241.8±12.9 μ/ml vs 282.6±15.6 μ/ml, p<0.01; SOD: 234.7±13.1 nmol/ml vs 288.7±20.2 nmol/ml, p<0.01).

Conclusions Our results suggested sitagliptin pretreatment could provide significantly cardio protective effects against ischaemia/reperfusion injury in rats. The mechanisms might be attributed to scavenging lipid peroxidation products, increasing antioxidand-defense enzymes and preventing myocardial cell apoptosis.

**Results**

First, there were statistical differences regarding FGF-2 concentration between coronary venous blood and infarcted myocardium at 5 min (81.13±15.07 pg/ml vs 210.66±65.09 pg/ml, p<0.05) and 10 min (59.80±12.15 vs 124.92±21.31, p<0.05). No difference was found between the two tissues at 15 min. Remarkable FGF-2 gradient can be established between coronary venous blood and infarcted myocardium at 5–10 min after retroperfusion. Second, FGF-2+MSCs group showed more EGFP-positive cells compared with MSCs group. The number of endothelial cells (23.8±6.2/mm² vs 11.4±2.9/mm², p<0.05) and cardiomyocytes (11.3±2.5/mm² vs 8.3±2.2/mm², p<0.05) originating from the injected cells was more in the FGF-2 +MSCs group than in the MSCs group.

**Conclusions**

A stable FGF-2 concentration gradient can be established in vivo between coronary venous blood and infarcted myocardium at 5–10 min after retroperfusion, which can promote homing of MSCs into the infarcted myocardium and differentiation.

**GW23-e2505**

**REGULATION OF RPE BARRIER FUNCTION BY VEGF-B**

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**Objectives**

Vascular endothelial growth factor-B (VEGFB) is a member of VEGF family growth factors. It is abundant in heart, skeletal muscle and eye. To investigate the role of VEGFB in blood-retina barrier function, we examined the effect of VEGFB on RPE barrier function in mice.

**Methods**

Ischaemia was induced by oxygen-induced retinopathy. VEGFB was delivered to the retina intravitreally. The effect of VEGFB on RPE barrier-specific leakage was evaluated in mice with our recently developed fluorescent microscopic assay. Gene expression was analysed with Western blot and RPE barrier integrity was evaluated with immunohistochemistry.

**Results**

Intravitreal injection of VEGFB caused a loss of integrity in the RPE tight junctions in normal mice and exacerbated the severe breakdown of the RPE barrier in ischaemic mice. Mechanistic study showed that VEGFB significantly activated VEGF receptor-1 (VEGFR1) and extracellular-signal-regulated kinase (ERK) in vitro and in vivo.

**Conclusions**

VEGFB regulates RPE barrier function through the activation of VEGFR-1 and ERK1/2. As approximately 30 percent of cases of diabetic macular oedema (DME) are associated with RPE barrier breakdown, VEGFB may be a therapeutic target for DME, a major vision loss in diabetic retinopathy.

**GW23-e2490**

**INTRACELLULAR NO AND CALCIUM IONS CHANGE CAUSED BY EXENDIN-4 IN THE PIG ILIAC ENDOTHELIUM**

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**Objectives**

To investigate the effects of Exendin-4 (Ex-4) on nitric oxide (NO) produced by pig iliac endothelium cells (PIEC) and the relationship with intracellular calcium ions change.
Methods GLP-1receptor (GLP-1R) in the PIEC membrane was detected by immunofluorescence. PIEC were cultured in RPMI 1640 (with calcium)/DMEM (non calcium) nutrient mediumseparately and were treated with various concentrations of Ex-4. NO production and the intracellular calcium concentration were measured using Griess reaction in cell culture supernatants and Flow-Cytometer with the fluorescence probeFluo-2 AM, respectively. The relationship between EX-4 and NO release was evaluated by measuring NO production before and after pretreated by eNOSblocker L-NAME.

Results GLP-1R was expressed in the PIEC. PIEC cultured in DMEM or RPMI 1640 were incubated with six different concentrations Ex-4 (0.5, 1, 2, 4, 8 μg/ml). The NO productions of PIEC in DMEM were 1.39±0.06, 1.38±0.01, 1.33±0.00, 1.61±0.01 and 2.42±0.08 μmol/l, and the productions of cells in RPMI 1640 were 1.41±0.08, 1.57±0.13, 1.46±0.09, 1.54±0.09 and 4.07±0.17. In different culture medium, the NO production of cells processing with 5 μg/ml Ex-4 were significantly higher than all the other concentrations (p<0.05). PIEC were then treat with 5 μg/mlEx-4 at a series of time points from 2 h, 4 h, 5 h, 12 h to 24 h. The NO productions increased gradually (0.53±0.02, 0.61±0.04, 1.44±0.07, 1.02±0.06, 0.15±0.06) and reached the peak 8 h later (p<0.05 vs 0.53±0.02), and then slowly fell to the normal. Together with a higher intracellular calcium concentration when compared with the control group (57.46±1.56 vs 62.38±1.84, p<0.05).

No production in two L-NAME processing groups (L-NAME groups was not significant (p>0.05). The no production of both L-NAME groups was not significant (p>0.05).

Conclusions GLP-1R was expressed in the PIEC. Ex-4 increased NO production in the endothelium cell through activation of eNOS in a dose and time dependent manner, and calcium maybe play an important role in the process.

GW23-e1216 INTEGRATED PROTEOMIC AND METABOLIC ANATION REVEALS NADH-MEDIATED TCA ENERGY METABOLISM DISORDER IN CHRONIC PROGRESSIVE HEART FAILURE doi:10.1136/heartjnl-2012-302920b.12

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Objectives Although great progress has been made in heart failure (HF), it is still the major cause of mortality and morbidity worldwide. Typically, research associated with heart failure has focused on heart failure induced by acute myocardial infarction. However, most clinical HF is gradually generated by chronic progressive heart failure (CHF). A proper model is needed to reveal its identification, quantification, and characterisation, understand the mechanism of heart failure (HF). The initial goal of the present study is to build up a chronic progressive Heart Failure model, characterise the time course and the pattern of regional myocardial contractile function during the development of progressive coronary artery stenosis, since most prior studies on this topic have only collected infrequent measurements. The second goal is to determine the underlying molecular mechanism for CHF.

Methods Here we place ameriod constrictor on the left anterior descending coronary artery (LAD) of the mini-swine. It has a tendency to slowly absorb fluid and swell, thus slowly obstructing the vessel inside the constrictor lumen, which is more in line with changes in clinical development of CHF Dynamic detection of electrocardiogram, echocardiography and coronary angiography are applied to diagnosis the chronic progressive Heart Failure model. Then two-dimensional gel electrophoresis (2-DE)-based proteomics and nuclear magnetic resonance (NMR) and Gas chromatography coupled with mass spectrometry (GC-MS) based metabolomics are applied to investigate its characterisation of the ischaemia tissue, and bioinformatic analysis including Gene Ontology (GO) and KEGG pathway analysis is used to understand the mechanism of chronic progressive heart failure.

Results Based on dynamic detection of electrocardiogram, echocardiography and coronary angiography, the model shows a steady cardiac function from 8 weeks to 12 week, which EF value is about 50%, can be diagnosed as Chronic progressive Heart Failure. What is more, the model shows specific and interesting pathological changes, which ischaemia region only involve bellowing the mitral lesions. Then two-dimensional gel electrophoresis (2-DE)-based proteomics and nuclear magnetic resonance (NMR) and Gas chromatography coupled with mass spectrometry (GC-MS) based metabolomics are applied to investigate its characterisation of the ischaemia tissue, and bioinformatic analysis including Gene Ontology (GO) and KEGG pathway analysis is used to understand the mechanism of chronic progressive heart failure. We find that mitochondrial respiratory chain mediated by NADH is the critical pathway; it leads to down-regulation of important rate-limiting enzyme of citric acid cycle- malate dehydrogenase, which causes insufficient energy supply to the cardiac contractility and relaxation. And what more, we find that the CHF model is not dealt with any lipid intervention, even no high fat diet, the results of proteomics and metabolomics show that visible changes of ApolipoproteinA-I, LDL and VLDL in plasma are seen, myocardial ischaemia can lead to the disorder of lipid metabolism in plasma conversely through glycerolipid metabolism.

Conclusions In present study, we describe a stable and easily reproducible technique to induce CHF model by Ameriod constrictor placing on the LAD. The model closely resembles the CHF in human with respect to structural and functional characteristics which is consistent with the progress of chronic progressive heart failure. NADH-mediated TCA and energy metabolism disorders are the key pathophysiological mechanisms for CHF. Myocardial ischaemia can lead to the disorder of lipid metabolism in turn. Overall, these results provide potential biomarkers for monitoring the therapeutic intervention of CHF and offer important new knowledge for gaining insights into the molecular mechanisms of CHF.

GW23-e1523 EVALUATION OF THE EFFICIENCY AND SAFETY OF ADENOVIRUS VECTOR 9 MEDIATED SERCA2A GENE TRANSFECTION TO MYOCARDIUM BY THREE CARDIAC GENE DELIVERY METHODS IN RATS doi:10.1136/heartjnl-2012-302920b.13

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Objectives To assess the efficacy and safety of adenovirus vector serotype 9 (AAV9) mediated sarcoplasmic reticulum Ca2 +ATPase 2a (SERCA2a) gene transfection to myocardium in normal SD rats by three cardiac gene delivery methods, which are tail vein injection (TVI), direct intramyocardial injection (DII), and open-chest intrapericardial injection, so as to provide a
methodological evidences for the gene therapy of cardiovascular diseases.

Methods The AAV9-SERCA2a-EGFP (EGFP means enhanced green fluorescent protein and it is used as a marker gene) virus vector system was constructed in vitro successfully. According to the three cardiac gene delivery methods, 90 normal SD rats were randomly divided into three groups: TVI group, DII group, and IDI group (n=30, respectively). Each group was divided into three subgroups, which were transfected with 0.9% NaCl, AAV9-EGFP (1.0×10^{11} vg/ml), AAV9-SERCA2a-EGFP (1.0×10^{11} vg/ml) 500 μl, respectively. IDI group was injected with additional collagenase 0.7 mg and hyaluronidase 350 U. At the fourth weekend of the gene delivery, cryosection was analysed by inverted fluorescence microscopy to examine the expression of EGFP in the tissue of heart, liver and kidney. Western blotting was performed to detect SERCA 2a protein level in rats’ tissue. Surface 12-lead ECG was used to record the incidence of arrhythmia. HE staining observed the histopathological changes of the heart, liver and kidney. The changes of cardiac function was measured by Echocardiogram. Blood chemistry indicators were used to assess the changes in liver, kidney and inflammatory factors. Based on the above, so they could evaluate the efficiency and safety in AAV9-SERCA2a gene transfection to myocardium those three gene delivery methods.

Results The whole myocardium of rats which were transfected with AAV9-SERCA2a-EGFP and AAV9-EGFP was filled with green fluorescent in TVI group, and there is no fluorescent in the liver and kidney, or only have a little weak fluorescent in point. In DII group, only green fluorescence was observed in the injected regions, and it was massive or sheet along the needle track, and no expression in liver and kidney. In IDI group, a large number of green fluorescent could be observed in the parietal pericardium, a little in the visceral pericardium and the full thickness of the myocardium, and no expression in liver and kidney. The protein levels of SERCA2a gene of myocardium in DII group and TVI group is significantly higher than IDI group (p<0.05), and the protein levels of SERCA2a of myocardium in DII group is higher than TVI group, but there were no significant difference (p>0.05). ECG showed rats in each group had normal ECG and no obvious arrhythmia, and no significant difference between the experimental group and the control group. HE staining showed that there were some inflammatory cells along the needle track in DII group, which were not observed in TVI group and IDI group. Compared with transferring 0.9% NaCl, there were no significant difference in cardiac function, GPT, GOT, Cr, BUN and CRP in rats which transferring AAV9-SERCA2a-EGFP and AAV9-EGFP.

Conclusions AAV9 is a cardiac-targeted vector. TVI and DII transferring AAV9-SERCA2a gene to the myocardium in rats have the same efficiency and the efficiency is superior to IDI. TVI has the advantage of less trauma without thoracotomy, compared with DII. Transferring AAV9-SERCA2a gene at dose of 1.0×10^{11} vg/ml is safe to the heart, liver and kidney without increasing the incidence of arrhythmia in rats within 4 weeks. Therefore, TVI is more suitable for AAV9 mediated SERCA2a gene transfection to myocardium for gene therapy of cardiovascular diseases compared with DII and IDI. We should choose a reasonable gene delivery method according to the characteristics of viral vector and heart disease.

GW23-e1745 MOLECULAR IMAGING OF ATHEROSCLEROTIC PLAQUE VIA PROFILIN-1 ANTIBODY LABELLED QUATERNISED CHITOSAN ENCAPSULATED MAGNETIC NANOPARTICLES
doi:10.1136/heartjnl-2012-302920b.14

GW23-e1622 TPEN REDUCES CALCIUM OVERLOAD, OXIDATIVE STRESS AND EXHIBITS PROTECTIVE EFFECTS IN PACED HL-1 CELLS
doi:10.1136/heartjnl-2012-302920b.15

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Objectives N, N', N'-tetraakis (2-pyridylmethyl) Ethylenediamine (TPEN), a membrane-permeable zinc chelator, has been demonstrated to modify the intracellular level of calcium and to exhibit antioxidative effects. The present study was to investigate whether TPEN could provide protective effects in atrial fibrillation cells, especially under circumstances of oxidative stress.

Methods Cell models of atrial fibrillation were established by rapid paced HL-1 cells with 600 times per minute (10 Hz/5ms, 1.0 V/cm). These cells were divided into five groups: paced group, in which HL-
1 cells were paced for 2 h with 600 times per minute; control group, in which HL-1 cells were never paced as sinus rhythm control; ONOO− group, in which HL-1 cells were pretreated with ONOO− and then paced; TPEN group, in which HL-1 cells were pretreated with TPEN and then paced, and ONOO−+TPEN group, in which cells were pretreated with ONOO− and TPEN before they were paced. The changes of fluorescence intensity of intracellular calcium ion (Ca2+) were observed with laser scanning confocal microscope. The protein expression of 3-nitrotyrosine (3-NT, a biological marker of peroxynitrite) was detected by Western blot. The occurrence of cardiomyocyte apoptosis was determined by terminal deoxynucleotidyl transferase-mediated dUTP-biotin nick end labelling (TUNEL). Additionally, MTT assay was used to measure the viability of HL-1 cells under different concentrations of ONOO− and TPEN.

Results The fluorescence intensity of Ca2+ within HL-1 cells increased significantly when cells were rapidly paced (p<0.05), and this intensity further increased when paced cells were pretreated with ONOO− (p<0.05). TPEN treatment could significantly reduce the increased level of intracellular Ca2+ induced by rapid pacing (p<0.05) and ONOO− stimulation (p<0.05). Western blot analysis showed that the expression of 3-NT increased dramatically in the paced group as compared to control group (p<0.05) and the same increase was observed in the ONOO− group compared with that in the paced group (p<0.05). Noticeably, the expression of 3-NT decreased prominently in the TPEN group and the ONOO−+TPEN group as compared to paced group (p<0.05) and ONOO− group (p<0.05). MTT assay revealed that ONOO− reduced the viability of HL-1 cells in a dose dependent manner (p<0.01), and 1 μmol/l TPEN could significantly ameliorate the damage caused by ONOO− (p<0.05). Additionally, TPEN significantly reduced the apoptosis index of HL-1 cells induced by rapid pacing (p<0.01) and ONOO− stimulation (p<0.01).

Conclusions TPEN exhibits protective effects in atrial fibrillation cells, especially in circumstances of oxidative stress.

GW23-e1070 ULINASTATIN IMPROVE KIDNEY ISCHAEMIC DUE TO CARDIOPULMONARY RESUSCITATION IN RABBITS doi:10.1136/heartjnl-2012-302920b.16

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Objectives The purpose of the present study was to investigate the protective roles of ulinastatin (UTI) on the kidney medulla after cardiopulmonary resuscitation (CPR) in rabbits

Methods 24 male New Zealand adult rabbits were randomised into two groups (UTI vs normal saline; n=12 per group) after return of spontaneous circulation (ROSC) from 5 min ventricular fibrillation induced by alternating current. The UTI at the dose of 2.5×104 U/kg was administered immediately after ROSC to the animals in UTI group, while NS was performed in the control group. The urinary output was recorded and the serum concentration of BUN and creatinine were detected at 5 different time points, respectively: 4 h, 8 h, 12 h, 16 h, 20 h and 24 h after ROSC. The animals were sacrificed 24 h after ROSC and the kidney medullas sections were analysed to observe the degree of inflammatory cell infiltration, the expression of TNF-α and MDA.

Results 6 rabbits in control group and 6 animals in UTI group survived to the end point of experiment. The urinary output was decreased gradually to the lowest at 8 h–12 h after ROSC and then increased in both groups. The urinary output in UTI group was significantly more than that in control group 8 h after ROSC (p<0.05). The serum concentrations of BUN and creatinine were significantly lower in UTI group than in control group 4 h after ROSC (p<0.05). The myeloperoxidase-positive cells in control group were much higher than in UTI group (p<0.05). The expression of TNF-α and MDA in the kidney medullas in UTI group were lower than in control group (p<0.05, p<0.01).

Conclusions The standard dose of UTI (2.5×104 U/kg) performed in rabbits suffered from CPR may alleviate the degree of inflammatory cell infiltration, decrease the expression of TNF-α and MDA in kidney medulla. UTI had protective effects on the renal function after CPR.

GW23-e2480 ZINC SULPHATE REDUCES THE BODY WEIGHT OF APOE-KNOCKOUT MICE FED WITH HIGH FAT DIET doi:10.1136/heartjnl-2012-302920b.17


Objectives The aim of the present work was to study the effect of zinc sulphate on body weight and perirenal fat weight of ApoE-knockout mice fed with high fat diet and explore its mechanism.

Methods Thirty male ApoE-deficient mice at 8 weeks of age were randomly divided into three groups, including atherosclerotic model group (n=10), low-dose group (n=10), high-dose group (n=10), and using 10 male wild-type C57BL/6J mice as the control group. All the mice were fed with high fat diet for 14 weeks. The control group and atherosclerotic model group mice drank deionised water freely, and both low-dose group and high-dose group mice drank 2.5mmol/l and 25mmol/l zinc sulphate respectively. The initial weight, the last weight, perirenal fat weight and zinc-α-2-glycoprotein mRNA level of perirenal fat were determined in this study.

Results The body weight, weight gain and perirenal fat weight of low-dose group and high-dose group mice significantly lower than the other two groups (p<0.05), the perirenal fat/weight index of low-dose group and high-dose group mice remarkably lower than the other two groups (p<0.05). The zinc-α-2-glycoprotein mRNA level of perirenal fat in low-dose group and high-dose group mice were significantly higher than atherosclerotic model group and control group mice (p<0.05). Furthermore, the zinc-α-2-glycoprotein mRNA level of perirenal fat had a positive correlation with concentration of zinc sulphate.

Conclusions These data suggest that zinc sulphate could markedly decrease the weight gain and perirenal fat weight in ApoE-knockout mice fed with high fat diet. And the underlying mechanisms seem to be related with zinc-α-2-glycoprotein.

GW23-e2472 THE PROTECTIVE EFFECT OF ZINC SULPHATE ON OXIDATIVE DAMAGE OF LIVER IN APOE-KNOCKOUT MICE FED WITH HIGH FAT DIET doi:10.1136/heartjnl-2012-302920b.18


Objectives The aim of the present work was to study the antioxidative effect of zinc sulphate on liver of ApoE-knockout mice fed with high fat diet.

Methods Thirty male ApoE-deficient mice at 8 weeks of age were randomly divided into three groups, including atherosclerotic model group (n=10), low-dose group (n=10), high-dose group (n=10), and using 10 male wild-type C57BL/6J mice as a control group. All the mice were fed with high fat diet for 14 weeks. The
control group and atherosclerotic model group mice drank deionised water, and both low-dose group and high-dose group mice drank 2.5 mmol/l and 25 mmol/l zinc sulphate respectively. The body weight, the liver/weight index, liver function, antioxidant capacity and metallothionein-1 mRNA level of liver were determined.

**Results** The body weight and weight gain of low-dose group and high-dose group mice were significantly lower than the other two groups \((p<0.05)\), the liver/ weight index of control group remarkably lower than the other three groups \((p<0.05)\). The serum alanine aminotransferase \((\text{ALT})\) and aspartate aminotransferase \((\text{AST})\) of low-dose group and high-dose group mice significantly lower than the other two groups \((p<0.05)\). The total antioxidant capacity and superoxide dismutase of low-dose group and high-dose group mice significantly higher than the other two groups \((p<0.05)\), but the malondialdehyde \((\text{MDA})\) of low-dose group and high-dose group mice significantly lower than the other two groups \((p<0.05)\). The metallothionein-1 mRNA level of liver in high-dose group mice significantly higher than atherosclerotic model group mice \((p<0.05)\).

**Conclusions** This study demonstrates that zinc sulphate could markedly decrease the body weight and weight gain in ApoE-knockout mice fed with high fat diet. It also could improve the antioxidant capacity and serum ALT and AST of liver in ApoE-knockout mice. In addition, metallothionein may play active role in the process of antioxidation.

**GW23-e0026**

**SUSTAINED ABDOMINAL AORTA COMPRESSION ELEVATES CORONARY PERFUSION PRESSURE AFTER ASPHYXIA CARDIAC ARREST IN A RABBIT MODEL**

doi:10.1136/heartjnl-2012-302920b.19

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**Objectives** Our study is to investigate whether sustained abdominal aorta compression \((\text{SAAC})\) can improve coronary perfusion pressure \((\text{CPP})\) during cardiopulmonary resuscitation \((\text{CPR})\) and can improve resuscitation outcomes without causing liver laceration.

**Methods** Cardiac arrest was induced by asphyxia in 28 New Zealand rabbits and the cardiac arrest was maintained for 2 min before resuscitation. Animals were resuscitated either by the standard CPR \((\text{STD-CPR group})\) or the standard CPR and SAAC \((\text{SAAC-CPR group})\). Restoration of spontaneous circulation \((\text{ROSC})\), restoration of spontaneous breathing \((\text{ROSB})\) and cerebral parameters were determined. CPP, mean arterial pressure \((\text{MAP})\) and ROSC in the two groups were compared.

**Results** MAP and CPP in the SAAC-CPR group was significantly higher than that in the STD-CPR group throughout the process of basic life support. However, MAP and the blood gas results showed no significant difference between two groups during ROSC. ROSC was attained in seven of fourteen animals in the STD-CPR group and in 11 of 14 animals in the SAAC-CPR group. Five animals in the STD-CPR group and nine in the SAAC-CPR group survived 24 h after ROSC. No liver injury occurred in the two groups.

**Conclusions** SAAC-CPR could increase CPP and MAP during CPR. Furthermore, no liver injury was found with this resuscitation method.

**GW23-e1479**

**EFFECT OF ATORVASTATIN ON SCAVENGER RECEPTOR CLASS B TYPE I EXPRESSION IN THE LIVER OF GOLDEN HAMSTER WITH DIABETES**

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**Objectives** Scavenger receptor class B type I \((\text{SR-BI})\) had been already proved in molecular level as the sole HDL receptor on cellular membrane. SR-BI plays an important role in reverse cholesterol transport \((\text{RCT})\). This study was designed to investigate the effects of atorvastatin on SR-BI expression in the liver of golden hamsters with diabetes mellitus.

**Methods** Thirty-three golden hamsters were included in this study. Six of them were randomly assigned to control group \((n=6)\) and the others \((n=27)\) were fed with high calorie and high fat diet and injected with streptozotocin \((\text{STZ}, 30 \text{mg/kg})\) to induce diabetic model. Twenty-three golden hamsters induced successfully were randomly divided into three groups: \((1)\) diabetes and hyperlipidaemia control group \((\text{DHC group}, n=7)\), \((2)\) diabetes and hyperlipidaemia plus high dose atorvastatin group \((\text{atorvastatin 5 mg/kg/day for 7 days, DHH group}, n=8)\), \((3)\) diabetes and hyperlipidaemia plus low dose atorvastatin group \((\text{atorvastatin 2.5 mg/kg/day for 7 days, DHL group}, n=8)\). Pathological and immunohistochemical change in the liver of golden hamsters were observed. 

**Results** In DHC group the liver was swelling with adipose degeneration. Adipose degeneration of the liver in DHL group and DHH group was improved. SR-BI mRNA and SR-BI protein expression in the liver were similar between DHC group and control group \((p>0.05)\). SR-BI mRNA and SR-BI protein expression in the liver were significantly more in DHH group and DHL group than those in control group and DHC group \((p<0.05)\). SR-BI mRNA and SR-BI protein expression increased more in DHH group than those in DHL group \((p<0.05)\).

**Conclusions** Atorvastatin could dose-dependently up-regulate SR-BI mRNA and SR-BI protein expression in the liver of golden hamsters with diabetes and hyperlipidaemia.
Conclusions Elevated plasma Cer levels correlated with the severity of CHF. The accumulation of ceramide was associated with the hemodynamic status, BNPs levels, circulating pro-inflammatory cytokines TNF-α and hscR, as well as with the soluble apoptosis receptor Fas, suggesting that the sphingolipid signalling pathway is involved in the persistent immune activation and apoptosis associated with CHF and may contribute to the pathophysiology.

GW23-e1651 INTERLEUKIN-6 PROMOTER-634C/G POLYMORPHISM IS ASSOCIATED WITH ATRIAL FIBRILLATION IN ELDERLY HAN CHINESE PATIENTS WITH ESSENTIAL HYPERTENSION
doi:10.1136/heartjnl-2012-302920b.22
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Objectives There is an accumulating body of evidence indicating strong association between inflammation and the pathogenesis of atrial fibrillation (AF). Interleukin-6 (IL-6) is a pleiotropic cytokine, functions as a mediator of inflammatory response and has both pro-inflammatory and anti-inflammatory properties. Three single nucleotide polymorphisms (SNPs) in the IL-6 promoter region (-597G/A; -634C/G and -174G/C) have been reported to influence IL-6 transcription, and -174G/C was in tight linkage disequilibrium with -597G/A. The -174C allele is extremely rare and the -634C allele is common in eastern Asian populations. The aim of this study is to investigate the association of -634C>G polymorphism of IL-6 gene with AF in elderly Han Chinese patients with essential hypertension (EH).

Methods A total of 169 elderly patients with EH were eligible for this study. Patients with AF (n=75) were allocated to the AF group, and 94 subjects without AF to the control group. The PCR-based restriction fragment length polymorphism (PCR-RFLP) technique was used to assess the genotypes frequencies.

Results The distribution of the IL-6 −634C>G genotypes (CC, CG, and GG) was 67.02%, 30.85%, and 2.13% in the controls, and 50.67%, 40.00%, and 9.33% in AF subjects, respectively (p=0.0312). The frequency of the G allele in the AF group was significantly higher than that in the control group (29.33% vs 17.55%, p=0.0103). Compared with the wild type CC, the G allele carriers (CG+GG genotypes) had increased risk of AF in both unadjusted (OR=1.98, 95% CI 1.06 to 3.69, p=0.0312) and adjusted analyses (OR=1.93, 95% CI 1.04 to 3.57, p=0.0364).

Conclusions These findings suggest that IL-6 −634C>G polymorphism is associated with AF and the G allele is an independent risk for AF in elderly Han Chinese patients with EH.

GW23-e1762 THE STUDY OF CONSTRUCTION AND PACKING OF LENTIVIRAL VECTOR-oCT4, sox2, c-Myc, KIf4 AND INFECTING HUMAN SKIN FIBROBLASTS
doi:10.1136/heartjnl-2012-302920b.23
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Objectives To construct and pack Lentivirus vector which includes the four genes as Oct4, Sox2, c-Myc, KIf4, and infect primary cultured human foreskin fibroblasts (HFF). Mainly to illustrate construction and packing of Lentivirus vectors and investigate the optimum condition of target gene over-expression lentivirus particle infecting human foreskin fibroblasts cells.

Methods 1. To acquire objective genes from the plasmid which includes Oct4, Sox2, c-Myc, and KIf4. Enzyme linearised the Lentivirus vector and then directional connected them with objective genes, the production transformed into competent bacteria. Comparison analyzed and sequenced the positive clones, if the result was correct, which was successfully constructed objective plasmid, and then ultra-purified extract endotoxin from the objective plasmid. Use Western Blot to test objective gene expression. Use three plasmid system to transfect 293T cells for packing Lentivirus and test the titer of Lentivirus;
2. Use collagenase I digestion and tissue culture technique to separate and culture HFF, and then use trypsin digestion to separate and culture mouse embryonic fibroblasts (MEF), separately observed the two kinds cells grow, and appraised them with immunocytochemistry SABC method, Mitomycin C processed MEF to set up the feeder which was needed to culture cells;
3. Packed empty lentivirus vector with GFP and infected HFF; fished out the best MOI data; Forth: Randomly divided the third generation HFF in good condition into three group: objective infected gene, empty lentivirus vector, and contrastive group. Polyninfected HFF with lentivirus vector which includes the four genes and consecutive infected for twice. After 4 days, given it condition of stem cells culture, observe the morphological changes to get the best laboratory condition.

Results 1. Successfully constructed and packed Lentivirus vector which includes Oct4, Sox2, c-Myc, and KIf4, the sequence of gene was consistent with objective sequence, titer was 1×10^7 TU/ml;
2. 0.02% collagenase I digestion and attachment explants culture technique can found stable HFF lines in vitro, cells began to migrate after 4 days of cells culture, showed shuttle shape and had arms, after 6 days, major free cells began to form and binding, after 10 days, cells overspread the bottom, tryptic finished digestion and passage. Maximum production and high-activity MEF could be got through 0.0625% trypsin graded digestion method, cells shuttle and polygon shape, and completely attached wall within 24 h. immunocytochemical test prove positive;
3. Treated MEF confluent the 25 cm^2 culture flask with 1 ml 15 μg/ml mitomycin C for 1.5 h, could set up the feeder which was needed to culture cells; Forth: fished out the best MOI was 30; compared with contrastive group, there were no obvious mitopotential stem cells in objective infected gene, but the cells form were changed from shuttle into ellipSe or semi-ellipSe; there were no obvious cells form change of empty lentivirus vector HFF, the cells kept shuttle shape.

Conclusions Successfully primary cultured HFF and MEF; Successfully constructed and packed Lentivirus vectors which includes Oct4, Sox2, c-Myc, and KIf4 with high tite, HFF can be
infected by target gene over-expression lentivirus particle which start to change in morphology.

GW23-e1252 EXPERIMENTAL STUDY OF ULTRASOUND COMBINED WITH NITRIC OXIDE MICROBUBBLES ENHANCE THE EFFICACY OF MESENCHYAL STEM CELLS TRANSPLANTATION IN MYOCARDIAL INFARCTION AND THE PROBABLE MECHANISM
doi:10.1136/heartjnl-2012-302920b.24

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1. Density gradient centrifugation culture method were used in the isolation and cultivation of MSCs. The morphological features and characteristic surface markers were detected by flow cytometry. Use CM-Dil to label MSCs, and observe labelling efficiency under fluorescent microscope.

2. MI model was established by ligation of the left anterior descending coronary artery (LAD), which was assessed with electrocardiogram, serology enzymes, ultrasonography and pathology.

3. Thirty-two rats of MI were equally divided into Ultrsound+NO group (n=15), metformin group (n=15), orally given metformin; GBR group (n=15), orally administrated GBR, for 8 weeks respectively. Blood pressure was measured before modelling and after treatment of 2, 4, 8 weeks. Fasting blood glucose (FBG), total triglyceride (TG) and total cholesterol (TC) and urine albumin excretion (UAE) of rats were observed and recorded. Renal histomorphology with PAS staining was observed by the light microscope. TGF-β1 in kidney was detected by immunohistochemical assay and TGF-β1 mRNA in renal cortex was detected by RT-PCR.

GW23-e2664 THE EFFECTS AND ITS MECHANISMS OF GINKGO BILoba RECIPE ON TGF-β1 IN DIABETIC NEPHROPATHY WITH HYPERTENSION RATS
doi:10.1136/heartjnl-2012-302920b.25

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Objectives To observe the effects of Ginkgo Biloba Recipe (GBR) on transforming growth factor-β1 (TGF-β1) in diabetic nephropathy (DN) with hypertension rats and investigate its mechanisms.

Methods DN with hypertension models were made by 4 weeks high-salt diet with high sugar and fat for male Wistar rats, and intraperitoneal injection of streptozotocin (STZ). The model rats were randomly divided into three groups: untreated model group (n=15); metformin group (n=15), orally given metformin; GBR group (n=15), orally administrated GBR, for 8 weeks respectively. Blood pressure was measured before modelling and after treatment of 2, 4, 8 weeks. Fasting blood glucose (FBG), total triglyceride (TG) and total cholesterol (TC) and urine albumin excretion (UAE) of rats were observed and recorded. Renal histomorphology with PAS staining was observed by the light microscope. TGF-β1 in kidneys was detected by immunohistochemical assay and TGF-β1 mRNA in renal cortex was detected by RT-PCR.

Results The base blood pressure of rats has no significant difference before modelling (p>0.05). After 4 weeks of treatment, compared with model group, blood pressure in metformin group decreased (p<0.01), blood pressure in GBR group was slightly lower (p<0.05). When 8 weeks, the rebound of blood pressure in metformin group is appropriate with the model, the blood pressure of GBR reduced significantly (p<0.01). Compared with model group, FBG, UAE and TG in GBR group and metformin group significantly decreased (p<0.01), TC levels also decreased (p<0.05). The level of TGF-β1 in GBR group and the metformin group decreased (p<0.01), and level of TGF-β1 in GBR group was lower significantly than that in metformin group (p<0.05). The mRNA expressions of TGF-β1 in GBR group and the metformin group were significantly lower than model group (p<0.01). Pathological changes were ameliorated in GBR and metformin group compared with model group.

Conclusions GBR can regulate blood pressure and improve renal functional morphology through down-regulation of TGF-β1 and its mRNA expression in DN with hypertension rats. We initially proved that the inhibition effect of TGF-β1 in GBR is better than metformin, and GBR can lower blood pressure to normal levels with a better step-down smoothly and a long-term efficacy.
**Method**

Develop an animal model of lipid-rich plaque. The paucity of a reliable animal model limits the further research of lipid-rich atherosclerotic plaques by optical coherence tomography (OCT) and intravascular ultrasound (IVUS). The objective of the present study was to examine whether CIH may induce oxidative stress and high blood pressure in Wistar rats.

**Results**

Proliferation of vascular smooth muscle cells (VSMCs) induced by angiotensin II (Ang II) plays a vital role in the pathogenesis of hypertension. In the present study, the effect of reinoside C, a main active ingredient of Polygalafallax Hemsol, on proliferation of VSMCs induced by Ang II was investigated.

**Conclusions**

These results suggest reinoside C attenuates AngII-induced proliferation of VSMC via inhibiting NADPH oxidase- ROS- ERK1/2 phosphorylation and activation of NF-kB as well as mRNA expression of AP-1 and c-myc in VSMCs in a concentration-dependent manner. These effects of Ang II were also inhibited by diphenyleneiodonium (the NADPH oxidase inhibitor), PD98059 (the ERK1/2 inhibitor) and pyrollidinedithiocarbamate (the NF-kB inhibitor).

**Objectives**

In-stent lipid-rich plaque with diffusely bordered, signal-poor regions were identified as peri-strut foam macrophage clusters with or without calcification, fibroatheroma, and ruptures with thrombosis in in-stent neointima.

**Results**

All stents underwent OCT and histology examination. With OCT, total 127 cross-sections and 962 struts were analysed. The 99.75% struts were covered well at 8 weeks after implantation. In-stent lipid-rich plaques with diffusely bordered, signal-poor regions were identified in 23.40% of cross-sections and 87.50% of struts. The histology examination of corresponding images further confirmed the components of in-stent lipid-rich plaque. In-stent lipid-rich plaques were characterised by peri-strut foam macrophage clusters with lipid-rich necrotic core in in-stent neointima.

**Conclusions**

In-stent lipid-rich plaque model was developed successfully in high cholesterol diet rabbit. OCT is a useful tool to detect in-stent lipid-rich plaque features in vivo. The combination of in vivo OCT and the in-stent lipid-rich plaque model may be an important research tool in furthering our understanding and treatment of in-stent plaque in patients underwent stent implantation.

**Objectives**

Proliferation of vascular smooth muscle cells (VSMCs) induced by angiotensin II (Ang II) plays a vital role in the pathogenesis of hypertension. In the present study, the effect of reinoside C, a main active ingredient of Polygalafallax Hemsol, on proliferation of VSMCs induced by Ang II was investigated.

**Methods**

Cell proliferation was measured by two methods; the DNA synthesis and cell cycle were analysed by BrdU marking and flow cytometry. Intraacellular ROS level were determined by measuring the oxidative conversion of cell permeable H2DCF to DCF in fluorospectrophotometer. NADPH oxidase subunits (p22phox, gp91phox), AP-1 subunits (c-fos, c-jun) and c-myc were evaluated by real time PCR. ERK1/2 and IkBα were measured by western blot. The electrophoretic mobility shift assay for determining the NF-κB DNA-binding activity.

**Results**

The results showed that reinoside C attenuated Ang II-induced NADPH oxidase mRNA expression, generation of ROS, ERK1/2 phosphorylation and activation of NF-κB as well as mRNA expression of AP-1 and c-myc in VSMCs in a concentration-dependent manner. These effects of Ang II were also inhibited by diphenyleneiodonium (the NADPH oxidase inhibitor), PD98059 (the ERK1/2 inhibitor) and pyrollidinedithiocarbamate (the NF-κB inhibitor).

**Conclusions**

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**Objectives**

In-stent lipid-rich plaque with diffusely bordered, signal-poor regions were identified as peri-strut foam macrophage clusters with or without calcification, fibroatheroma, and ruptures with thrombosis in in-stent neointima.

**Results**

All stents underwent OCT and histology examination. With OCT, total 127 cross-sections and 962 struts were analysed. The 99.75% struts were covered well at 8 weeks after implantation. In-stent lipid-rich plaques with diffusely bordered, signal-poor regions were identified in 23.40% of cross-sections and 87.50% of struts. The histology examination of corresponding images further confirmed the components of in-stent lipid-rich plaque. In-stent lipid-rich plaques were characterised by peri-strut foam macrophage clusters with lipid-rich necrotic core in in-stent neointima.

**Conclusions**

In-stent lipid-rich plaque model was developed successfully in high cholesterol diet rabbit. OCT is a useful tool to detect in-stent lipid-rich plaque features in vivo. The combination of in vivo OCT and the in-stent lipid-rich plaque model may be an important research tool in furthering our understanding and treatment of in-stent plaque in patients underwent stent implantation.
Additional sections were frozen and stained for macrophages (RAM11) and sma. Then we analysed OCT and IVUS data including plaque incidence rate, plaque type and classification, lipid-rich plaque numbers between the two groups. Histopathological examination of plaque were investigated to confirm our findings. Immunohistochemistry were investigated characterising plaque composition.

**Results** OCT and IVUS both can detect the plaque. But OCT can distinguish the plaque composition and IVUS cannot.

**Conclusions** The vulnerable plaque is the main reason for the acute coronary syndrome. Thus, the judgment of the plaque composition and the accurate diagnosis of vulnerable plaque is an important means of prevention and reduction of acute coronary syndrome. Compared to the traditional IVUS, OCT played a prominent advantage, that is more accurately determination of the composition of the plaque especially for the vulnerable plaque.

**GW23-e1799** EFFECTS OF VALSARTAN AND BENZAZAPRIL ON SERUM SEX HORMONES, GONADO-SOMATIC INDEX AND ERECTION FUNCTION IN SPONTANEOUSLY HYPERTENSIVE RATS

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**Objectives** To evaluate the effects of ACE inhibitor and angiotensin receptor blocker on serum sex hormones, gonado-somatic index (GSI) and erection function in spontaneously hypertensive rats (SHRs).

**Methods** 24 SHRs were distributed initially in three groups: Valsartan group (n=8) received valsartan (30 mg/kg/day) and Benzazapril group (n=8) received benzazapril (10 mg/kg/day) dissolved in 0.5 ml distilled water, the Control group (n=8) received only distilled water (0.5 ml/day). Then 8 Wistar-Kyoto rats (WKYs) (WKY group) were treated with the same as Control group. Body weight, systolic blood pressure (SBP) and sex hormones were measured at baseline and after treatment in all rats. The intracavernous pressure (ICP) and mean arterial pressure (MAP) were measured at the end of treatment course. Then the rats were sacrificed by carotid artery bloodletting, serum was stored to measure sex hormones by electrochemiluminescence assay. The testicles were removed for measuring testicular weight quickly.

**Results** Both valsartan and benzazapril reduced the SBP after treatment with 2 months, but serum testosterone and oestriadiol weren’t reduced. As compared with Valsartan and Benzazapril group, the testosterone of Control group was reduced and the oestriadiol was increased (p<0.05). In addition, pregnenedione of the Control group was lower than the other three groups at 0, 2, 5 V of electrostimulation (p<0.001), the Benzazapril group (p<0.05) and there was no significant difference in the three groups (p>0.05) at 0, 2, 5 V of electrostimulation, respectively. No significant difference of testicle weight and GSI were found in all the groups (p>0.05).

**Conclusions** The serum testosterone was reduced and the oestriadiol was increased in the control SHRs, which harm to the erectile function. Erectile dysfunction in SHRs may be due to oestriadiol-testosterone imbalance.

**GW23-e1763** THE STUDY OF TARGET GENE OVER-EXPRESSION LENTIVIRUS PARTICLE INFECTING HUMAN CARDIAC FIBROBLASTS IN VITRO

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**Objectives** To investigate the optimum condition of target gene over-expression lentivirus particle infecting human cardiac fibroblasts by making lentivirus including the gene of KLF4, OCT4, SOX2, C-MYC.

**Methods** Take the right atrial appendage form patients of coronary heart disease and make human cardiac fibroblasts by the direct adherent culture, take Kunming pregnant mice in 13.5-14.5 days and make embryonic fibroblasts by the trypsin digestion method. Observe cell under the inverted microscope, measure cell viability by trypsin blue assay, identify cell by immunocytochemical staining. Construct and package gene over-expression lentivirus particle of KLF4, OCT4, SOX2, C-MYCand green fluorescent protein. Use lentivirus particle expressing GFP to infect human cardiac fibroblasts, observe fluorescence efficiency under the inverted microscope to get the best infecting condition and multiplicity of infection. Use target gene over-expression lentivirus particle of KLF4, OCT4, SOX2, C-MYC to infect human cardiac fibroblasts, observe the morphological changes to get the best laboratory condition.

**Results** By the direct adherent culture we get enough human cardiac fibroblasts, which contain little mixed-cell and cannot beat spontaneously. By 0.0625% trypsin digestion several times we get stable, sufficient and high-dynamic embryonic fibroblasts, we can get more pure MEFs by spreading to the third generation, then we can make feeder cell with MMC. After contracting and packaging lentivirus successfully, we use them to infect human cardiac fibroblasts, and finally we discover that cells start to change in morphology.

**Conclusions** The study demonstrate that human cardiac fibroblasts can be infected by target gene over-expression lentivirus particle of KLF4, OCT4, SOX2, C-MYC, which start to change in morphology.

**GW23-e1776** EFFECTS OF QI SUPPLEMENT AND BLOOD ACTIVATION PRESCRIPTION AND ITS DISASSEMBLED PRESCRIPTIONS MEDICATED SERUM ON THE EXPRESSION OF RECEPTOR FLK-1, PROTEIN KINASE C, FOCAL ADHESION KINASE BY HUMAN UMBILICAL VEIN ENDOTHELIAL CELL POST-TRANSFECTED VEGF165

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**Objectives** To observe the effects of Qi supplement and Blood Activation prescription (QSBA) and its disassembled prescriptions medicated serum on the expression of vascular endothelial growth factor.

**Conclusions** The study show that the expression of VEGF165 was lower than the control group, which may be due to reduce the VEGF165 level of the cells.
factor (VEGF), and its receptor Flk-1, Protein Kinase C (PKC), focal adhesion kinase (FAK) by Human umbilical vein endothelial cell post-transfected pDNA3.1-VEGF165.

**Methods** Constructing pDNA3.1—VEGF165 restructuring plasmid, then it was transiently transfected in Human Umbilical Vein Endothelial Cells (HUVEC). Prepare Qi supplement and Blood Activation prescription and its disassembled prescriptions mediated animal serum, physiological saline normal serum. Seed the post-transfected HUVEC with 5% serum. The expression of VEGF, Flk-1, PKC and FAK were detected by using Western Blot.

**Results**

1. The expression of VEGF in the Qsba group is higher than the Saline group. There is a significant difference between the two groups (p<0.01). The expression of VEGF in the Blood Activation (BA) group and the Qi supplement (QS) group are lower than the Qsba group. Both groups have statistically significant difference when compare with the whole group (p<0.01).
2. Either the expression of Flk-1 in the Qsba group or in the BA group is higher than the Saline group. Both groups have statistically significant difference when compare with the Saline group (p<0.05). The expressions of Flk-1 in disassembled prescriptions groups are lower than the Qsba group. There is a significant difference when compared with the whole group (p<0.05).
3. The expression of PKC in the Qsba group and its disassembled prescriptions group are higher than the Saline group. All of them have significant with it (p<0.01). The expression of PKC in the disassembled prescriptions groups is lower than the whole group. Both groups have significant with the whole group (p<0.01).
4. The expression of FAK in the Qsba group and QS group are higher than the saline group. Only the Qsba group has a significant difference compare with the saline group (p<0.05). The expressions of FAK in disassembled prescriptions groups are lower than the Qsba group. Both groups have statistically significant difference when compare with the whole group (p<0.05).

**Conclusions** Qsba can not only promote the expression of VEGF but also increase the expression of Flk-1, PKC and FAK. Both BA and QS play roles in this aspect. The role of all parts is better than demolition part. The therapeutic angiogenesis mechanisms of Qsba maybe relate to increase the expression of Flk-1, PKC and FAK, accordingly promote endothelial cell migration, and improve vascular permeability. The specific mechanism remains to be further studied.

**GW23-e0389** EFFECTS OF RENAL SYMPATHETIC DENERVATION ON RATS WITH HEART FAILURE AFTER MYOCARDIAL INFARCTION

**Objectives** In recent years, some clinical trials have demonstrated that Renal denervation (RD) of radio frequency ablation has improved sodium and water retention and the chronic over-activation of the sympathetic nerve system, making the treatment of refractory hypertension achieve a breakthrough. In this study we want to investigate the therapeutic effects of RD on rats with heart failure after myocardial infarction, as well as the optimal time for performing RD and the sustainability of these effects.

**Methods** 120 SPF male Wistar rats (SPF level, 280–330 g) were randomly assigned to six groups, that is, rats with myocardial infarction (MI), rats with RD, rats with RD3+MI (myocardial infarction 3 days after renal denervation), rats with MI1+RD (renal denervation 1 day after MI), rats with MI7+RD (renal denervation 7 days after MI), rats with MI4W+RD (renal denervation 4 weeks after MI) and normal control rats. 8 weeks after MI, the body eight, the left ventricular weight, the urinary volume, the urinary sodium, the left ventricular function, the BNP content in serum, the NE content of cardiac tissue were measured.

**Results**

1. Ligation of the left anterior descending coronary artery in rats induced MI, and the myocardial infarct size was more than 20%. The left ventricular function of MI group significantly declined. Eight weeks after MI, EF and FS of MI group were significantly reduced from 57±4.2% and 42±5.6% to 37±6% and 16±3% (p<0.05). The urine output and urine sodium excretion were markedly reduced from 23.8±1.9 ml and 0.259±0.061 mmol to 14.13±3.8 ml and 0.138±0.019 mmol (p<0.05).
2. Surgically stripping the adventitia of renal arteries and veins, approximately 3 mm from the abdominal aorta can achieve denervation (By observing the blood pressure, heart rate and renal colour changes.).
3. In rats with RD3+MI, MI1+RD, MI7+RD and MI4W+RD the left ventricular function significantly improved compared with that in rats with MI. Additionally, the serum BNP content decreased significantly (p<0.05), the urine output increased (p<0.05), and the urinary sodium excretion also increased but without any significant difference (p>0.05).

**Conclusions** RD has preventive and therapeutic effects on heart failure after MI through improving left ventricular remodelling,
cardiac function and water excretion, and the effects can sustain at least 8 weeks, but there were no significant differences for different time points of denervation. Cardiac function, urine volume and urine sodium in normal rats were not affected by RD (p>0.05). RD was subjected to an in-depth study on the mechanism of improving heart failure after MI.

**Objectives** To investigate how tetrandrine through regulate the pro-inflammatory factors TNF-α, IL-1β, IL-6 to attenuate rat ischaemic/reperfusion injury.

**Methods** 80 male Sprague-Dawley (SD) rats were randomly divided into 4 group: Sham group, ischaemia/reperfusion (I/R) group, Tetrandrine group (Tet) and simvastatin group (Sim). The SD rats underwent 30 min of left anterior descending (LAD) coronary occlusion and 24 h reperfusion to make ischaemia/reperfusion (I/R) injury model in vivo. Sham group were not subjected to occlusion of artery. Tet group were injected tetrandrine to abdominal cavity once, P.O. signiﬁcantly higher than sham group (p<0.01), notwithstanding its activity in T et and Sim groups were signiﬁcantly lower compared with I/R group (p<0.01) and signiﬁcantly higher than sham group (p<0.01).

**Conclusions** Tet can attenuate myocardial ischaemia/reperfusion injury. It achieves this pharmacologic action through reduce the harmful cytokine TNF-α and IL-6, IL-1β.

**ABSTRACTS**

**GW23-e1478**  
TETRANDRINE CONTROL PRO-INFLAMMATORY FACTOR TO REDUCE RAT MYOCARDIAL ISCHAEMIC/REPERFUSION INJURY  
doi:10.1136/heartjnl-2012-302920b.35

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**Objectives** To investigate how tetrandrine through regulate the pro-inflammatory factors TNF-α, IL-1β, IL-6 to attenuate rat ischaemic/reperfusion injury.

**Methods** 80 male Sprague-Dawley (SD) rats were randomly divided into 4 group: Sham group, ischaemia/reperfusion (I/R) group, Tetrandrine group (Tet) and simvastatin group (Sim). The SD rats underwent 30 min of left anterior descending (LAD) coronary occlusion and 24 h reperfusion to make ischaemia/reperfusion (I/R) injury model in vivo. Sham group were not subjected to occlusion of artery. Tet group were injected tetrandrine to abdominal cavity once, P.O. signiﬁcantly higher than sham group (p<0.01), notwithstanding its activity in T et and Sim groups were signiﬁcantly lower compared with I/R group (p<0.01) and signiﬁcantly higher than sham group (p<0.01).

**Conclusions** Tet can attenuate myocardial ischaemia/reperfusion injury. It achieves this pharmacologic action through reduce the harmful cytokine TNF-α and IL-6, IL-1β.

**GW23-e1936**  
ROLE OF ALDOSTERONE IN MYOCARDIAL INJURY DURING HEPATIC ISCHAEMIA/REPERFUSION  
doi:10.1136/heartjnl-2012-302920b.36

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**Objectives** Hepatic ischaemia reperfusion (HIR) injury is common in major liver surgery including liver transplantation and hepatectomy. Furthermore, hepatic ischaemia reperfusion is associated with excess aldosterone production and greatly increases risk of postoperative cardiac complications. The objective of this study was to investigate the role of aldosterone in myocardial injury following HIR.

**Methods** Using a 20 min total warm ischaemia model in rats, heart tissues and blood were sampled at 2~72 h after reperfusion for detection of myocardial damage, myocardial and plasma aldosterone, lipid peroxidation and inﬂammatory factors. Myocardial mitochondrial functions were also compared.

**Results** HIR resulted in myocardial injury early during the reperfusion period (p<0.05). These effects were correlated with enhanced levels of myocardial and plasma aldosterone. The levels of aldehyde dehydrogenase (ALDH2) and calcineurin (CaN) mRNA expression in hearts were decreased by HIR. Administration of spironolactone (20 mg/kg/day, PO) signiﬁcantly attenuated the severity of heart injury and inhibited malondialdehyde (MDA) and tumour necrosis factor (TNF) a, which were elevated by HIR. Moreover, spironolactone signiﬁcantly improved heart mitochondria function and up-regulated ALDH2 expression accompany with the down-regulation of CaN mRNA.

**Conclusions** In conclusion, aldosterone contributes signiﬁcantly to myocardial injury in HIR, and may be a potential therapeutic target for cardiac injury in clinical situations involving remote ischaemia/reperfusion.

**GW23-e1874**  
SIMVASTATIN PREVENT ATHEROSCLEROSIS DEVELOPMENT THROUGH INHIBITING PROTEIN EXPRESSION OF ADHESION MOLECULES  
doi:10.1136/heartjnl-2012-302920b.37

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**Objectives** To explore the effects of simvastatin on protein expressions of intercellular adhesion molecule 1 (ICAM-1), vascular cell adhesion molecule 1 (VCAM-1) and endothelial leucocyte adhesion molecule 1 (E-selectin) of cholesterol diet rabbits and the underlying mechanisms of the beneﬁcial effects of simvastatin on atherosclerosis (AS).

**Methods** Twenty-four male rabbits were randomly divided into three groups: normal diet groups, cholesterol diet groups and the simvastatin groups which received both cholesterol diet and simvas- 

**Conclusions** T et can attenuate myocardial ischaemia/reperfusion injury. It achieves this pharmacologic action through reduce the harmful cytokine TNF-α and IL-6, IL-1β.
ABSTRACTS

GW23-e1359  DIFFERENT PATTERNS OF AORTIC STIFFNESS AND VASODILATION CAUSED BY β-BLOCKERS IN SPONTANEOUSLY HYPERTENSIVE RATS

doi:10.1136/heartjnl-2012-302920b.38
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Objectives This study aims to investigate different patterns of aortic stiffness and vasodilation in spontaneously hypertensive rats treated with β-blockers, with or without vasodilatory properties.

Methods Spontaneously hypertensive rats (SHRs) were treated with metoprolol (200 mg kg$^{-1}$ d$^{-1}$), arotinolol (30 mg kg$^{-1}$ d$^{-1}$), and nebivolol (15 mg kg$^{-1}$ d$^{-1}$) for 8 weeks. Age-matched Wistar-Kyoto rats and untreated SHRs were used as controls. Central arterial pressure and pulse wave velocity were evaluated using carotid pressure transducers. The rings of rat aorta, and renal and mesenteric arteries were evaluated by isometric force recording. Collagen was assessed by immunohistochemistry, while endothelial nitric oxide synthase (eNOS) and eNOS phosphorylation (p-eNOS) were analysed by western blotting. Nitric oxide and reactive oxygen species were measured in human aortic endothelial cells by using fluorescent probes.

Results Data showed that nebivolol and arotinolol, rather than metoprolol, markedly decreased central arterial pressure and pulse wave velocity at week 8, and compared to metoprolol, both nebivolol and arotinolol obviously increased vasorelaxation, aortic vasorelaxation to acetylcholine and p-eNOS/eNOS, and the effects of nebivolol were more pronounced. Besides, aortic collagen deposits in the nebivolol and arotinolol groups were reduced compared with those in the metoprolol group or untreated SHRs. Nebivolol and arotinolol produced more nitric oxide and had higher oxygen radical-scavenging capacities compared to metoprolol in the endothelial cells. Intriguingly, a potassium channel inhibitor (4-aminopyridine) caused a significant reduction in arotinolol-induced vasorelaxation, but not nebivolol.

Conclusions These findings suggested that vasodilating β-blockers with nitric oxide production may cause increased reduction of arterial stiffness via different mechanisms.

GW23-e2369  THE EFFECTS ON PINE POLLEN TO EXHAUSTIVE MICE’S ANTI-FATIGUE CAPABILITY

doi:10.1136/heartjnl-2012-302920b.39
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Objectives In recent years, with the rapid development of competitive sports, people pay more attention on the athletes’ nutrition, especially those with adjust physiology function, targeted to improve the body under hypoxic conditions the sports ability of the substance. However, the exercise supplements with improving the body anti-fatigue capability and safe and effective exercise supplements is still rare. Pine pollen which is a medicinal plant plays a very important role in our country, since the ancient times, people have been put it for food and drug on the market for it can adjust the function of human physiology body physiology. This experiment chooses pine pollen to observe the mice hypoxia and and resist fatigue related metabolic indices of changes after the short-term continuous treatment, in order to provide the theory basis of taking pine pollen for coaches and athletes.

Methods In the experiment, 40 healthy kunming mice are divided into two groups, which are hypoxia group and anti-fatigue e experimental group, each group 20 mice. Every large groups is divided into the treatment group and control group, each group take 10 mice. Give medicine mice pine pollen 4 g/kg/day for three consecutive weeks by irrigating stomach; The control group give normal saline into stomach. We put weight on mice tails of both the control of fatigue group and dosage group, then let them swim to exhaustion for once time. At last we observe the influence of the ability of resisting lack of oxygen in mice, exhaustion of sexual swimming and related blood biochemical index stamina when given drug.

Results In the hypoxia experiment, compared with control group, the mice’s survival time was significantly extended (p<0.01), average extend rate was 36.58%, the longest time to live is improved by 10.11 min. In the anti-fatigue experiment, compared with the control group, the mice of treatment group’s exhaustion swimming time was significantly extended (p<0.01). The treatment group is 30.42% longer than the control group, exhaustion swimming maximum time improve 6.95 min than the control group. Mice in the long time exhaustion after swimming, haemoglobin content, blood sugar levels and lactate dehydrogenase activity than control group (p<0.05), And the two groups of mice’s weight gain no significant difference (p>0.05).

Conclusions In the hypoxia experiment, compared with control group, the mice’s survival time was significantly extended (p<0.01), average extend rate was 36.58% indicates that the extended pine pollen has hypoxia role, indicates the pine pollen delay fatigue condition by the increasing hypoxia tolerance.

In the anti-fatigue experiment, give medicine mice compared with the control group, there are significant differences in the time of swimming and exhaustion of HB, blood sugar, CK which indicates the pine pollen has certain anti-fatigue effect, it also indicates the pine pollen may have the function of nutritional therapy anaemia. This study found that pine pollen can significantly improve the content of the haemoglobin in mice (p<0.05), this may be because pine pollen is rich in protein and iron, and ensure that the red and haemoglobin can be increased, which can improve the body’s aerobic oxidation ability and the ability to clear lactic acid and myocardial and Ge muscle produce protection. Also this study found that pine pollen in mice can significantly improve the blood sugar concentration (p<0.05), this may because pine pollen is rich in simple sugars and polysaccharide. The experimental results show that the pine pollen can significantly enhance mice immediately after exercise the activity of LDH (p<0.05), this may be its important mechanism of fatigue.

In hypoxia and resist fatigue experiments, give medicine group and control group mice’s weight all have growth, but the growth is within the normal scope gr. Treatment group compared with the control group, the weight growth has not seen the obvious difference (p>0.05), which shows that pine pollen has no effect to weight. Also it indicates the pine pollen may reduce weight.
**ABSTRACTS**

**GW23-e2671** PROTECTION OF ECHINOCYSTIC ACID ON THE PRIMARY CULTURED RAT CARDIOMYOCECTES SUBJECTED TO ANOXIA/REOXGENATION INJURY

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**Objectives**

To study the protective effects of Echinocystic acid (Ech) on the primary cultured rat cardiomyocytes subjected to anoxia-reoxygenation (A/R) injury.

**Methods**

The primary cultured neonatal rat cardiomyocytes were pretreated with Ech (0.5 μmol l⁻¹, 5 μmol l⁻¹ and 50 μmol l⁻¹) or Ech (5 μmol l⁻¹) and L-NAME (0.1 mmol l⁻¹), PD98059 (50 μmol l⁻¹) respectively for 1 h, and subjected to A/R injury after 24 h. Cell viability, the activities of SOD and GSH-Px, MDA contents, LDH activity in medium and HSP70 protein expression were measured.

**Results**

Pretreatment with Ech decreased LDH activity and MDA contents, and increased cell viability, the activities of SOD and GSH-Px in a concentration-dependent manner, and increased HSP70 protein expression. The heart protective effects of Ech were partly abolished by L-NAME or PD98059.

**Conclusions**

Pre-treatment with Ech 24 h before ischaemia, can induce delayed cardiac protective effects by activation of NO and MAPK signalling pathways and followed increased expression of HSP70 in rat neonatal cardiomyocytes.

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**GW23-e1550** ALCOHOL ARTERY INTIMAL INJURY HIGH FAT DIET PRODUCED ATHEROSCLEROSIS MODEL

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**Objectives**

To promote atherosclerosis through alcohol artery intimal injury, additional high-fat feeding produced atherosclerosis model, in order to create a convenient, reliable, inexpensive, uniform endothelial injury, operative technique is easy to grasp stability, easy atherosclerosis model.

**Methods**

New Zealand rabbits of either sex, weighing 2.1–2.5 kg, were randomly divided into two groups: high fat diet group and the ordinary particles fed group. High-fat feed processing: 2% cholesterol, 10% lard, 88% the proportion of ordinary particles feed their own preparation. Each rabbit to give each feed 60 to 70 g, 2 times a day, daily water 200 to 250 ml. Feeding for 2 weeks, take ear blood to check blood lipid levels, plasma triglycerides (TG), total cholesterol (TC), low density lipoprotein (LDL) and high density lipoprotein (HDL). Two groups of lipids are significant differences after arterial intimal injury surgery, choose the left carotid artery intimal injury of absolute alcohol, and choose the right carotid artery with normal saline to mimic the arterial intimal injury as controls. Intraperitoneal injection of chloral hydrate (0.1 g/kg) anaesthetised animals, the supine position fixed. Intraperitoneal injection of penicillin 200 000 units before surgery to prevent infection. Dissected carotid artery with normal saline to restore blood flow. Segment vascular injury with silk marker, the specimens were taken to prepare for the next, and the incision was sutured. Saline to mimic the control group only hepamin saline to rinse the vessel lumen. In order to build four models: (1) high fat diet+alcohol arterial intimal injury (2) high fat diet fed+saline arterial intimal injury (3) ordinary particles feeding+alcohol arterial intimal injury (4) normal pellet fed+saline arterial intimal injury. Continue grouping after feeding, respectively after 4 weeks, 8 weeks and 12 weeks to take the ear blood to check blood lipids, respectively, using the enzymatic determination of TC, TG, LDL and HDL. After each group extracted a rabbit cut mark carotid artery with 4% formaldehyde, fixed for 24 h, the ethanol gradient

**GW23-e0442** THE EFFECTION OF SALIDROSIDE ON ND4 PROTEIN IN MYOCARDIAL IN HYPOXIA

doi:10.1136/heartjnl-2012-302920b.41

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**Objectives**

Observe the effeccion of Salidroside (Sal) to the hypoxia myocardial cells and study the mechanism about ND4 protein

**Methods**

Get the hearts out of 20 healthy rats that bore in 24 h. Digest the hearts with trypsame and obtain myocardial cells in vitro. Culture cells in 6 and 96 wells plates. Start the experiment when the cells spread and contact with each others. The cells were divide into four groups, control group, model group, hypoxia+Sal (50 μg/ml) and hypoxia+Sal (100 μg/ml). The mode established with GENbox anaer, Anaero Pack and low glucose culture medium free FBS. The indexes determined were cellular morphology, vitality of cells, LDH of liquid supernatant, activity of complex I, the change of DNA and cell nucleus, the content of ND4 protein.

**Results**

1. Compared with control group, hypoxia+Sal (100 μg/ml) group have few apoptosis cells (p>0.05) and the apoptosis cells were most in model group (p < 0.01); 2. Result of MTT show that the cell’s activity in model group were lower than control group cells (p<0.01). The level of myocardial rose up after adding Sal with different content. 3. The level of LDH in model group rose up observably compared with control group (p<0.01), the level of LDH descend after adding Sal with different content. 4. The activity of complex were least and in control group was most (p<0.01). 5. DNA ladders were emerge in model group and hypoxia+Sal (50 μg/ml) group. On the contrary, there were little DNA ladders in control group and hypoxia+Sal (100 μg/ml) group. 6. Observed cells under microscope, there were too much apoptosis cells in model group compared with control group (p<0.01). 7. The content of ND4 protein in model group was least and in control group was most (p < 0.01)

**Conclusions**

Complex I is the most important coenzymes of the respiratory chain of mitochondrial. ND4 protein is the most important subunit of complex I. Evidence shows that the lack of ND4 protein could make the activity of complex I lost completely. In this study, the content of ND4 protein was increased in hypoxia+Sal groups. It suggest that Sal could protect the myocardial cells in hypoxia by increase the content of ND4 protein.
degeneration, paraffin vertically oriented embedded, each vascular intermittent cross-sectional uniform slices 8 to 10, observed by light microscopy, photography and image analysis, routine HE staining; the observation of blood vessel lumen diameter, intima-media thickness measurement of foam cells.

**Results** After 3 weeks of the high fat diet group lipids began to significantly increased, and 8 weeks to reach the lipid peak, lipid levels begin to decline after 12 weeks. 4 weeks after the gross specimen, see high fat diet+absolute alcohol artery intimal injury compared with the contralateral side of the carotid artery with high fat diet+saline to mimic the arterial intimal injury in carotid artery stiffness, arterial adventitia pale, decreased flexibility, pathological slice prompted intimal thickening performance, endothelial cell proliferation. 8 weeks after the more obvious intimal thickening, endothelial cell proliferation arranged in disorder. Biopsy after 12 weeks and 8 weeks after surgery. High fat diet+saline to mimic the arterial intimal injury, ordinary particles fed+anhydrous alcohol artery intimal injury and particles fed+saline to mimic the arterial intimal injury group after 4 weeks, 8 weeks and 12 weeks from the gross specimen and the biopsy observed no abnormal structure of the normal artery.

**Conclusions** From this set of experiments the following conclusions: (1) Hyperlipidaemia As the formation of vascular endothelial damage the necessary condition for AS. Single hyperlipidaemia or intimal injury alone can not lead to intimal hyperplasia, and prove to the satisfaction of atherosclerotic animal models independent impact factor can not be copied. (2) Alcohol, arterial intimal injury technical operations easy to grasp, stability, uniform endothelial injury, alcohol artery intimal injury additional high fat diet produce atherosclerosis model is a reliable, inexpensive, easy to promote atherosclerosis atherosclerosis model-making methods.

**GW23-e1212**

**IMPACT OF HUMAN HCN4 AND TBX3 GENE CO-TRANSFECTED LENTIVIRUS ON BIOLOGICAL ACTIVITY OF EMBRYONIC STEM CELL (ES)**

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**Objectives** T-box3 (Tbx3) is a family member of the T-box (Tbx) gene, which is a family of transcription factors involved in the regulation of developmental processes. The previous study showed that Tbx3 induced a high-level expression of sinoatrial node (SAN)-specific gene at the heart-transplant region. Hyperpolarisation-activated cyclic nucleotide-gated channel 4 (HCN4 gene), the most abundant subtype of HCN gene in sinoatrial node, played an essential and specific role in the formation of If-channels in the sinoatrial node cells. This study aimed to construct the lentivirus particles that simultaneously carrying with human HCN4 gene, Tbx3 gene and enhanced green fluorescence protein (eGFP) gene and then investigate the impact of co-expression of HCN4 and Tbx3 on the biological activity of mice embryonic stem cell. Results may provide a foundation for further study of rebuilding sinoatrial node cell function through the co-expression of HCN4 and Tbx3.

**Methods** By using the liposome approach, four types of targeting-gene-bound subplasmids (hHCN4-hTbx3-eGFP, hHCN4-eGFP, hTbx3-eGFP and eGFP) and a helper plasmid were packaged respectively. The 293 FT cells were co-transfected with these four types of plasmids respectively, and the virus titre of each type of co-transfected cells was then calculated. Afterwards, the transduction of mice ES cells by the four types of resultant lentiviral plasmid were performed respectively. The morphologies and the degrees of fluorescence expression of the four types of resultant transgenic mice ES cells were observed. The expressions of the target genes were further evaluated through RT-PCR and Western-blot techniques. MTT method was employed to investigate the cellular proliferation and flow cytometry was used to analyse the rate of apoptosis.

**Results** After co-transfection of 293 FT cells with four types of plasmids, the fluorescence microscopic observation showed that all four types of lentivirus particles (hHCN4-hTbx3-eGFP, hHCN4-eGFP, hTbx3-eGFP and eGFP) were successfully constructed which was then confirmed by both RT-PCR and Western-blot. Virus titre of above were 4.7×107TU/ml, 5.2×107TU/ml, 4.5×107TU/ml and 6.65×107TU/ml, respectively. After being transfected by the 4 types of lentivirus, the cells in both hHCN4-eGFP and eGFP group had better cellular morphology and a relatively higher fluorescence rate than that in both hTbx3-eGFP and hHCN4-hTbx3-eGFP groups. Comparing to normal ES cell group, there was no significant difference of the cellular proliferation in both hHCN4-eGFP (p=0.25) and eGFP (p = 0.08) groups by MTT method, while the rates of cell growth in both Tbx3-eGFP and hHCN4-hTbx3-eGFP groups were dramatically decreased (p<0.01). The rates of cell apoptosis in the four groups (hHCN4-hTbx3-eGFP, hHCN4-eGFP, hTbx3-eGFP and eGFP) were 74.53%, 16.29%, 67.64% and 13.06% respectively.

**Conclusions** The lentiviral vectors which simultaneously carrying with HCN4, Tbx3 and eGFP gene were successfully constructed, and also the corresponding highly infectious lentivirus particles were packed, which were effective in the transfection of ES cells. Tbx3 appeared not to promote the proliferation of ES cell, in contrast, to facilitate the apoptosis of ES cell.

**GW23-e1061**

**NONINVASIVE ESTIMATION OF INFARCT SIZE BY ECHOCARDIOGRAPHIC CORONARY FLOW IN A MOUSE MODEL OF MYOCARDIAL INFARCTION**

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**Objectives** Animal model of myocardial infarction (MI) is widely used not only in analyses for the mechanisms but also in testing the efficacy of therapeutic strategies for the disease. It is therefore critically important, but almost impossible to exactly evaluate the validity of coronary artery ligation in a mouse model of MI except analysis by anatomy and histology. We here explore a noninvasive method to estimate MI through analyses for coronary flow by transthoracic echocardiography (TTE) in mice before and 1 day after ligation of left anterior descending (LAD) coronary artery.

**Methods** TTE-based cardiac function, geometry and coronary perfusion, electrocardiogram (ECG), and serum troponin I (Tnl) level were examined in C57BL6/J mice subjected to LAD ligation. Histological infarct size (IS) was confirmed by staining the heart with 2,3,5-triphenyltetrazolium chloride.

**Results** Among all parameters, postoperative hyperaemic peak dia-stolic velocity (PDV) and coronary flow reserve (CFR) were most correlated with IS (R²=0.8028 and 0.5825, respectively, both p<0.0001). With IS>20% as successful LAD ligation (MI+), and IS≤20% unsuccessful one (MI–), receiver operating characteristic (ROC) curve analysis demonstrated that postoperative hyperaemic PDV and CFR most effectively indicated the IS level with the
optimal cut-off value 480.16 mm/s and 1.89, respectively. Furthermore, impaired cardiac function, eccentrically expanded left ventricular, typical pathological ECG and elevated Tnl levels were observed most often in the mice with impaired hyperaemic PDV and CFR.

**Conclusions** Echocardiographic hyperaemic PDV and CFR can estimate histological IS in mice with coronary occlusion.

**GW23-e0099 CONSTRUCTION AND VALIDATION OF A PHARMACOGENETIC REFINEMENT ALGORITHM FOR THE ESTIMATION OF THE WARFARIN DOSE IN CHINESE PATIENTS**

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**Objectives** Pharmacogenetic refinement algorithm on the basis of early international normalised ratio (INR), clinical factors, and genotypes is promising for the accurate prediction of warfarin dose. However, it has never been constructed in Chinese patients. In this study, we aimed to develop and validate a pharmacogenetic refinement algorithm for the estimation of warfarin dose in Chinese patients.

**Methods** A total of 310 Chinese-Han patients under stable warfarin treatment were recruited prospectively and divided randomly into derivation (n=207) and validation cohort (n=103). Genomic DNA extraction for each patients was followed by the genotyping of three genetic variants (CYP2C9*3, VKORC1–1639A/G, and CYP4F2 rs2108622) with the method of SEQUENOM. Clinical and genetic data together with INR value on day 4 of therapy from the patients in the derivation cohort were used to create a pharmacogenetic refinement algorithm. In the validation cohort, the predictive accuracy of the refinement algorithm, and the performance compared with the clinical algorithm and the pharmacogenetic algorithm developed by the International Warfarin Pharmacogenetics Consortium (IWPC) were determined. This prospective study was approved by the Institutional Review Board of the General Hospital of Chinese People’s Liberation Army, and informed consent was obtained from each patient.

**Results** The constructed pharmacogenetic refinement algorithms could explain 52.1% of the warfarin dose variability ($R^2$) in the derivation cohort. In the validation cohort, warfarin dose prediction was significantly more accurate with the pharmacogenetic refinement algorithm ($R^2=45.1\%$, mean absolute error (MAE): 0.65 $\pm$ 0.51 mg/day) than with the clinical algorithm ($R^2=25.6\%$, MAE: 0.75 $\pm$ 0.61 mg/day, p=0.009) and the IWPC algorithm ($R^2=27.7\%$, MAE: 0.81 $\pm$ 0.55 mg/day, p=0.001). When analysed in the subgroups, the pharmacogenetic refinement algorithm showed the best predictive accuracy of warfarin dose in patients with low dose requirement (<$2.25\$ mg/day), patients who carried at least one of the genetic variants (CYP2C9*3, VKORC1–1639 A/G, or CYP4F2 rs2108622 TT) and patients under low intensity anticoagulation (target INR 1.6–2.5).

**Conclusions** Pharmacogenetic refinement algorithm integrating early INR values, clinical factors and genotypes has the potential to improve the accuracy of warfarin dose estimation in Chinese patients.

**GW23-e0550 COMPARATIVE PERFORMANCE OF GENE-BASED WARFARIN DOSING ALGORITHMS IN CHINESE PATIENTS**

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**Objectives** Multiple warfarin pharmacogenetic algorithms have been published and been confirmed to predict warfarin dose more accurately than clinical algorithm or fixed-dose approach. However, their performance in Chinese patients has never been evaluated. We sought to compare the performance of published warfarin pharmacogenetic algorithms in a cohort of Chinese patients under warfarin anticoagulation.

**Methods** The study population consisted of 282 unrelated Han-Chinese patients consecutively admitted to the General Hospital of Chinese People’s Liberation Army between January 2008 and
July 2011. The patients had all undergone warfarin anticoagulation for various indications and were stably controlled with a target international normalisation ratio (INR) of 1.6–2.5. Genomic DNA extraction from each patient was followed by genotyping to detect the polymorphisms of CYP2C9*3 (rs1057910), VKORC1 –1639 G/A (rs9923251), and CYP4F2*3 (rs2108622) respectively, using standard techniques. A total of 8 eligible pharmacogenetic algorithms were selected for performance comparison. The performance of each algorithm was evaluated by calculating the percentage of patients whose predicted dose fell within 20% of their actual therapeutic dose (percentage within 20%), and the mean absolute error (MAE) between each predicted dose and actual stable dose.

**Results** In the entire cohort, the pharmacogenetic algorithms could predict warfarin dose with the average MAE of 0.87 ±0.17 mg/day (0.73–1.17 mg/day), and the average percentage within 20% of 43.8%±3.1% (29.1–52.1%). By pair wise comparison, warfarin dose prediction was significantly more accurate with the algorithms derived from Asian patients (48.6–50.0%) than those from Caucasian patients (29.1–39.7%; OR 1.61–3.56, p<0.02). Algorithms with additional covariates of INR values or CYP4F2*3 performed better than those without the covariates (adding INR: OR: 1.71 (1.08–2.72), p=0.029; adding CYP4F2*3: OR: 2.67 (1.41–5.05), p=0.004). When the patients were stratified according to the dose range, the algorithms from Caucasian and racially mixed populations tended to perform better in higher dose group (>4.5 mg/day), and algorithms from Asian populations performed better in intermediate dose group (1.5–4.5 mg/day). None of the algorithms performed well in lower dose group (<1.5 mg/day).

**Conclusions** Our study indicated that none of the eligible pharmacogenetic algorithms could perform the best for all dosing ranges in the present cohort of Chinese patients under warfarin anticoagulation. It may be important to consider the ethnic and clinical specific characteristics when choosing the appropriate algorithm for a local service population. A more refined pharmacogenetic algorithm combining 3 genotypes (CYP2C9, VKORC1 and CYP4F2) and clinical factors with INR response could potentially improve the warfarin dose prediction in Chinese patients.

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**GW23-e1911**

**ADIPOSE-DERIVED STROMAL CELLS AMPLIFY THE ANGIOGENIC SIGNAL VIA VEGF/mTOR/akt PATHWAY IN THE MURINE PERIPHERAL ARTERIAL DISEASE MODEL: AN IN VIVO 3D MULTIMODALITY IMAGING STUDY**

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**Objectives** Adipose-derived stromal cells (ADSCs) transplantation has been demonstrated a promising therapy for peripheral arterial disease (PAD). However, the underlying mechanism of ADSCs' potential efficacy remains uncertain. The current study aimed to investigate the long-term outcome and therapeutic behaviour of engrafted ADSCs in a murine PAD model by multimodality molecular imaging.

**Methods** ADSCs were isolated from C57BL/6 trangenic mice that constitutively express dual-reporter firefly luciferase and green fluorescent protein (Fluc-­"GFP"). PAD model was constructed by unilateral femoral artery ligation. Male syngentic BALB/c nude mice (n=90) were randomised into 3 groups receiving the following: (1) sham-operation+phosphate-buffered saline (PBS); (2) PAD +PBS; (3) PAD+ADSCs (1×10⁷, intramuscular injection). Long-term fate of ADSCs in vivo was monitored by bioluminescence imaging (BLI), and bioluminescence tomography with micro-­CT (BLT/micro-­CT), further validated by immunofluorescence staining. Hindlimb perfusion and angiogenesis were measured by in vivo laser Doppler perfusion imaging (LDFI) and micro-­CT angiography, which were confirmed by vascular casting with scanning electron microscopy (SEM), immunohistochemistry and functional scores. Therapeutic signal pathways and angiogenic cytokines was assessed by Western blot and ELISA.

**Results** A short-lived survival (~5 weeks) of post-transplant ADSCs within the ischaemic hindlimb was longitudinally followed by noninvasive BLI/BLT/micro-­CT, which enabled quantitative 3-dimensional (3D) imaging for the cells’ location and kinetics in vivo. ADSCs could improve the blood perfusion recovery, ambulatory function and prognosis of the ischaemic hindlimb by inducing angiogenesis. ADSCs didn’t incorporate into host microvasculature network, but were associated with an activation of vascular endothelial growth factor (VEGF), VEGF receptor 2 (VEGFR2), the mammalian target of rapamycin (mTOR) and Akt. Inhibition of VEGF, mTOR or Akt could suppress ADSCs-stimulated perfusion restoration.

**Conclusions** In vivo 3D multimodality imaging facilitates tracking the functional survival of transplanted ADSCs in PAD model. ADSCs may amplify the pro-angiogenic signal partly via VEGF/mTOR/Akt pathway and improve hindlimb ischaemia.

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**GW23-e1909**

**SYNERGISTIC ADIPOSE-DERIVED STROMAL CELLS AND SARPOGRELATE RECOVER THE IMPAIRED ANGIOGENESIS AND INFLAMMATION MODULATORY FUNCTION IN AGED HINDLIMB ISCHAEMIA MICE**

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**Objectives** The elderly is susceptible and vulnerable to peripheral arterial disease (PAD) due to higher prevalence, worse prognosis and fewer therapeutic options than the younger. This study aims to investigate the significance and mechanism of combined murine adipose-derived stromal cells (mADSCs) and sarpogrelate treatment for aged hindlimb ischaemia mice.

**Methods** mADSCs (1.0×10⁷) constitutively express enhanced green fluorescent protein or firefly luciferase reporter were engrafted into aged Vegfr2-luc transgenic mice or FVB/N mice with unilateral femoral artery ligation respectively, which further administrated with sarpogrelate. Multimodality noninvasive imaging and histological approaches were employed to monitor mADSCs’ survival and therapeutic efficacy for hindlimb ischaemia restoration. Therapeutic signal targets and cytokines were assessed by Western blot and ELISA.

**Results** The aged Vegfr2-luc mice showed a decreased expression and activation of VEGFR2, and lower level of VEGF and pro/anti-
inflammatory cytokines within ischaemic hindlimb than the younger, resulting in impaired angiogenic capacity and incompensation for ischaemia. Although mADSCs could modulate inflammation-induced angiogenesis and yield pro-angiogenic and anti-apoptotic effect partly via VEGF/VEGFR2/mTOR/STAT3 in vivo, they had abbreviated lives post transplantation. Sarpogrelate treatment together with mADSCs could further upregulate mTOR/STAT3 signal and attenuate pro-inflammatory IL-1beta/TNF-α/IFN-gamma expression, which ultimately facilitated mADSCs’ survival and therapeutic efficacy in vivo. Sarpogrelate also prevented mADSCs from apoptosis over hypoxia/reoxygenation via mTOR/STAT3 in vitro.

Conclusions This study firstly demonstrates the in vivo kinetics of VEGFR2 expression as biomarker for evaluating cell-directed therapeutic angiogenesis in the elderly. mADSCs and sarpogrelate synergistically restore the impaired angiogenesis and inflammation modulatory function in aged hindlimb ischaemia mice, which may translate into promising strategy for the elderly PAD patient.

GW23-e2152

MTHFR C677T AND MTR A2756G POLYMORPHISMS AND THE HOMOCYSTEINE LOWERING EFFICACY OF DIFFERENT DOES OF FOLIC ACID IN HYPERTENSIVE CHINESE ADULTS

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Objective This study aimed to investigate the very long term outcomes of these two types of DES in current practice. However the very long-term outcomes are yet to be known. The retrospective study showed that both Partner and Excel of the sirolimus eluting DES had similar and lower incidence of MACE and stent thrombosis during a 60 months follow up period were compared.

Results After 4 or 8 weeks of treatment, homocysteine concentrations remained higher in the low FA group at week 4. However, compared to subjects with MTHFR 677CC genotype, homocysteine concentrations remained higher in subjects with CT or TT genotype in the low FA group (p<0.05 for either of these genotypes) and TT genotype in the high FA group (p<0.05). Furthermore, subjects with TT genotype showed a greater homocysteine-lowering response than did subjects with CC genotype in the high FA group (mean percent reduction of homocysteine at week 8: CC 10.8% vs TT 22.0%, p=0.005), but not in the low FA group (CC 9.9% vs TT 11.2%, p=0.89).

Conclusions This study demonstrated that MTHFR C677T polymorphism can not only affect homocysteine concentration at baseline and post-FA treatment, but also can modify therapeutic responses to various dosages of FA supplementation.

GW23-e2425

SIROLIMUS: BIODEGRADABLE POLYMER DRUG ELUTING STENT VERSUS PERMANENT POLYMER DRUG ELUTING STENT.

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Objectives The debate has been ongoing ever since the use of second generation drug eluting stents in daily practice. Several large scale randomised trials have been conducted to evaluate the safety and efficacy of the novel DES. The Partner stent (coated with a permanent polymer) and the Excel stent (coated with a biodegradable polymer) are two different types of sirolimus eluting stents made in China. The mid-term and long-term outcomes have both been investigated and confirmed with promising perspectives. However the very long-term outcomes are yet to be known. The aim of this study is to investigate the very long term outcomes of these two types of DES in current practice.

Methods All consecutive patients undergoing PCI with implantation of Partner and/or Excel from January 2006 to December 2010 at the 2nd Affiliated Hospital of Dalian Medical University were included. Patients were classified according to stent types. Clinical and procedural risk factors were collected retrospectively. The frequency of major adverse cardiac events (MACE: a composite of death, myocardial infarction and target vessel revascularisation) and stent thrombosis during a 60 months follow up period were compared.

Results 447 patients were treated with Partner, 536 patients were treated with Excel and 161 patients received both DES. The MACE rates at 60 months follow up were 7.6% in Partner, 6.9% in Excel and 5.59% in the combined group (HR 0.866, 95% CI 0.502 to 2.24, p=0.978). The rates of cardiac death, myocardial infarction and target vessel revascularisation were 2.2%:1.7%:1.2% (HR 1.00, 95% CI 0.138 to 7.34, p=0.542), 2.23%:2.61%:3.1% (HR 1.51, 95% CI 0.248 to 9.27, p=0.414) and 2.68%:1.42%:0.62% (HR 0.327, 95% CI 0.053 to 3.19, p=0.840). The rates of stent thrombosis were 0.44%:1.1%:0.62% (HR 1.01, 95% CI 0.99 to 1.03, p=0.942).

Conclusions The results from this non-randomised, single centred retrospective study showed that both Partner and Excel of the sirolimus eluting DES had similar and lower incidence of MACE and confirms the safety of both DES in the very late outcomes. They can also be safely used in combination.

GW23-e1868

TAP-SSL5 FUNCTIONS AS AN ANTICOAGULANT AND ANTI-INFLAMMATORY PROTEIN TO INHIBIT THROMBOSIS IN RAT AND ATTENUATE ATHEROSCLEROSIS IN APOE-KNOCKOUT MOUSE

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Objective This study aims to inhibit the inflammatory response and thrombosis in atherosclerotic lesions, by using the
staphylococcal superantigen-like protein-5 (SSL5) to inhibit neutrophil activation, and tick anticoagulant peptide (TAP) to inhibit factor Xa (FXa) activation. To achieve this, we made a novel fusion protein TAP-SSL5 and tested its dual anticoagulant and anti-inflammatory properties.

**Methods** We put six flexible amino acids sequence between TAP and SSL5 genes as a linker. The polycistronic fragment was constructed and then subcloned into a pET22b(+) expression vector. The binding ability of TAP-SSL5 to P-selectin glycoprotein ligand-1 (PSGL-1) on leukocytes was verified by flow cytometry. The binding of TAP-SSL5 to PSGL-1 inhibited the adhesion of leukocytes to P-selectin-coated surface. FXa activity was determined by chromogenic substrate assay.

**Results** We have observed that TAP-SSL5 inhibited FXa activity in a concentration-dependent manner and TAP-SSL5 reduced ferric chloride-induced thrombosis in the inferior vena cava of rat. In a high-fat diet induced atherosclerotic model by using ApoE-knockout (ApoE−/−) mouse, male ApoE−/− mice were grouped to receive intraperitoneal treatment with either TAP-SSL5 (3 mg/kg/day), SSL5 (2 mg/kg/day) or vehicle separately. After 12 weeks of the respective treatment, we have observed that TAP-SSL5 reduced the atherosclerotic plaque formation by 48% compared to controls. We also found TAP-SSL5 could down-regulate several kinds of inflammatory cytokine expressions in vascular wall which were detected by mouse inflammatory antibody array.

**Conclusions** TAP-SSL5 fusion protein has promising anti-inflammatory and anti-thrombosis properties, and it acquires the potential for the prevention of atherosclerotic lesion and thrombus formation.

**GW23-e0855**  
**EFFECT OF AMLODIPINE ON THE PHARMACOKINETICS OF TACROLIMUS IN RELATION TO CYP3A5*3 GENETIC POLYMORPHISM IN HEALTHY CHINESE SUBJECTS**

doi:10.1136/heartjnl-2012-302920c.10

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**Objectives** To investigate the effect of amlopidine on the pharmacokinetics of tacrolimus in relation to CYP3A5*3 genetic polymorphism in healthy Chinese subjects.

**Methods**

1. A PCR-RFLP technique was used for CYP3A5*3 genotyping.
2. HPLC-MS/MS methods were applied to determine the tacrolimus whole blood samples.
3. An open, randomised, three-period crossover clinical trial was used to investigate the effect of amlopidine on the pharmacokinetics of tacrolimus in healthy volunteers in relation to different CYP3A5*3 genotypes.

**Results**

1. The oral clearance of tacrolimus in CYP3A5*1/*1 or CYP3A5*1/*3 group was significantly higher than that in CYP3A5*3/*3, the area under the concentration (AUC) of tacrolimus was less than that in the latter.
2. When tacrolimus and amlopidine were coadministered with single dose or multiple dose in CYP3A5*1/*1 or CYP3A5*1/*3 subjects, the AUC of tacrolimus in coadministration group was significantly higher than that in tacrolimus alone group.
3. For CYP3A5*3/*3 subjects, the AUC of tacrolimus plus amlopidine group is significantly lower than that in tacrolimus alone group when the two drugs are administered with multiple-dose, while there was no significant difference in the AUC of tacrolimus between them when the two drugs are administrated with single-dose.

**Conclusions**

1. CYP3A5*3 is an important factor affecting the tacrolimus pharmacokinetics.
2. Among the CYP3A5*1/*1 and CYP3A5*1/*3 subjects, amlopidine raises significantly the whole blood tacrolimus concentration.
3. Among the CYP3A5*3/*3 subjects, amlopidine raises the oral clearance of tacrolimus and decrease the blood tacrolimus concentration.

**GW23-e0666**  
**ADENOSINE AND ATP STRESS OF FRACTIONAL FLOW RESERVE EVALUATION OF CORONARY ARTERY DISEASE**

doi:10.1136/heartjnl-2012-302920c.11

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**Objectives** To compare fractional flow reserve (FFR) obtained during maximal hyperaemia by Intravenous (IV) ATP and adenosine.

**Methods** 23 patients with 25 lesions underwent determination of FFR with both IV adenosine and ATP. Adenosine and ATP was intravenously administered as a continuous infusion at a rate of 140 and 180 µg/kg/min until the lowest FFR was achieved.

**Results** Mean percent stenosis was 71%±5.97% (range 61% to 83%), mean FFR (IV adenosine) was 0.816±0.04 (range 0.75 to 0.89), and mean FFR (IV ATP) was 0.814±0.04 (range 0.75 to 0.89). There was a strong and linear correlation between FFR measured with IV adenosine and ATP (R=0.974, y (FFR by IV adenosine) =0.967×(FFR by IV ATP)+0.029, P<0.001).

**Conclusions** IV ATP is equivalent to IV adenosine for the determination of FFR.

**GW23-e2383**  
**RESEARCH ON RELIABILITY AND VALIDITY OF QUALITY OF LIFE SCALE IN PATIENTS WITH VIRAL MYOCARDITIS**

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**Objectives** To evaluate the reliability and validity of Quality of Life Scale in Patients with Viral Myocarditis (QOL-VMC Scale) after item selection.

**Methods** 100 patients who were diagnosed viral myocarditis and 100 healthy volunteers filled in the QOL-VMC Scale. Methods such as t-test, correlation analysis and multivariate stepwise regression analysis were applied to evaluate the reliability and validity.

**Results** The evaluation showed that the scale had good test-retest reliability, split-half reliability, consistency reliability, content validity and discriminant validity. The overall construct validity basically matched the initial scale idea of designers.

**Conclusions** The QOL-VMC Scale is proved with good reliability and validity, so it can be used as the supplement of clinical indexes to evaluate the therapeutic effect of viral myocarditis.
CIRCULATING CARDIAC-ASSOCIATED MICRORNAS AS NOVEL BIOMARKERS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

GW23-e0460

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Objectives Recent studies have shown that circulating microRNAs (miRNAs) might be useful novel biomarkers for the diagnosis of acute myocardial infarction (AMI). The aim of this study was to evaluate the expression of cardiac-specific miRNAs (miR-1, -133a, -208b, and -499) in AMI and compare their diagnostic values with that of cardiac troponin T (cTnT).

Methods Sixty-seven plasma samples obtained from patients with AMI and thirty-two plasma specimens collected from healthy volunteers were analysed in this study. The levels of cardiac-specific miRNAs (miR-1, -133a, -208b, and -499) were measured by quantitative reverse transcription-PCR (qRT-PCR), and the concentrations of plasma cTnT were measured using electrochemiluminescence-based methods on the Elecsys 2010 Immunoassay Analyzer.

Results The levels of plasma miR-1, -133a, -208b, and -499 were significantly increased in AMI patients (p<0.001) compared with healthy volunteers. The expression of the cardiac-specific miRNAs in AMI patients decreased to close to the baseline at the time of hospital discharge (p>0.05). There was no correlation between the levels of the four circulating miRNAs and the clinical characteristics of the study population (p>0.05). Furthermore, receiver operating characteristic (ROC) curve analyses showed that the four plasma miRNAs were not superior to cTnT for the diagnosis of AMI.

Conclusions Our results demonstrated that the circulating miRNAs miR-1, -133a, -208b, and -499 may be useful biomarkers for AMI but are not superior to cTnT for the diagnosis of AMI.

DIAGNOSTIC MODE FOR EARLY DIAGNOSIS OF ACUTE AORTIC DISSECTION

GW23-e2022

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Objectives To investigate the clinical manifestations, laboratory tests, imaging characteristics of acute aortic dissection (AD) patients, looking for a simple diagnostic mode for early accurate diagnosis of AD.

Methods 156 cases of acute AD patients hospitalised in the hospital January 2005 to December 2011 were collected, clinical manifestations, laboratory tests, imaging data were analysed to explore the diagnostic mode for the early diagnosis of AD.

Results According to the logistic regression equations and clinical practice to establish scoring models for the early diagnosis of AD. Score 5, predicts that the sensitivity of AD was 98.2%, specificity of 83.4%.

Conclusions A diagnostic mode Containing sudden severe pain of abdominal, chest and (or) back, abnormal elevation of blood pressure, the blood pressure and (or) pulse inconsistent both sides, chest radiograph for aortic shadow and (or) mediastinal shadow widening, significantly higher D-dimer may significantly improve the early diagnosis of acute AD.

EVALUATION ON RESPONSIBILITY OF QUALITY OF LIFE SCALE IN PATIENTS WITH VIRAL MYOCARDITIS

GW23-e2239

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Objectives To evaluate the responsibility of Quality of Life Scale in Patients with Viral Myocarditis (QOL-VMC Scale).

Methods Fifty patients who were diagnosed viral myocarditis filled in the QOL-VMC Scale before and after treatment. The responsibility of QOL-VMC Scale was evaluated from both the change of QOL-VMC Scale score and the effect size.

Results After treatment the score of the physiological, psychological and social dimensions and the total score of the scale were all higher than before treatment, and the differences were significant (p<0.01). The effect size of the physiological dimension, social dimension and total scale were between 0.52 and 0.65, while the effect size of the psychological dimension was 0.57.

Conclusions QOL-VMC Scale is proved with good responsibility, so it can be used to evaluate the therapeutic effect of viral myocarditis.

LONG-TERM ENHANCED EXTERNAL COUNTERPULSATION DOWNREGULATES THE MIF EXPRESSION OF VASCULAR ENDOTHELIAL CELLS IN Atherosclerotic Pigs

GW23-e2547

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Objectives Mechanisms underlying the beneficial effect of Enhanced External Counterpulsation (EECP) in atherosclerotic diseases are not well defined. Since Migration Inhibitory Factor (MIF), as a novel pro-inflammatory and immuno-regulatory factor, has recently been believed to play a pivotal role in the pathogenesis of atherosclerosis, we hypothesised that long-term EECP could downregulate the expression of MIF in vascular endothelial cells (VECs) of atherosclerotic lesions, contributing to its clinical outcomes. We studied this hypothesis in a porcine model of atherosclerosis.

Methods Eighteen 20-day-old male domestic pigs were randomly assigned into three groups: the normal control group (normal group, n=6), the hypercholesterolemic control group (HC group, n=6) and the hypercholesterolemic+EECP group (EECP group, n=6). Pigs in normal group were fed with normal diet, while the pigs in the other two groups were fed with cholesterol-rich diet in order to induce atherosclerosis. Six pigs in EECP group were anesthetised by intramuscular injection of 846 mixture and intravenous infusion of pentobarbital sodium. The EECP procedures were performed on them for 2 h every 2 days with 0.035 MPA/cm² pressure, summed total 36 h. After the end of EECP, all the pigs were sacrificed by injecting overdose of 10% potassium chloride into the heart. For each animal, the thoracic aorta was isolated for histological and immunohistochemical staining.

Conclusions Since Migration Inhibitory Factor (MIF) can regulate the expression of MIF in vascular endothelial cells (VECs) of atherosclerotic lesions, contributing to its clinical outcomes. We studied this hypothesis in a porcine model of atherosclerosis.

Results The staining-positive rate of MIF of aortic VECs in EECP group was much lower than that in HC group ((211±14)‰ vs (358±26)‰, p<0.05), but still higher than that in normal group.
significantly ((211±14)% vs (168±22)‰, p<0.05). In consistence with the result of immunochemical staining analysis, the relative ratio of RT-PCR products of MIF were lower in EECF group than that in HC group ((1.26±0.15) vs (1.99±0.22), p<0.05), but still higher than that in normal group significantly ((1.26±0.15) vs (0.65±0.11), p<0.05). The immunochemical expression of MIF correlated positively to its relative ratio of RT-PCR products (r=0.662, p<0.05).

Conclusions MIF in VECs may play an important role in atherogenesis. Transcriptional down regulation of MIF in VECs may be one of the molecular mechanisms contributing to the clinical outcomes following EECF performation.

**GW23-e1392** CORONARY HEART DISEASE OF SYNDROME OF BLOOD STASIS AND DEFICIENCY OF BOTH VITAL ENERGY AND YIN THERAPY WITH PRESCRIPTION-SYNDROME CORRESPONDING: A RANDOMISED CONTROLLED TRIAL

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**Objectives**

**Results** Compared coronary heart disease with two groups, syndrome of blood stasis (SBS) and deficiency of both vital energy and yin (DEY), and observed the effects of treated by prescription-syndrome corresponding or not.

A randomised, double-blinded, and placebo-controlled trial was applied. Eighty-eight patients, diagnosed as UA, were enrolled and equally randomised into two groups, SBS and DEY groups, treated with Shengmai Capsule (血府逐瘀胶囊, SM), or Xuefu Zhuyu Capsule (血府逐瘀胶囊, XFZY) on SBS group, DEY group, by prescription-syndrome corresponding or not, and administered with the corresponding medications respectively for 4 weeks. The clinical symptoms, and its scores were recorded and compared among groups during and after the treatment. High sensitive reactive protein (hs-CRP), platelet aggregation (ADP), homocystic acid (Hcy), matrix metalloproteinase-9 (MMP9), α-natriuretic peptide (BNP), platelet activating factor (PAF), myeloperoxidase (MPO), endothelin (ET) were examined in groups before and after the treatment.

Eighty-two patients completed the whole study. After the treatment, the total effective rates of the prescription-syndrome corresponding groups in ameliorating symptoms and signs, respectively, which were more obvious in XFZY on SBS group, and SM on DEY group than those of prescription-syndrome uncorresponding group. Also in the prescription-syndrome corresponding groups, chest distress, palpitation, short breath, spontaneous perspiration amendment significantly than those of prescription-syndrome uncorresponding groups. Before and after therapy, the serum markers, all have significantly decreased in XFZY on SBS group, only hs-CRP, Hcy, MPO have significantly decreased in SM on DEY group; in prescription-syndrome uncorresponding groups, there have no significantly changes in SBS group, and hs-CRP, Hcy, MPO, MMP9 have statistical significance in DEY group. After therapy, only in SBS group, there have statistical significance in prescription-syndrome corresponding or uncorresponding groups.

**Conclusions** Our CAD angina prescription-syndrome corresponding trial identified the on the basis of modern medical therapy, the differentiation of syndrome of CTM showed its distinct effect. Prescription-syndrome corresponding can improve the diagnostic of coronary heart disease, and decreased serum inflammation markers in XFZY on SBS group, parts of those decreased in SM on DEY group, which independent to that of modern medical therapy.
reduce salt (OR=0.85, 95% CI 0.77 to 0.95 for urban; OR=0.78, 95% CI 0.69 to 0.89 for rural) and to take action to reduce salt (OR=0.91, 95% CI 0.79 to 1.04 for urban; OR=0.89, 95% CI 0.81 to 0.98 for rural). TV/radio was the most frequently reported source of information on salt and health (60.5% for urban; 54.9% for rural), doctors stood next in the line (29.4% for urban; 23.1% for rural).

Conclusions The majority of Shandong residents recognise the health consequences of high-sodium diet and are interested in reducing their sodium intake. Expanded educational efforts are needed to broaden awareness of the health impact of a high-sodium diet, and address misperception of low sodium diet. Salt media campaign should be considered to achieve desirable salt consumption. The findings of this study suggest that socio-economic status (education and income) should be considered during the development of strategies for effective public education campaign.

**ABSTRACTS**

**GW23-e1751** AWARENESS, TREATMENT, AND CONTROL OF HYPERTENSION IN CHINA: FINDINGS FROM 2010 CHINA CHRONIC DISEASE AND RISK FACTOR SURVEILLANCE

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Objectives We aimed to examine the awareness, treatment, and control of hypertension in Chinese adults and to explore their difference among subpopulations.

Methods The 2010 China Chronic Disease and Risk Factor Surveillance was carried out from August to November 2010 nationwide in mainland China. A total of 98,548 respondents sampled by multistage clustering sampling design were included in the analyses. All respondents had their blood pressure (BP) measured 3 times successively by using unified electronic BP monitor. The average of last 2 measures was used for analyses. Information on history and treatment of hypertension was collected by questionnaire-based interview. The awareness, treatment, and control of hypertension were examined by age, sex, rural/urban residency and geographical regions. For comparisons of percentages between subgroups, Rao-Scott $\chi^2$ test was used. Logistic regression was used to test trend over age. Taylor series linearisation was applied to estimate CIs. All calculations were carried out with complex weights in SAS V9.3.

Results Overall, of individuals with hypertension, 35.5% were aware of their condition, which was much higher than the estimate (24%) from 2002 China National Nutrition and Health Survey (CNNHS). More women (39.1, 95% CI 37.3% to 40.9%) were aware of their hypertensive status than were men (32.8, 95% CI 31.0% to 34.6%, $P<0.01$). Awareness of hypertension increased with age ($p$ for trend $<0.01$). Urban residents with hypertension (41.1%, 95% CI 38.4% to 43.7%) had a higher percentage of being aware their condition than did rural residents (33.2, 95% CI 31.1% to 35.4%, $P<0.01$). Awareness of hypertension decreased from 38.4% (95% CI 35.7% to 41.1%) in east, 35.3% in middle (95% CI 32.2% to 38.4%), to 31.6% in west region of China (95% CI 28.2% to 34.5%, $p$ for difference $<0.05$).

Four in five (80.4%, 95% CI 79.0% to 81.9%) received prescribed antihypertensive medications, but only 15.5% (95% CI 17.0% to 20.0%) had their BP controlled among individuals who were aware of their hypertension. The treatment and control of hypertension were quite similar to those reported by 2002 CNNHS (78% and 19%, respectively). Antihypertensive treatment was more common in women (84.9%, 95% CI 83.4% to 86.3%) than in men (75.8%, 95% CI 73.9% to 77.7%, $P<0.01$), and increased with age ($P$ for trend $<0.01$). Neither the proportions of treated individuals varied by rural/urban residency (80.8% vs 80.2%, $p=0.72$), nor differed among geographical regions (80.3% for east, 82.1% for middle, and 78.1% for west, $P$ for difference=0.11). As opposed to treatment, the percentages of controlled BP decreased with age ($P$ for trend $<0.01$). No significant difference of BP control existed between men (19.1%, 95% CI 17.3% to 21.0%) and women (17.9%, 95% CI 16.2% to 19.6%, $p=0.17$). A strong rural-urban disparity of BP control was observed: 15.3% (95% CI 13.6% to 17.0%) in rural areas and 23.9% (95% CI 21.0% to 26.7%) in urban areas ($P<0.01$). Similar control of BP were found among geographical regions (19.5% for east, 16.8% for middle, and 18.9% for west region, $P=0.28$).

Conclusions Awareness of hypertension in Chinese adults with hypertensive condition had increased greatly since 2002, but was far from enough. Adequate control of blood pressure remained at a quit low level in this decade despite treatment was as high as more than 80%. Improving awareness in a wider population and enhancing efficacy of treatment should still be the very focus of national hypertension programs.

**GW23-e2684** PREVALENCE OF CARDIOVASCULAR DISEASE RISK FACTORS IN CHINA: FINDINGS FROM 2010 CHINA CHRONIC DISEASE AND RISK FACTOR SURVEILLANCE

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Objectives To examine the up-to-date prevalence of cardiovascular disease risk factors in Chinese adult population in 2010.

Methods Overview of the surveillance and sample design

The 2010 China Chronic Disease and Risk Factor Surveillance (CCDRFS) selected participants by using a multi-stage stratified cluster sampling method from National Disease Surveillance Points system which covers 31 provinces, autonomous regions or municipalities in mainland China. A total of 98 712 interviews were completed.

The 2010 CCDRFS was conducted using centralised interviews and physical measurements (ie, gathering participants in certain locations). The contents of the 2010 CCDRFS included face-to-face questionnaire interviews, physical measurements, and laboratory tests. The contents of face to face interview included household information on dietary habits, economy status and individual information on tobacco use, alcohol consumption, diet, physical activity, self-reported chronic diseases, self-rated health status, etc. Physical measurements included height, weight, hip circumference and blood pressure. Laboratory tests included fasting and 2 h oral glucose tolerance test (OGTT-2h) blood glucose, insulin, blood lipids, and HbA1c.

A three-level quality control network (national, provincial and county) was carried out and a national quality control protocol was developed to ensure the quality. Fasting and OGTT-2h blood glucose were performed in county level laboratories. Each laboratory was required to pass performance test for blood sugar measurements quality controls.

Statistical analysis

We estimated weighted prevalence of behavioural risk factors such as current tobacco smoking, overconsumption of alcohol...
drinking, insufficient physical activity, unhealthy diet, and other risk factors such as overweight and obesity, hypertension, and dyslipidemia by age groups (18–44, 45–59, 60+), sex, rural/urban according to county level administrative unit and east, middle, west regions according to provincial-level geographical distribution.

In this study, all estimated prevalence was weighted considering complex sampling weight. All computation was conducted in SAS 9.3.

**Results** Tobacco use In 2010, the estimated self-reported prevalence of current smoking among Chinese residents aged 18 years and older was 28.8%. Smoking behaviour is much higher in male (53.3%) than in female (2.5%). Among male residents, current smoking prevalence was 52.5% in urban areas and 53.6% in rural regions (54.2%) than in rural area (53.3%) and rural area (52.8%), middle (53.0%) and west (54.2%) regions within China.

Alcohol overconsumption

There was 8.1% adults report hazardous drinking (consuming ethanol ≥41.0 g per day and <61.0 g per day for men, ≥21.0 g per day and <41.0 g per day for women) among those who drank. It was higher in male (9.3%) than in female (3.2%), higher in rural area (8.5%) than in urban area (7.4%). A decreasing trend was found from east, middle to west regions (8.4%, 8.3%, and 7.5%, respectively).

Insufficient vegetable and fruit intake

In 2010, insufficient intake of fruit and vegetable among residents aged 18 and older was 52.8% with a similar level between men and women (53.8% and 51.7%, respectively). Insufficient intake of fruit and vegetable was most common among residents aged 60 and older than younger age groups, more common among in rural residents (55.7%) than urban (46.2%), and similar across regions (51.3% in east, 54.6% in middle and 52.6% in west region).

Physical activity

In 2010, 1.9% of the adults reported regular physical exercise performance. Regular exercise was more common in urban (19.9%) than in rural areas (8.2%), and more common in men (13.1%) than women (10.6%). The proportion of residents who reported never have physical exercise during the last 12 months was 83.8%, which was more common in rural than in urban areas (88.6% vs 78.2%) and more like among women than men (86.2% vs 81.6%).

Overall, the average amount of leisure time sedentary behaviour was 2.7 h. Men had more sedentary behaviour time (2.9 h) than women (2.6 h), and urban residents had more areas (3.3 h) than rural residents (2.5 h). Sedentary behaviour time decreased with increasing age.

Overweight and obesity

In 2010, the prevalence of overweight and obesity (BMI cutoff points: 24.0–27.9 for overweight, ≥28 for obesity) were 30.6% and 12.0%, respectively. Higher proportion of overweight and obesity was found in urban area than in rural area with a similar level between men and women. 32.3% and 12.5% of participants aged 60 years and above was found being overweight and obesity. Obesity was the most serious in women aged 44–59 (17.8%).

According to the WHO criteria (BMI cutoff points: 25.0–29.9 for overweight, ≥30 for obesity), overweight and obesity was found 27.9% and 5.1%, respectively.

Raised blood pressure

The prevalence of raised blood pressure in Chinese adults was 38.5%. The prevalence increased with age, with highest among residents aged 60+ years and lowest among individuals aged 18–44 years. The prevalence is higher among males (35.1%) than females (31.8%). Residents suffered similar situation in urban (34.7%) and rural area (32.9%). Prevalence in east, middle, and west region of China were 36.2%, 34.1%, and 28.8%, respectively.

Dyslipidemia

In 2010, 3.3% had high total cholesterol (TC) (men 3.4% and women 3.2%; urban 4.2% and rural 2.9%). Of those 60 years and older, 4.9% had high TC.

The prevalence of low blood high-density lipoprotein cholesterol (LDL-C) was 2.1%, with the same figures for both genders. Low blood LDL-C were found among 3.0% urban residents 1.8% rural residents and were 2.9%, 1.5%, and 1.8% for the east, middle, and west regions respectively. With increasing age, the prevalence of low blood LDL-C increased first among younger groups and then declined in older groups.

High triglycerides were found among 11.5% of Chinese adults (men 15.8%, women 8.6%; urban residents 12.1% and rural residents; 10.9%, 11.0%, 11.7%, and 11.2% for the east, middle, and west region). The prevalence of high triglyceride among women increased with age, whereas among men, it increased among younger age groups then declined among older age groups.

**Conclusions** Risk factors of cardiovascular disease are prevailing among Chinese adults.
presumed that plasma concentrations of miR-195, miR-30a and let-7b may serve as biomarkers for identifying acute myocardial infarction (AMI) in humans.

Methods Plasma samples from 18 patients with AMI and 30 healthy adults were collected. Total RNA were extracted from plasma with TRizol LS Reagent. MiRNA productions were quantified by quantitative real-time PCR and plasma cardiac troponin I (cTnI) concentrations were measured by ELISA assay. Our study showed that circulating miR-30a was highly expressed at 4 h, 8 h and 12 h in patients with AMI, and miR-195 is highly expressed at 8 h and 12 h. However, let-7b was lower in AMI patients than in the control group at 4 h, 8 h, 12 h, 24 h, 48 h, 72 h and 1w. MiR-30a, miR-195, let-7b and cTnI exhibited the same trench.

Results The plasma concentration of miR-195, miR-30a and let-7b can be a potential indicator of AMI. Our results implied that profiling of circulating miRNAs may help identify patients in AMI.

Conclusions In this study, we reported the expression of circulating miR-30a, miR-195 and let-7b in human AMI, in comparison to the healthy adult. Interestingly, miR-30a plasma levels in patients with AMI up-regulated at 4 h, 8 h and 12 h; and miR-195 up-regulated at 8 h and 12 h after the onset of AMI symptoms. Meanwhile, let-7b was down-regulated in AMI at 4 h, 8 h, 12 h, 24 h, 48 h, 72 h and 1w after the onset of AMI symptoms. Importantly, an outstanding finding in this study is that miR-30a, miR-195, let-7b and cTnI exhibited the same trench, but with no significant interaction effects. The plasma concentration of miR-30a, miR-195 and let-7b show a good correlation with the plasma concentration of cTnI, a classic marker of myocardial injury. Using the levels of the three miRNAs, we can define a score with a high specificity and sensitivity for the detection of AMI patients at 8 h and 12 h relative to healthy adult. Thus, our results clearly hold out the hypothesis that miR-30a, miR-195 and let-7b may useful for identifying the AMI.

GW23-e1394 THE TREND AND VARIATION OF CARDIOVASCULAR DISEASE MORTALITY FROM YEAR OF 2004 TO 2010 IN CHINA doi:10.1136/heartjnl-2012-302920d.6
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Objectives to report the epidemic status, trend and variation of cardiovascular disease (CVD) mortality from year of 2004 to 2010 in China.

Methods The mortality data album of population-based survey, 2004 and 2008 from National Disease Surveillance System are taken. This surveillance system is consisted by 161 disease surveillance points (DSPs) spreading in the 31 provinces of China; among them, 64 DSPs are in urban, 97 DSPs are in Rural. The area is divided into three regions: East, Central and West, geographically. The total population of surveillance is over 73 millions and it takes 6% around of the whole population, China. Cardiovascular disease included ischaemic heart Diseases (ICD10: 105-109, 111, 120-127, 130-152) and cerebra-vascular disease (ICD-10: 160-169). The epidemic status and trend of cardiovascular disease (CVD), cerebra-vascular disease (CD) and ischaemic heart disease (IHD) in mortalities from 2004 to 2008 are described by age, gender, urban/rural and region.

Results The mortality of CVD increased from 223.50/100 000 to 259.47/100 000 (+15.48/100 000 rise) in total, 229.06/100 000 to 217.50/100 000 (−11.56/100 000 fall) in urban, and 220.63/100 000 to 252.26/100 000 (+32.18/100 000 rise) in rural. The similar trends were found in males and females among the total populations, urban populations and rural populations. However, the survey results showed that CD mortality decreased in urban and increased in rural. For example, the CD mortality rate fell from 134.76/100.000 in 2004 to 131.58/100 000 (−3.18/100 000 fall) in 2010 in entire population, and 129.44/100 000 to 107.94/100 000 in urban (−21.5/100 000 fall), and rose from 137.44/100 000 to 145.97/100 000 (+8.53/100 000 rise) in rural. IHD mortality rates from 2004 to 2010 increased from 66.05/100 000 to 81.53 (+15.48/100 000 rise) in entire population, 75.41/100 000 to 85.46/100 000 (+10.05/100 000 rise) in urban, 61.32/100 000 to 79.69/100 000 (+18.37/100 000 rise) in rural. No mater what CD or IHD, the mortality rates are dramatically more increase in rural populations than urban populations. The similar variation and trend were found in males and females among entire, urban and rural populations. The age-standardised mortality rates and variations of CVD, CD and IHD showed the similar trend as true crude mortality rates in 2004 and 2010. The surveillance results also demonstrated that the rates of CVD mortality increased from 223.5/100.000 in 2004 to 230.24/100 000 in 2005, then turned down to the lowest point at 54.91/100 000 in 2006, then rose again continually year by year until reached the highest rate of 81.53/100 000 in 2010. There are similar trends and variations for CD and IHD both in crude mortality rates and age-standardised mortality rates among males and females. However, it is worthwhile to notice that the mortality rates for CVD, CD and IHD among rural populations increased so faster, even exceeded the rates of urban populations. For example, for CD, the rate in rural exceeded it in urban after year of 2006 among all, males and females; for IHD, the rate in rural continued to rise and were close to the rate in urban in year 2010 among all, males and females.

Conclusions The mortality of CVD, CD and IHD from 2004 to 2010 continued to increase except year of 2006 although there were waves between year 2004 and 2006. The age-standardised mortality rates of CVD, CD and IHD showed the similar trend and variations both for males and females. But the sharp faster speed of mortality rates in CVD, CD and IHD were from rural populations. More and more usage of advanced new medical techniques or devices, medication and medical services would decrease CVD mortality and increase CVD prevalence, particularly in urban area. Meanwhile, increase of CVD mortality would be explained by additional results of behaviour and risk factor survey for non-communicable and chronic disease in China—high levels or high rates of CVD risk factors, unhealthy lifestyle and behaviours besides the availability of accessing health care in the advanced medical therapies and techniques, especially for rural populations. The implementation should be strengthened and taken more at the CVD primary prevention level besides the aspect of CVD secondary prevention level, particularly in rural areas.
were recruited from 6 villages in Tianjin, China. We compared the differences of blood pressure distribution by age and gender.

**Results** Overall, the mean SBP was 140.97 mm Hg, 141.23 mm Hg of men, 140.95 mm Hg of women, and there was not significant difference (p=0.781). The total mean DBP was 86.63 mm Hg, 87.85 mm Hg of men, 85.87 mm Hg of women, DBP in men was more than in women, p = 0.001. The results indicated that the mean of SBP increased with age (p < 0.001), 131.40 mm Hg in aged 35–44 years, 138.41 mm Hg in aged 45–54 years, 144.49 mm Hg in aged 55–64 years, and 150.16 mm Hg in aged 65–74 years, respectively. However, the mean of DBP, 85.26 mm Hg in aged 35–44 years, 77.67 mm Hg in aged 45–54 years, 77.17 mm Hg in aged 55–64 years, and 84.66 mm Hg in aged 65–74 years, respectively, greater occurring in aged 45–54 years and 55–64 years. Both SBP and DBP, the means in men were greater than in women, p < 0.05. The categories of blood pressure distribution presented that 8.93% individuals with optimal BP (SBP<120 mm Hg, and DBP<80 mm Hg), 23.60% with normal BP (120 mm Hg ≤ SBP<140 mm Hg, and 80 mm Hg ≤ DBP<90 mm Hg), 16.66% with prehypertensive (150 mm Hg ≤ SBP<160 mm Hg, and 85 mm Hg ≤ DBP<90 mm Hg), 25.73% with stage I hypertensive (140 mm Hg ≤ SBP<160 mm Hg, and/or 90 mm Hg ≤ DBP<100 mm Hg), 16.65% with stage II hypertensive (160 mm Hg ≤ SBP≤180 mm Hg, and/or 100 mm Hg ≤ DBP≤110 mm Hg), 8.41% with stage III hypertensive (SBP>180 mm Hg, and/or DBP>110 mm Hg). All categories were 5.94%, 20.62%, 17.91%, 25.22%, 17.98%, and 9.70% in men, respectively; 10.88%, 24.08%, 15.77%, 25.92%, 15.67%, and 7.72% in women, respectively. The proportion of individuals with optical and normal in men and aged 65–74 years were lower than in women and aged 35–44 years, p < 0.05. The individuals with stage I, II, and III hypertensive appeared rising with age. The characteristics of BP distribution in men aged 65–74 years were different from women with same age group, had lower percentage of normal BP (6.2%), and higher percentage of stage I, II hypertensive (31.78%, and 25.58% respectively) than women.

**Conclusions** The mean BP among rural residents aged 35–74 years are the highest in Tianjin, China, 141 mm Hg of SBP and 87 mm Hg of DBP. Especially, the mean SBP and DBP in men aged 35–44 years are greater than in women aged 35–44 years. More than half of the residents appear hypertensive. Thus, we predict that the incidence of stroke and cardiovascular diseases would increase in future, China. The top priority is to shift improvement of hypertension to young men in rural. It is important to prevent cardiovascular and cerebrovascular diseases in China.

**GW23-e0874** IMPACT OF OBESITY ON OUTCOMES OF CHINESE PATIENTS WITH ST-SEGMENT MYOCARDIAL INFARCTION HAVING URGENT PERCUTANEOUS CORONARY INTERVENTION
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**Objectives** The study analysed the impact of obesity on outcomes of Chinese patients with ST-segment myocardial infarction (STEMI) having urgent percutaneous coronary intervention (PCI). 241 patients with STEMI having urgent PCI who were admitted to the 20 hospitals in LiaoNing region from 2009 until 2010 were enrolled. Patients were stratified according to Body Mass Index (BMI) as normal weight (18.5 kg/m²≤BMI <24.0 kg/m², n=149), overweight (24.0 kg/m²≤BMI <28.0 kg/m², n=196), or obese (BMI≥28.0 kg/m², n=76). At follow-up the main adverse cardiac cerebrovascular events (MACCE, including cardiac death, non-fatal myocardial infarction, revascularisation and stroke) and readmission for cardiovascular events were assessed. Survival curves were performed using the Kaplan–Meier method with the log-rank test. The association between obesity and clinical outcomes was future examined using univariate and multivariate Cox proportional hazard models.

**Results** The mean duration of follow-up was 367.34±109.00 days. Obesity was associated with younger age (p<0.001), a higher prevalence of male (p<0.001), hypertension and hyperlipidaemia (both p=0.001), the higher levels of low density lipoprotein (p=0.01), cholesterol (p=0.001) and triglycerides (p<0.001). PCI characteristics and treatments were similar across BMI category. At follow-up, MACCE/readmission for cardiovascular events free survival rate was not significantly different among three groups; after adjustment confounders, obese was the independent risk factor for cardiac death (p=0.04), and non-fatal myocardial infarction (p=0.04).

**Conclusions** Patients with obesity present with STEMI having urgent PCI have the MACCE/readmission for cardiovascular events free survival rate similarities to normal weight and overweight counterparts at follow-up. Obesity was independently associated with the higher incidence of the cardiac death and non-fatal myocardial infarction. The ‘obesity paradox’ was not observed in outcomes.

**GW23-e0901** A STUDY OF GENE-GENE INTERACTION OF MHC2TA, VAMP8 AND HSP70-2 POLYMORPHISM WITH CORONARY HEART DISEASE
doi:10.1136/heartjnl-2012-302920d.9

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**Objectives** To investigate the impact of Gene—gene interaction of MHC2TA-166A/G, VAMP8(rs1010), HSP70-2+1267A/G on the risk of coronary heart disease.

**Methods** A total of 185 coronary heart disease patients (male120, female 65, median age 64.57±10.94) were selected from Cardiovascular department of our hospital, Of these CHD patients 119 are myocardial infarction, others are angina pectoris patients. The control group is consisted of 149 subjects (male 96, female 53, median age 63.82–49.01), Human genome DNA was extracted by DNA extraction kit. The heat-shock protein 70-2 gene+1267A/G polymorphism, the vesicle-associated membrane protein 8 gene (rs1010) polymorphism were all detected by PCR-fragment length polymorphism (PCR-RFLP) method. Major histocompatibility complex class II transactivator gene-166A/G polymorphism was all detected by misparing PCR-restriction fragment length polymorphism (mpPCR-RFLP) method. A multi-factor dimensionality reduction analysis was carried out for interaction of genes by opening free MDR Software.

**Results** The MHC2TA gene-166A/G polymorphism, VAMP8 gene (rs1010) polymorphism and HSP70-2+1267A/G polymorphism also exist in this study population. The allelic distribution of the MHC2TA gene, the VAMP8 gene and the HSP70-2 gene in both CHD and control groups were in the Hardy-Weinberg equilibrium. The Interaction of MHC2TA-166A/G, VAMP8(rs1010) HSP70-2+1267A/G genetic polymorphisms was observed using Multifactor Dimensionality Reduction Analysis, OR of three genetic polymorphisms simultaneously was 5.21 times more than MHC2TA alone.

**Conclusions** The gene-gene interaction was observed among the polymorphism of MHC2TA-166A/G, VAMP8 (rs1010) and HSP70-2+1267A/G, three genetic polymorphisms simultaneously may increase the risk of coronary heart disease obviously.
OBJECTIVES

To compare the global risk of cardiovascular disease (CVD) under the different socio-economic status (SES).

METHODS

This study is cross-sectional research; parts of 'China National Survey for Determinants of Detection and Treatment Status of Hypertensive Patients with Multiple Cardiovascular Risk Factors, CONSIDER'. A total of 5206 hypertension patients from 46 hospitals across seven regions of China were recruited from June to December 2010. A cluster sampling of 100 to 200 consecutively hypertension patients who visited the outpatient department and met the entry criteria of this study was selected in each hospital. The information was collected by a questionnaire survey (the history of diseases, lifestyles, complications of hypertension and other cardiovascular risk factors), physical examination and also the laboratory tests for each of the patients. This study included 4985 patients who had complete data.

The global risk of CVD was calculated according to the criteria of Chinese Guidelines for Prevention and Management of Hypertension issued in 2005. And all of patients were assigned to four groups: low risk, medium risk, high risk and very high risk by the degree of risk.

On the basis of Weber’s definition of SES and the situation in our transformation period, we included education, occupation, annual income and types of medical insurance and created a SES score. Using principal component analysis, we divided the patients in accordance with the quartile of SES score (0.70, -0.01, 0.78) into four groups: lower, lower-middle, upper-middle and upper.

RESULTS

There were remarkable differences in the prevalences of other CVD risk factors among hypertension patients of different SES levels. The proportion of global risk of CVD, which is granted from lowest to highest, is 2.0%, 30%, 51.4%, 36.6% in the hypertensive patients with the lower SES; 2.2%, 27.7%, 35.6%, 34.5% in the hypertensive patients with the lower-middle SES; 2.6%, 32.5%, 35.1%, 29.8% in the hypertensive patients with the upper-middle SES; and 3.0%, 34.7%, 56.2%, 26.1% in the hypertensive patients with the upper SES. Ordinal logistic regression analysis showed that, SES was independently associated with the global risk of CVD. Compared with those in the patients with the upper SES, the global risk of CVD is increased 107% in the patients with the lower SES, after adjusted by other confounding factors.

CONCLUSIONS

Hypertension out-patients with poor socio-economic status had more cardiovascular risk factors and higher global risk of CVD. It is suggested that appropriate policy support should be made for vulnerable patients. To improve their medical insurance reimbursement rate and reduce the gap of SES will help them to lower the global risk of CVD.

ARTERIAL STIFFNESS EVALUATION BY PULSE WAVE VELOCITY AND ITS RELATED FACTORS ANALYSIS IN SHOUGANG CORPORATION WORKERS OF CHINA

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OBJECTIVES

Arterial stiffness is one of the earliest detectable manifestations of adverse structural and functional changes within the vessel wall. And it can be measured by pulse wave velocity (PWV), which is considered as the gold standard method suggested by European Society of Hypertension/European Society of Cardiology guidelines. In the present study, we investigated the possible risk factors involving PWV in health people.

METHODS

628 cases (age: 45.0±12.3 years, male: 283) workers from Shougang Corporation were enrolled into our study. PWV was measured by Complior apparatus. Multivariate analysis was performed to detect independent predictors of PWV among age, body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), coronary artery disease (CHD), hypertension, diabetes mellitus (DM) and hyperlipidaemia.

RESULTS

The incidences of CHD, hypertension, DM, hyperlipidaemia were 4.9%, 7.5%, 3.7%, 6.2% in the entire group. However the prevalence of CHD, hypertension, DM, hyperlipidaemia were higher in workers with PWV>9 m/s than in PWV<9 m/s group (6.8% vs 2.0%, 16.7% vs 2.0%, 5.0% vs 0.5%, 7.8% vs 2.9%, all p<0.05). PWV was positively correlated with age, BMI, carotid-ankle vascular index (CAVI), SBP, DBP and HbA1c in all subjects (r=0.695, 0.376, 0.620, 0.541, 0.491, 0.229, respectively, all p<0.001). The value of PWV was higher in male group than that of female group (10.66±1.60 vs 9.15±1.44 m/s, p<0.001). Multivariate analysis showed that age, SBP and DBP were significant independent predictors of PWV in all subjects. However the independent predictors of PWV were different in male and female groups (age and SBP in male; age, DBP and DM in female, respectively). Finally, we also found that the predictors of PWV were different in different age groups.

CONCLUSIONS

The incidence of vascular disease was growing with the increasing of arterial stiffness. PWV was a reliable evaluation index of arterial stiffness. The related factors of PWV were different in different gender and age groups. So our research might provide new precaution according to gender and age in order to prevent vascular diseases.
1181G→C genotype (GG, GC and CC), two alleles (950T, 950C and 1181 G, 1181C) and the 950/1181 chain gene were not significantly different.

3. Compared Carotid plaque-free group with plaque-positive group, there were significant difference in the distribution of 950 T→C genotypes (TT, TC and CC), 1181G→C genotype (GG, GC and CC), two alleles (950T, 950C and 1181 G, 1181C).

And the frequency of 950CC, 1181CC genotype and 950 allele appear in the plaque-positive frequency was significantly higher than the non-plaque control group. The 950/1181 distribution chain gene is also a significant difference, which CC/CC genotype had the largest difference between the two groups.

4. The carotid IMT of patients with 950TT, 950TC and 950CC genotype were respectively 0.90±0.11 mm, 1.08±0.23 mm and 1.20±0.16 mm. And IMT of patients with 950CC genotype were thicker than patients with 950TT genotype (p<0.05); The IMT of patients with three different genotypes on 1181 gene locus (1181GG, GC and CC) also showed with significant differences, which were respectively 0.93±0.12 mm, 1.09±0.16 mm and 1.18±0.13 mm, in which of patients with CC genotype were significantly thicker than GC genotype (p<0.05).

Conclusions The polymorphism of OP gene on 950 locus and 1181 locus were not correlated with hypertension, but correlated with atherosclerosis of carotid artery.

GW23-e0784
GENDER-SPECIFIC IMPACT OF SERUM URIC ACID LEVEL ON REGIONAL ARTERIAL STIFFNESS AND WAVE REFLECTION IN GENERAL CHINESE POPULATION

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Objectives Both increased arterial stiffness and hyperuricaemia are associated with elevated cardiovascular risks. Little is known about the relations of serum uric acid (UA) level to regional arterial stiffness and wave reflection. The aim of the study was to investigate the gender-specific association of serum UA and indices of arterial function in a community-based investigation in China.

Methods Cross-sectional data from 2374 adults (mean age 58.24 years) who underwent routine laboratory tests, regional pulse wave velocity (PWV) and pulse wave analysis measurements were analysed in a gender-specific manner. None of the participants had atherosclerotic cardiovascular disease, chronic renal failure, systemic inflammatory disease, gout, or were under treatment which would affect serum UA level.

Results Mean ages were 58.24±12.38 years for all participants (range 35 to 96 years). Mean serum UA was 295.93±75.52 μmol/l. Men had higher serum UA level than women (326.76 ±72.96 μmol/l vs 263.68±64.4 μmol/l, p<0.001). Subjects with hyperuricaemia had significantly higher carotid-femoral PWV (PWVc-f) in women (12.8±3.32 m/s vs 10.96±2.75 m/s, p<0.001), significantly higher carotid-ankle PWV in both gender (men: 9.85±3.08 m/s vs 9.29±1.64 m/s, p=0.001; women: 9.62±1.91 m/s vs 9.04±1.7 m/s, p=0.003), while marginally lower augmentation index (AIx) in men (log AIx-75, 1.24±0.32% vs 1.3±0.24%, p=0.049). Multiple regression analysis showed that serum UA was an independent determinant only for PWVc-f in women (β=0.104, p=0.027), when adjusted for atherogenic confounders. No other independent relationship was found between UA level and other surrogates of arterial stiffness.

Conclusions Serum UA levels are associated with alterations in systemic arterial stiffness that differ in men and women. Women might be more susceptible to vascular damage associated with hyperuricaemia.

GW23-e1022
A META ANALYSIS ON THE CORRELATION BETWEEN GENE POLYMORPHISM

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Objectives To evaluate the association of gene Polymorphism of inflammatory Cytokines (IL-6-174G/C, ICAM-1K46/E, PECAM-1+125C/G, MHCZTA-168A/G) and Coronary Heart Disease.

Methods The studies according to the correlation between gene Polymorphism of inflammatory cytokines (IL-6-174G/C, ICAM-1E469/K, PECAM-1+125C/G) and the risk for CHD were comprehensively searched. All the related studies were further strictly selected according to the inclusion criteria. Then relevant data were extracted for methodological eligible and heterogeneity analysis. Hierarchies analysis according to the regional distribution. The statistical packages Statal 10.0 and Reman5.0 were applied for investigating heterogeneity among individual studies and summarising overall effects across studies by proper effect mathematical model, calculating the pooled OR and its 95% CI, and testing the overall effects, Egger’s test were performed for evaluating the publication bias. The sensitivity analysis by different effect model and sample size was employed for the reliability of meta-analysis.

Results All the included studies about IL-6-174G/C polymorphism and the association with the Susceptibility of CHD exist heterogeneity. With the random effect mathematical model to analysis the overall effect, OR=1.22, 95% CI 1.05 to 1.43, p=0.01, Hierarchies analysis according to the regional distribution show all the included studies of Chinese population exist heterogeneity, but all the studies about the European and the USA population exist heterogeneity, all the studies about the Chinese population with the Mantel-Haenszel fix effect mathematical model, OR=0.38, 95% CI 0.10 to 1.44, p=0.15 use the random effects model analysis the European and the USA population, OR=1.24, 95% CI 1.06 to 1.46, p=0.07. All the included studies of the Correlation between Polymorphism of ICAM-1 Gene E469K and CHD in Chinese population exist heterogeneity, use the random effects model analysis the overall effect, OR=2.09, 95% CI 1.40–3 to 12, p=0.003. A significant heterogeneity was found about the Correlation between Polymorphism of PECAM-1+125L/V and CHD. With the random effect mathematical model, the OR for the V allele was 1.17, 95% CI 0.94 to 1.46. Hierarchies analysis according to the regional distribution, No statistical publication bias and heterogeneity was found between 4 studies about the Caucasian population, with the Mantel-Haenszel fix effect mathematical model, the OR for the overall effect of V allele was 1.17, 95% CI 0.94 to 1.46. Hierarchies analysis according to the regional distribution, The statistical packages Statal 10.0 and Reman5.0 were applied for investigating heterogeneity among individual studies and summarising overall effects across studies by proper effect mathematical model, calculating the pooled OR and its 95% CI, and testing the overall effects, Egger’s test were performed for evaluating the publication bias. The sensitivity analysis by different effect model and sample size was employed for the reliability of meta-analysis.

Conclusions No association between the polymorphism of IL-6-174G/C and coronary heart disease in Chinese population, but associated with the European and the USA population, people who carries the C allele had a higher risk to be subject to coronary heart disease. The ICAM-1E469K polymorphism was associated with coronary heart disease in Chinese population, people who carries the K allele had a higher risk to be subject to coronary heart disease. PECAM-1+125L/V were not associated with
coronary heart disease in Caucasian population, but associated with the Chinese population, people who carries the V allele had a higher risk to be subject to coronary heart disease.

**GW23-e0770**  
**ARTERIAL STIFFNESS EVALUATION BY CARDIO-ANKLE VASCULAR INDEX AND ITS RELATED FACTORS ANALYSIS IN ETHIC SHE POPULATION OF CHINA**  
doi:10.1136/heartjnl-2012-302920d.15

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**Objectives** Arterial stiffness is an independent predictor for vascular diseases. Cardio-ankle vascular index (CAVI) is a new index of the overall stiffness of the artery from the origin of the aorta to the ankle. In the present study, we investigated the possible risk factors involving CAVI in Ethnic She Population, one of ethnic groups of China.

**Methods** 408 (age: 47.3±12.8 years, male: 167) natural persons from Ethnic She group were enrolled into our study. Pulse wave velocity (PWV) and CAVI were measured by Complior apparatus. Multivariate analysis was performed to detect independent predictors of PWV among age, sex, body mass index (BMI), systolic blood pressure (SBP), diastolic blood pressure (DBP), low-density lipoprotein cholesterol (LDL-C), uric acid (UA), total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), hypersensitivity C-reactive protein (hs-CRP) and so on.

**Results** The incidences of coronary artery disease, hypertension, diabetes, hyperlipidemia, stroke were 1.7%, 10.3%, 3.2%, 3.4%, 2.2% in the entire group. The value of CAVI was higher in male group than in female group (7.48±1.33 vs 7.10±1.22, p=0.005). CAVI was positively correlated with age, SBP, DBP, glucose, triglyceride, LDL-C, UA, TC in entire group (r=0.570, 0.514, 0.375, 0.184, 0.150, 0.123, 0.101, 0.142, respectively, all p<0.05). There was negative trend between CAVI and BMI, HDL-C respectively, but without significant difference. We found that CAVI was significantly positive correlated with hs-CRP (r=0.191, p=0.004), a marker of inflammation, which indicated there was relationship between arterial stiffness and inflammation. Our result showed that CAVI was positively correlated with PWV (r=0.556, p<0.001), a standard index for arterial stiffness. Multivariate analysis showed that age, SBP, glucose were significant independent predictors of CAVI in all subjects. However, the independent predictors of CAVI were different between male and female groups (age, SBP in male; age, DBP, UA in female, respectively).

**Conclusions** CAVI was a reliable evaluation index of arterial stiffness. The related factors of CAVI were different in different gender. CAVI was correlated with hs-CRP, which provided new theory basis for the mechanism of arterial stiffness. Our research might provide new recommendation for precaution of vascular disease and standard value of CAVI in different ethnic population groups.

**GW23-e0867**  
**VASCULAR CALCIFICATION INCREASES RISK OF HARD CORONARY HEART DISEASES IN THE GENERAL POPULATION OF SOUTH CHINA: A CASE CONTROL STUDY**  
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**Objectives** Vascular calcification (VC) is regarded as an important cardiovascular risk maker and the relevant mechanisms are still under debate. The aim of this study is to evaluate the association between VC and risk of severe coronary events in the general population of South China, and identify the risk factors and predictors of VC.

**Methods** This study recruited 1604 people without coronary heart disease and diabetes mellitus in South China undergoing ankle-brachial index (ABI) test. 38 members were defined as calcification group (ABI≥1.3) and 43 members were randomly selected from all the members with normal ABI (0.9<ABI<1.5) as control group. Biochemical parameters and clinical characteristics were compared between these two groups.

**Results** The Framingham 10-year hard coronary heart disease (HCHD) risk of the calculation group was significant higher than the control group (9.20±4.21% vs 3.21±2.07%, p<0.001). Compared with the control group, the morbidity of hypertension and ischaemic stroke were higher in the calcification group (62.5% vs 38.1%, p<0.05 and 21.9% vs 2.4%, p<0.01). In an adjusted model of binary logistic regression, the OR was 1.195 for BMI and 1.194 for hsCRP (95% CI 1.002 to 1.319 and 1.045 to 1.420). Both of these indexes were the independent risk factors for VC (p<0.05). The areas under the receiver operating characteristic (ROC) curve were 0.629 for BMI and 0.723 for hsCRP. Both BMI and hsCRP were effective predictors for VC (p<0.05).

**Conclusions** VC associated with inflammation and obesity increases the risk of HCHD in general population of South China.

**GW23-e0875**  
**THE DIFFERENCE IN REGULARITY OF ONSET TIMING OF ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AMONG ELDERLY AND MIDDLE-YOUTH PEOPLE. STUDY IN CHINA**  
doi:10.1136/heartjnl-2012-302920d.16

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**Objectives** With aging, the body conditions and ways of social life change; however, it remains uncertain whether the onset timing of acute myocardial infarction (AMI) in elderly people is affected.

**Methods** 2556 consecutive patients with acute ST-section elevation myocardial infarction (STEMI) were selected in China (elderly group ≥65 years, n=1061; middle-youth group <65 years, n=1295) during the period of May 2000 to May 2010, and their circadian variation, weekly distribution, monthly and seasonal variation were examined.

**Results** The frequency of STEMI occurrence in the elderly group was significantly higher than in the middle-youth group in March (p=0.025), which was significantly lower in July (p=0.044). Besides, the frequency of STEMI onset was significantly higher in the elderly group than in the middle-youth group on Monday (p=0.032), which was markedly lower on Saturday (p=0.023). Further, there was an increased frequency of STEMI occurrence at 6 h (p=0.002) and a reduced frequency at 20 h (p=0.023) in the elderly group. From 5:00 to 8:59, the frequency of STEMI onset was significantly higher in the elderly group (p=0.003), whereas from 17:00 to 20:59, it was significantly lower (p=0.045).

**Conclusions** The significant differences were found on the STEMI onset timing among middle-youth people and elderly people. In elderly people, the time of STEMI onset most often occurred with seasonal changes and rotations, working days alternate with resting days, and a more easier morning peak but not an evening peak.
CORONARY CT ANGIOGRAPHY VALIDATES CORONARY RISK FACTORS

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Objectives The Framingham study was the ‘pioneer study’ of coronary risk factors by long-term follow-up of relatively normal populations for major adverse cardiac events (MACE). The accuracy of the prediction has been validated by coronary angiography (CAG). However, CAG shows the arterial lumen while the main pathology is on the arterial wall. The coronary CT angiography (CCTA) provides information on both the arterial lumen and plaque characteristics. Therefore it is better technique to study the coronary risk factors.

Methods CCTA was done consecutively in 706 patients from June 2008 to April 2011 in the department of cardiology. The severity of coronary artery disease (CAD) was graded to ‘normal’, ‘mild’, ‘moderate’, ‘severe’, and ‘revascularisation’. Risk factors were correlated with coronary plaques. Pearson correlation and ANOVA were used to evaluate the relationship between risk factors and coronary plaque. The predictive accuracy was determined by receiver operating characteristic (ROC).

Results A total of 40.37% of patients had normal CCTA whereas 58.63% of patients had abnormal CCTA. There were four main findings. First, the risk factors of age, sex, hypertension, hyperlipidaemia, diabetes mellitus, cerebral infarction, coronary heart disease and myocardial infarction were moderately correlated with coronary-plaque formation of which a clinical diagnosis of CAD was the most accurate predictor, p<0.01. Second, the biochemical parameters of total cholesterol (TC), low-density lipoprotein, high-density lipoprotein, creatinine and homocysteine were moderately correlated with coronary plaque (p<0.01). Third, plaque was correlated with carotid intima-media thickness and Framingham risk score (p<0.01). ROC areas were 0.845 for Framingham risk score, 0.766 for creatinine, 0.697 for homocysteine, 0.695 for IMT and 0.316 for HDL, p<0.001.

Conclusions CCTA has validated the Framingham risk score, creatinine, homocysteine, carotid intima-media thickness and high-density lipoprotein as the major coronary risk factors.

EFFECT OF COMPREHENSIVE INTERVENTION ON BLOOD PRESSURE CONTROL IN CHINESE RURAL POPULATION

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Objectives To evaluate effects of community comprehensive intervention on blood pressure control in mid-western rural area of Shandong province, China.

Methods A comprehensive non-communicable disease control project was launched in mid-western rural area of Shandong province from 2007 to 2010. Health education focusing on a balance diet, physical activity promotion and tobacco and alcohol control was performed in the intervention population. Electronic system was developed for hypertension screening and administration. A baseline survey was performed using multi-stage random sampling methods in 8 counties of mid-western rural area in 2007. Participants aged 25 and above were recruited for a questionnaire survey, physical examination and blood pressure measurement. A total of 20 087 participants aged 25 and above completed in the survey. The final evaluation survey using same questionnaire was performed in 2010, classified in intervention (4071 participants) and control (2145 participants) group. Intervention effect was evaluated by the difference compare between two surveys.

Results Mean systolic blood pressure (SBP) and diastolic blood pressure (DBP) in the baseline population in 2007 were 134.46 and 83.50 mm Hg, respectively, and those in 2010 were 132.47 and 80.80 mm Hg in the intervention group and, and 133.45 and 81.12 mm Hg, in the control group. Significant decreases of SBP and DBP were found between the baseline population in 2007 and the intervention population in 2010. Insignificant decreases were found between the intervention and control population in 2010. Mean blood pressure of hypertensive in 2007 baseline, 2010 intervention and control population were 153.05/91.68 mm Hg, 150.47/87.50 mm Hg and 155.23/88.59 mm Hg respectively. Significant decrease of blood pressure was found in intervention population after intervention. Decrease of SBP showed significant difference in intervention control group compared with control in 2010.

Distribution of non-hypertensive with normal, high normal BP hypertensive at 1, 2 or 3 grade in 2010 intervention population were 19.19%, 48.61%, 18.52%, 9.69%, 3.70% respectively. Proportion of hypertensive at 1, 2 or 3 grade decreased compared with 2007 baseline population while that of normal and high normal BP increased. Compared to 2010 control population, proportion of hypertensive in 2010 intervention population was lower than control population. Awareness, treatment and control rate of hypertension in 2010 intervention population increased significantly by 24.82%, 34.83%, 15.34% compared with 2007 baseline population, also higher than that in 2010 control population. Moderate physical activity and low intake of salt and fat were found to be influence factors for BP control.

Conclusions Community comprehensive intervention produced significant effects on blood pressure control, greater in hypertensive than in normotensive. Awareness, treatment and control rate of hypertension as well as knowledge related with hypertension get improved in intervention group.

A NON-RANDOM STATISTICAL METHOD TO ESTIMATE THE RELATIONSHIP BETWEEN ABI, HBA1C AND RISK FACTORS IN ELDER POPULATION IN SHANGHAI

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Objectives To evaluate the effect of propensity score when the randomised data is destructed or randomisation is unavailable in epidemiological observational studies. To explore the relationship between ankle-brachial index (ABI), HbA1C and other risk factors in the elder population in Shanghai.

Methods During June to September in 2011, 1095 subjects were interviewed including 138 diabetes patients and 957 control individuals in elder population in Shanghai. The non-randomisation data was distributed again using propensity score and the participants were assigned into two groups (diabetes group and non-diabetes group). Pearson correlation coefficient was conducted to estimate...
in sleep duration, snacking, family income and parental recognitions of children’ weight status among participants in different weight categories were observed, which should be taken into account when planning prevention and treatment programmes of paediatric obesity.

**GW23-e2680**

**ARE THE LEFT VENTRICULAR FALSE TENDONS CONNECTING THE BASAL IVS TO THE APICAL OF LEFT VENTRICULAR FREE WALL NORMAL ANATOMIC STRUCTURES?**

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**Objectives** The echo cardiographic detection rates of the left ventricular false tendons (LVFTs) vary widely. Several diseases such as repolarisation abnormal, were relevant to LVFTs. The development of new technology has improved the detection of LVFTs and resolution, It showed that LVFTs may be more popular than ever reported. Nevertheless, the reports of epidemiology of location of LVFTs was few. In this study, we try to investigate the distribution of LVFTs locations in healthy population and hypertensive patients so that make clear which location be the most popular.

**Methods** From 1999 to 2003, we prospectively studied 1475 participants total including 1038 healthy subjects and 437 hypertensive patients. Every subject was examined using echocardiography with second harmonic imaging. The attachments of the LVFTs on ventricular wall were recorded. We visually measured the included angle formed by the interventricular septum and the LVFTs and classified the LVFTs accordingly as longitudinal (≤45°) and transverse (>45°) types. The \( \chi^2 \) test was used to compare the rates of LVFTs between groups.

**Results** Total of 1264 LVFTs were present in 1177 (79.8%) of 1475 participants. Of 1264 LVFTs identified in 1177 participants, There were no significant differences between males and females in the detection rates of LVFTs between males and females (597/749 vs 580/746, respectively; \( p>0.05 \)), also between healthy subjects and hypertensive patients. The most common connection of the LVFTs was connecting the basal intraventricular septum to the apical left ventricular free wall (1094/1264, 86.6%).

**Conclusions** LVFTs are commonly visualised using echocardiography. More than four locations of LVFTs were observed. The most common connection of the LVFTs was connecting the basal invetricular septum to the apical left ventricular free wall. It suggested that the LVFTs at such location may be normal anatomic structures in the left ventricular cavity. The result will be helpful for us to investigate the distribution of LVFTs attachments in other repolarisation diseases in further studies.

**GW23-e2491**

**INEQUALITIES IN LIFESTYLE BEHAVIOURS, DIETARY HABITS AND FAMILIAL FACTORS AMONG NORMAL WEIGHT, OVERWEIGHT OR OBESE CHINESE CHILDREN AND ADOLESCENTS**

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**Objectives** Paediatric obesity has become a global public health problem. Data on the lifestyle behaviours, dietary habits and familial factors of overweight and obese children and adolescents are limited. The present study aimed to compare the health related factors among normal weight, overweight and obese Chinese children and adolescents.

**Methods** We conducted a cross-sectional study consisted of 4262 children and adolescents aged 5–18 years. Anthropometric measurements and information on health related variables, such as physical activities, sleep duration, dietary habits, family income and recognitions of weight status from views of both children and parents, were collected by well-trained personnel.

**Results** The prevalence of overweight and obesity was 15.3% and 6.4%, respectively. Compared to girls, boys had a much higher prevalence of either overweight (17.5% vs 12.9%) or obesity (9.5% vs 3.1%). About half of the parents with an overweight or obese child failed to recognize their child’s abnormal weight status, and 65% with an overweight child would not take measures to decrease their child’s body weight. Obese children and adolescents had higher likelihood to be nonsnackers (OR: 1.548, 95% CI 1.039 to 2.248) or to have a family income 2000 CNY or more per month (OR:1.442, 95% CI 1.045 to 1.99) and were less likely to have longer sleep (>7.5 h) (OR:0.475, 95% CI 0.31 to 0.728) compared to the ones with normal weight.

**Conclusions** Our study indicated a high prevalence of paediatric overweight and obesity in a large Chinese population. Inequalities of paroxysmal atrial fibrillation (PAF).

**GW23-e2447**

**LONG-TERM EFFICACY OF THE LOW DOSE AMIODARONE THERAPY FOR THE PREVENTION OF RECURRENCE OF PAROXYSMAL ATRIAL FIBRILLATION**

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**Objectives** To investigate the efficacy and safety of the low dose oral amiodarone therapy in patients for the long-term prevention of paroxysmal atrial fibrillation (PAF).
Methods Usage of Amiodarone After conversion by using medicine or electroversion or spontaneous conversion, a initial dose of amiodarone was given within 2 weeks as follows, 0.2 g for three times a day for the first week and then 0.2 g for two times a day during the second week. The maintenance dose of amiodarone (0.1–0.2 g for one time a day) was administered from the third week.

Results Sixty-two consecutive patients with PAF were followed up after amiodarone was orally administered. The mean duration of follow-up was 16.3±8.3 (1–24) years. 6 months, 12 months and 24 months after amiodarone treatment. The clinical effective rate was 86.44%, 75.86%, 59.0% and 73.3% respectively. No patient had significant side effects. The univariate analysis demonstrated that there were differences on the sides included age (≥65 years old) and coronary heart disease in the 2 groups (U=230.500, p=0.006; X²=6.651, p=0.010). Through Logistic regression analysis, age (≥65 years old) and coronary heart disease were confirmed not to be independent risk factors for the efficacy of amiodarone therapy (OR=4.060, p=0.060; OR=0.555, p=0.196). There were 14 cases (22.95%) with sinus bradycardia, among them, four cases stop taking them and three cases install heart pacemakers, but no case occur serious arrhythmia or Cardiac dysfunction worse and angina symptoms. There were 12 cases with abnormal thyroid function, among them 7 case (11.48%) with Hypothyroidism. No severe side effects were observed in other cases.

Conclusions Amiodarone may provide an effective and relatively safety therapeutic approach to maintaining sinus rhythm in patients with paroxysmal atrial fibrillation. The adverse drug reactions of amiodarone should be observed during the medication period. There were no evidence suggest age (≥65 years old), heart function classification, left atrium diameter, BMI body mass index, the history of PAF, ACEI and ARB, coronary heart disease, were confirmed not to be independent risk factors for the efficacy of amiodarone therapy.

GW23-e0242 PREVALENCE AND TRENDS IN HEART DISEASES DURING THE PAST 8 YEARS (2004–2011) IN CHINA BASED ON AN ECHOCARDIOGRAPHY DATA

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Objectives Data about prevalence and trends in heart diseases during the recent years in China are lacking. Using a large echocardiography data in our center, the objective of the study was to analyse the prevalence and trends in several common heart diseases during the past 8 years.

Methods This study retrospectively analysed the 2-D echocardiographic data in our department from 2004 to 2011.

Results A total of 312 850 cases were included in the study. There was a trend toward decreasing incidence of rheumatic heart disease during past 8 years, from 5.49% in 2004 to 3.05% in 2011. Infective endocarditis was also decreased, from an average incidence of 0.37% during the first 4 years to 0.27% during the last 4 years. The incidence of hypertrophic cardiomyopathy, including 20% apical hypertrophic cardiomyopathy and 20% hypertrophic obstructive cardiomyopathy, was about 1.8%. The total incidence of three most common congenital heart diseases, that is, atrial septal defect, ventricular septal defect and patent ductus arteriosus, decreased about 30% during the 8 years, from 5.53% in 2004 to 3.80% in 2011. The incidence of patients with moderate pulmonary arterial hypertension (PAH) or left ventricular systolic dysfunction (LVSD) decreased during the 8 years, while severe PAH or LVSD did not change.

Conclusions The present study showed the prevalence and trends in several common heart diseases during the past 8 years in China.
79 years in 1999 (n=4850) and 2009 (n=5456) using multistage clustering sampling separately. The demographic characteristics, blood pressure (BP) and associated risk factors were examined for all of subjects.

**Results** Mean levels of systolic BP and diastolic BP in subjects of 1999 and 2009 increased from 117.83±53.86 mm Hg to 132.10±21.16 mm Hg (p<0.001), and 75.28±19.14 to 79.25±11.15 mm Hg (p<0.001) over past decade, respectively. The age and sex standardised prevalence of hypertension increased from 27.68% (1999–2000) to 29.40% (2009–2010) (p<0.001). The awareness rate increased slightly, from 37.70% to 42.52% (p<0.001). The treatment rate increased from 20.91% to 28.04 significantly (p<0.0001). While among subjects aware of their hypertension, the treatment rate increased from 46.85% to 65.80% (p<0.001). In community Hypertensive, control rate increased from 6.51% (1999–2000) to 6.85% (2009–2010) (p=0.6684). Nevertheless, in hypertensives who aware and treated, the control rate remarkably decreased from 32.52% to 24.34% (p=0.020).

**Conclusions** Hypertension prevalence increased steadily over last decades, while awareness, treatment and control rates remained unacceptably low. There were little improvements in hypertension awareness and control rate. It was suggested that community health education is one of critical issue for hypertensive management. More efforts should be taken to improve awareness in community population, as well as treatment and control rates.

**GW23-e0085**  
**BLOOD PRESSURE CONTROL IN CHINESE HYPERTENSIVE PATIENTS WITH DIFFERENT SOCIO-ECONOMIC STATUS AND MEDICAL INSURANCE**

**Methods** 5206 hypertension patients from 46 hospitals were recruited from June to December 2010. A cluster sampling of 100–200 consecutively patients who visited the outpatient department and met the entry criteria of this study was selected in each hospital. The information was collected by a questionnaire survey, a physical examination and also the laboratory tests for each of the patients. This study included 4985 patients who have complete data.

The definition of socio-economic status (SES) and medical insurance mode: the SES score (SES-1) were developed and calculated based on the information of education, occupation and annual income using principal component analysis. We divided the patients in accordance with the quartile of SES-1 score (-0.64, 0.01, 0.65) into four groups: lower, lower-middle, upper-middle and upper. Moreover, we included education, occupation, annual income and ratio of medical insurance and created a new score, SES-2 score. We also divided the patients into four groups.

The differences of the control of hypertension were analysed between various levels SES-1 score, types of medical insurance, and SES-2 score, using the univariate and multivariate logistic regression methods.

**Results** The control rate of blood pressure was 35.2% in all of study population, 24.2%, 37.0%, 41.4% and 41.2% in each group of SES-1 level, respectively, which is granted from lowest to highest, 46.3%, 38.5%, 23.1 and 19.5% in patients with Free medical care, Urban basic medical insurance, no insurance, New-type Rural Cooperative Medical Insurance, respectively, and 21.0%, 34.7%, 40.5% and 44.8% in each group of SES-2 level, respectively, which is granted from lowest to highest. Logistic regression analysis showed that, SES and medical insurance were independently associated with the control of blood pressure after adjustment for baseline blood pressure, age, gender, the duration of hypertension and other factors affecting blood pressure.

**Conclusions** Socio-economic status and medical insurance were associated with the control rate of hypertension. We should improve social-economic status and the medical insurance level actively, contributing to develop the control rate of blood pressure in hypertensive patients.

**GW23-e0170**  
**INTERLEUKIN-6-MEDIATED UPREGULATION OF BRAIN NATRIURETIC PEPTIDE EXPRESSION VIA THE JAK2/STAT3 SIGNALLING PATHWAY IN NEONATAL RAT CARDIOMYOCYTES**

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**Objectives** We have shown that interleukin-6 (IL-6) upregulates brain natriuretic peptide (BNP) expression in rat cardiomyocytes under ischaemic conditions, partly via the transforming growth factor β1 (TGF-β1)/SMAD2 signal pathway. Studies have shown that the IL-6/Janus kinase 2 (JAK2)/signal transducer and activator of transcription 3 (STAT3) signalling pathway plays a significant role in myocardial ischaemic injury. We have questioned whether JAK2 and STAT3 proteins also participate in IL-6-mediated regulation of BNP in neonatal rat cardiomyocytes.

**Methods** Direct drug intervention with IL-6 showed that IL-6 independently activates the JAK2/STAT3 pathway in neonatal rat cardiomyocytes.

**Results** Moreover, increased phosphorylation of the STAT3 protein was first detectable after 5 min of IL-6 stimulation; phosphorylation was highest at 15 min and returned to basal level within 1 h. A specific inhibitor was then chosen to investigate the role of the JAK2/STAT3 pathway. Pretreatment with 10 mM AG490, a specific inhibitor for JAK2 protein, could suppress the increase in BNP levels induced by the administration of 10 ng/ml of IL-6, and maximal inhibition is achieved at a 50 mM concentration of AG490. Furthermore, combinational inhibition with neutralising antibody, which blocks the TGF-β1/SMAD2 pathway, and AG490 failed to completely suppress the increase in BNP levels.

**Conclusions** Thus, apart from the TGF-β1/SMAD2 signalling pathway, the JAK2/STAT3 pathway is also important in the IL-6-mediated regulation of BNP in neonatal cardiomyocytes; other signalling pathways may also be involved in this process.

**GW23-e1694**  
**THE RISK FACTORS AND FOLLOW-UP ANALYSIS OF DIABETES MELLITUS COMBINE WITH HYPERTENSION PATIENTS**

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**Objectives** To analyse the prevalence and risk factors of diabetes combine with hypertension in the Kaiuan employees. To analyse
the prevalence and the incidence rate of hypertension in diabetic patients, and analyse the cardiovascular and cerebrovascular events and death after 5 years’ follow-up.

Methods Arry out health survey for the Kailuan employees applying cluster sampling method during 2005–2006. 9298 diabetic patients were selected as research subjects. Using a combination methods of retrospective analysis and prospective study. Analyse the prevalence and risk factors of hypertension in diabetic patients. These patients were followed up for 5 years, then analysed the prevalence and incidence rate of hypertension, the cardiovascular and cerebrovascular events and death. Application Excel for databases and SPSS13.0 software for statistical analysis.

Results Among 9298 diabetes patients, hypertension prevalence was 26.0%. After univariate analysis and the Logist multivariate regression analysis, increasing age, female, smoking, more salt intake, overweight, elevated level of triglycerides, elevated level of low density lipoprotein, reduced level of high density lipoprotein, elevated level of uric acid, metabolic syndroms were risk factors for diabetes patients with hypertension. Followed for 5 years, the prevalence of hypertension was 31.4%, new cases of hypertension were 495 people, the incidence rate of hypertension was 5.3%. In the patients of diabetes with hypertension, the incidence of myocardial infarction, cerebral infarction was significantly higher than normal blood pressure group. The occurrence of all-cause mortality and cardiovascular disease death rate was higher than normal blood pressure group.

Conclusions The patients of diabetes combine with hypertension were often associated with more cardiovascular disease risk factors, more prone to have cardiovascular and cerebrovascular events and death. We should further strengthen the comprehensive prevention to control and reduce cardiovascular and cerebrovascular events.

GW23-e1796 THE CHANGES OF SERUM LIPIDS IN CHINESE MULTI-PROVINCIAL COHORT STUDY

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Objectives To explore the changes in serum total cholesterol (TC) and low-density lipoprotein cholesterol (LDL-C) levels from 1992 to 2007, and analyse the characteristics of the changes in different subgroup of subjects.

Methods A total of 11,387 subjects aged 35–64 years were recruited from six provinces in China in the baseline survey in 1992, and were followed-up for cardiovascular disease till 2007. In 2007, 9184 subjects were successfully followed-up and 5966 subjects participated in the second examination. Totally 5740 participants, who had complete blood lipids information for both surveys, were included in this analysis. Baselines age were categorised into three groups: 1=35–44 years, 2=45–54 years and 3=55–64 years.

Results 1. In 1992, the mean level of TC was 179.5 mg/dl in men and 178.9 mg/dl in women, and LDL-C was 102.8 mg/dl in men and 101.8 mg/dl in women. In 2007, TC levels increased 12.6 mg/dl and 31.4 mg/dl in men and women, and LDL-C levels increased 19.0 mg/dl and 28.0 mg/dl in men and women, respectively.

2. During the 15 years, in age-group 1, the mean levels of TC increased 29.7 mg/dl, and LDL-C levels increased 29.4 mg/dl; in age-group 2, the levels increased 19.1 mg/dl and 21.8 mg/dl, separately; in age-group 3, the levels increased 10.9 mg/dl and 14.0 mg/dl, separately. The lipids levels change in age-groups was statistically significant (p<0.01).

3. Baseline lipids quintile was a stratification standard, except for the fifth quintile group, the changes of lipids levels in other groups were increased during the 15 years. For example, the first quintile of TC levels increased 36.4 mg/dl and 56.3 mg/dl in men and women, respectively; the third quintile of TC levels increased 14.1 mg/dl and 34.0 mg/dl, separately; but the fifth quintile had no increase, the changes were −14.2 mg/dl in men and 0.0 mg/dl in women. During the 15 years, the first quintile of LDL-C levels increased 46.7 mg/dl and 52.9 mg/dl in men and women, respectively; the third quintile of LDL-C levels increased 19.2 mg/dl and 32.6 mg/dl, separately; but the fifth quintile showed decreasing changes, the changes were −9.6 mg/dl in men and −6.0 mg/dl in women.

Conclusions From 1992 to 2007, the levels of TC and LDL-C were increased rapidly in multi-provincial cohort population. The increased rate of lipids was women more than men, and young group more than the older group. During the 15 years, the increased rate of lipids was the low levels group more than high levels group. To control the increase of TC levels in populations, especially in the young group individuals, was an important measure of early prevention of risk factors of cardiovascular disease.

GW23-e1933 STUDY ON EFFECT OF SMOKING ON PULSE WAVE VELOCITY AND CAROTID ARTERY INTIMA-MEDIA THICKNESS AS WELL AS ANKLE-BRACHIAL INDEX IN AGED PEOPLE

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Objectives To study the pulse wave velocity and carotid artery intima-media thickness as well as ankle-brachial index in aged people with smoking.

Methods A total of 1659 people over 60 years who were resident population in somewhere of jiangsu province were involved in the follow-up survey. The smoking time and proportion of male with female were as investigation indices; pulse wave velocity and carotid artery intima-media thickness as well as ankle-brachial index were tested as general clinical data.

Results 1035 male and 621 female were in research, 478 were smokers, and the total smoking rate is 28.8%, while the percentage of smoking was 44.2% in all male, 31.1% in all female. The smoking rate in male was significantly more than that in female, almost smoking time was 10 years. Compared with non-smokers, the pulse wave velocity of smokers speeded up at different levels, the carotid artery intima-media thickness was in increasing trend, the detection rate of ankle-brachial index was 13.0%, while 0.08% in non-smokers.

Conclusions The male smokers were more than female smokers in the area, arteriosclerosis of cardiovascular diseases were induced easily in smoking population.
ELASTICITY OF BLOOD VESSEL DECREASED INDUCED BY AGING IS THE MAIN FACTOR OF VASCULAR SENESCENCE

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Objectives To explore the ankle brachial index (ABI) and brachial-ankle pulse wave velocity (baPWV) in the same group of healthy people in longitudinal section. To investigate the elasticity of blood vessel decreasing rate with aging.

Methods Based on the healthy people cohort in 2008 in Shenyang, the healthy people were divided into <45-years old, 45–54 years old, 55–64 years old, 65–74 years old and >74 years old groups according 2008 age. We conduct 310 self-control analysis after 3 years later. They finished biochemistry, carotid ultrasonograph, limb blood pressure detected by arteriosclerosis detector (systolic blood pressure, diastolic blood pressure, pulse pressure), baPWV, ABI and so on.

Results There are significant differences between serum total cholesterol, low-density lipoprotein, systolic blood pressure, diastolic blood pressure, pulse pressure, ABI, baPWV, ABI changed value and baPWV changed value in different groups in 310 healthy people (p<0.05). There are positive correlation between serum low-density lipoprotein, serum uric acid, systolic blood pressure, diastolic blood pressure, pulse pressure, ABI, baPWV, baPWV changed value and age (p<0.05). There is negative correlation between ABI changed value and age. There are significant differences of high-density lipoprotein, low-density lipoprotein, serum uric acid, fasting plasma glucose, systolic blood pressure, diastolic blood pressure, pulse pressure, ABI, baPWV in the two examination (p<0.01) after self-control analysis.

Conclusions There are association between age and ABI and baPWV. Elasticity of blood vessel decreased induced by aging is the main factor of vascular senescence.

LACK OF INDEPENDENT RELATIONSHIP BETWEEN NORMAL AGING-RELATED KIDNEY AND CARDIAC DIASTOLIC FUNCTION DECLINES IN A HEALTHY CHINESE POPULATION

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Objectives Decline of normal, aging-related kidney function is an independent predictor for cardiovascular events and death. However, the relationship between normal aging-related kidney function decline within the normal range and cardiac diastolic function in healthy Chinese populations is unknown.

Methods We evaluated the relationships between estimated glomerular filtration rate (eGFR) as well as serum cystatin C (CYSC) and cardiac systolic and diastolic function in a population-based, cross-sectional sample of 852 adults (free from cardiovascular disease with eGFR >60 ml/min/1.73 m²) aged 30–98 years from Shenyang, Dalian and Beijing in China. eGFR was estimated using the modification of diet in renal disease (MDRD) equation. All subjects were divided into four groups according to the quartiles of eGFR and CYSC. Cardiac diastolic function was measured by ratio of peak velocity of early filling to peak velocity of atrial filling (E/A), which was derived by B-mode echocardiography. In the present study, lower E/A was defined as measures under the 25th per centile of sample distribution (0.784).

Results Both eGFR and CYSC were significantly correlated with age (eGFR: r=−0.102, p<0.01; CYSC: r=0.544, p<0.01). Age was significantly associated with E/A (r=−0.381, p<0.01). Binary logistic regression analysis revealed that second, third and fourth quartile groups of CYSC were associated with lower E/A in an unadjusted model with ORs of 2.49 (1.403–4.419), 4.177 (2.368–7.37), and 7.614 (4.387–13.217), respectively. However, this association was lost after full adjustment. eGFR was only associated with lower E/A in group IV (fourth quartile; 2.058, 95% CI 1.3 to 3.258) in an unadjusted model, and this association was lost after age adjustment.

Conclusions We conclude that aging is a major factor contributing to declines in kidney and cardiac diastolic function in a healthy population but there is no independent relationship between normal aging-related kidney and cardiac diastolic function declines.

IDENTIFICATION OF HTRA GENE AND IMMUNOREACTIVITY ANALYSIS OF HTRA PROTEIN IN β-HEMOLYTIC STREPTOCOCCI

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Objectives To investigate whether Htra homologous genes were present in the 44 BHS isolates from children with acute throat infection or tonsillitis in Guangzhou recently and analyse the immunoreactivity of Htra protein.

Methods Htra genes were amplified by PCR and identified by sequencing. Then the htra gene from GAS was cloned into pGEX4T-1 vector and Htra protein was expressed in E.coli BL21. The recombinant Htra protein was identified by Western blot with anti-GST rabbit mAb and its immunoreactivity was analysed by Western blot with the sera from mice infected with BHS.

Results All of the 44 BHS isolates harboured the htra genes which were 99% identical with the gene of GAS. Western blot confirmed that both anti-GST rabbit mAb and the sera from mice infected with GAS could react specifically with the recombinant Htra protein, while the sera from other group couldn’t.

Conclusions All of the BHS isolates contain Htra gene which is the same as the known GAS gene and is different from the known GBS and GCS gene. GAS infection is able to induce antibody against Htra protein. This indicates that Htra protein acts as a dominant immunogen in GAS, while the immunoreactivity of HtrA proteins from other groups of streptococci is still unknown.

EPIDEMIOLOGICAL EVIDENCE FOR THE LINKS BETWEEN SLEEP DURATION AND HIGH BLOOD PRESSURE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives To assess whether the relationship between short or long sleep duration and hypertension is present from epidemiologic evidence, and investigate the relationship quantitatively.
**Methods** We performed a comprehensive search of cross-sectional and longitudinal studies using PubMed and the Cochrane Library through February 2012. This was supplemented by review of reference lists of original and relevant reviews. After the related data were extracted by two investigators independently, pooled ORs or relative risks (RRs) were estimated using a random-effects model or a fixed-effects model. Publication bias was evaluated, and sensitivity and meta-regression analyses were performed.

**Results** Thirty-two articles met our inclusion criteria (24 studies among adults and 8 among children and adolescents), with age ranging from 3 to 106 years. Twenty-one adult studies involving 225,858 subjects were included in the meta-analysis. The pooled result from cross-sectional studies showed that short sleep duration was associated with a greater risk of hypertension (OR: 1.21, 95% CI 1.09 to 1.34, p < 0.001), and long sleep duration also increased the risk of hypertension (OR: 1.11, 95% CI 1.04 to 1.18, p = 0.003). There was no evidence of publication bias. Pooled analysis from longitudinal studies indicated a significant association between short sleep duration and hypertension (RR: 1.23, 95% CI 1.06 to 1.42, p = 0.005), but an insignificant relationship between long sleep duration and hypertension (RR: 1.02, 95% CI: 0.91 to 1.14, p = 0.732). The effects of sleep duration differed by gender, location of the populations and definitions of short or long sleep duration. Meta-regression analysis including seven variables did not find the sources of heterogeneity. After a descriptive analysis of related studies among children and adolescents, we found this association was controversial.

**Conclusions** Among adults, a U-shaped relationship between habitual sleep duration and hypertension was found in a cross-sectional level. Short sleep duration was associated with a higher risk of hypertension even longitudinally. More attention needs to be paid to this lifestyle factor.

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**LACK OF ASSOCIATION BETWEEN GENETIC POLYMORPHISMS AFFECTING AUTONOMIC ACTIVITY AND CORONARY ARTERY SPASM**

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**Objectives** Autonomic activity appears to play an important role in controlling the vasomotor tone and, thus, may be associated with coronary artery spasm (CAS). We investigated the association of the common functional polymorphisms affecting autonomic activity and CAS. The candidates were α2δ_Del301-303, α2δ_Del322-325, β2Gln27Glu and GNB3 C825T polymorphisms.

**Methods** One hundred and nine patients with CAS, confirmed by coronary angiography with or without acetylcholine provocation test, and ninety-four apparently healthy control subjects were investigated for genotype of the 4 polymorphisms and established risk factors of ischemic heart disease.

**Results** The minor alleles were α2δ_Del301-303, α2δ_Del322-325, β2Gln27Glu and GNB3 C825T and their frequencies were 45.4%, 13.3%, 13.3%, and 46.8%, respectively, in the control subjects of this Chinese population, which were different from those of other ethnic groups. On univariate analysis, smoking and body mass index were significant risk factors for CAS. After multivariate analysis using binary logistic regression model, male sex (odds ratio [OR] 2.707, CI 1.249-5.865, P = 0.012), body mass index (OR 1.580, CI 1.335-1.869, P < 0.001) and smoking (OR 9.608, CI 4.276-21.590, P < 0.001) were considered as independent risk factors. No association of the aforementioned genetic variants with CAS was found.

**Conclusions** Smoking and body mass index were significant risk factors for CAS. However, none of the considered polymorphisms influencing autonomic activity is a major risk factor for CAS in Chinese patients, which was conflicting with previous studies of other ethnic groups to a certain extent. This result suggests the significant difference of genetic background in different ethnic groups.
**Results** Of 250 patients (age 55.6±7.8 years) undergoing coronary angiography, Metabolic syndrome was diagnosed in 79%; abdominal obesity, low HDL and hypertension were the commonest of the diagnostic criteria of MS, being present in >70% cases. As expected, with progressively increasing BMI, the prevalence of MS increased (56 and 51% in those with BMI 23–24.9 and BMI ≥ 25 kg/m², respectively); however despite having a normal BMI (<23 kg/m²), 16% patients satisfied the diagnostic criteria of MS.

The prevalence of double or triple vessel CAD was significantly more common in patients with MS as compared to those without MS (64 vs 40%, p=0.02), while the incidence of angiographically normal coronary arteries was also significantly less in patients with MS as compared to those without MS (8 vs 32%, p<0.05). Patients with MS had significantly higher mean FRS than those without MS (16.2 vs 8.75, p<0.0001). Most patients with MS (78%) had an intermediate to high 10 year CV risk (>10%) as estimated by FRS.

We observed that with increasing FRS risk scores, the proportion of patients having MS also increased, of those with low, intermediate and high FRS, 61, 87 and 92% respectively had Metabolic Syndrome. To observe the independent effects of MS and FRS, patients were categorised into age quartiles (<45 years, 45–55 years, 55–65 years and >65 years). Though the incidence of Metabolic Syndrome was nearly similar amongst all age quartiles (75%, 79%, 81%, 82% respectively), distribution of FRS among different age groups was quite dissimilar. Despite angiographically documented CAD, in patients <45 years none of the patients were categorised as high FRS. Only 15 and 17% patients could be categorised as having high FRS in age groups 45–55 and 55–65 years, while in patients older than 65 years, 50% were classified as having high FRS. This analysis helped highlight the obvious limitation of age dependence of FRS.

**Conclusions** Metabolic syndrome is very commonly observed in Indian patients with angiographically documented CAD; more than 70% patients with MS have 10 year CV risk of >10% as estimated by FRS. Patients with MS had higher incidence of angiographically documented double or triple vessel disease and much less incidence of having normal coronaries as compared to those without MS. In populations like Asian Indians, where patients often develop CAD at a younger age, FRS due to its age dependence may underestimate the CV risk despite the patients having angiographically documented CAD. In our study too, in patients <45 years of age, despite presence of angiographic CAD, none of the patients had high FRS. These findings have significant health implications for Asian patients with CAD in whom there should be continued health care emphasis on detection of MS and intensification of adequate preventive strategies.

**GW23-e2430 THE EFFECT OF SMOKING STATUS ON PROGNOSIS OF PATIENTS WITH ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION AFTER EMERGENCY PERCUTANEOUS CORONARY INTERVENTION**

**Objectives** The aim of the study was to evaluate whether the prognosis of patients with acute ST-segment elevation myocardial (ASTEMI) may differ according to smoking status after percutaneous coronary intervention (PCI).

**Methods** The consecutive patients with ASTEMI who were admitted to 20 hospitals between May 2009 and May 2010 in LiaoNing province. Patients were divided into smoker group and non-smoker group on admission. Basic demographic, treatment data and clinical outcome were compared between groups. Survival curves, log-rank test and Cox proportional hazard analysis were estimation.

**Results** 402 patients were enrolled, the rate of smoking was 56.7%. 228 patients in smoker group and 174 patients in non-smoker group. The smoker group were significantly younger than the non-smoker group (56.47±10.90 years vs 64.86±11.97 years, p<0.001). The percentage of man was significantly higher in smoker group than the non-smoker group (56.47±10.90 years vs 64.86±11.97 years, p<0.001). The non-smoker group had significantly higher rate of myocardial infarction, hypertension and diabetes than the smoker group (p<0.05). The non-smoker group had significantly higher rate of multi-vessels disease than smoker group, the smoker group was associated with the increased rate of 1 vessel disease compared to non-smoker group (p=0.04). In-hospital and follow-up mortality and the cumulative survival rate were no significant difference between 2 groups. The mortality was significantly related to age (HR:1.118, 95% CI 1.069 to 1.168, p<0.001), body mass
**GW23-e1915** THE LINK BETWEEN ERECTILE DYSFUNCTION AND CARDIOVASCULAR DISEASE IN SOUTHERN CHINA PATIENTS WITH METABOLIC SYNDROME

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**Introduction** The overall prevalence of erectile dysfunction (ED) is high in men of aged >40 years and increases greatly in the elderly. In particular, severity and prevalence both increase with aging. ED is associated with deleterious changes in the overall vasculature and is recognised as an indicator of higher risk for future cardiovascular events. In men aged <60 years and in men with diabetes or hypertension, ED can be a critical warning sign for existing or impending cardiovascular disease (CVD). Endothelial dysfunction, vascular smooth muscle changes and increased fibrosis are indicated as major players in both ED and CVD. ED is associated with smoking, physical inactivity, dyslipidemia, obesity, diabetes, hypertension and so on. Obesity is now regarded as one of the most important risk factors for some diseases such as coronary artery disease (CAD), hypertension, diabetes and CVD. The metabolic syndrome (MetS) consists of a myriad of abnormalities, including central obesity, glucose intolerance, dyslipidemia, and hypertension. Body mass index (BMI) is widely used to describe the risk factors for MetS as an important parameter of obesity. This study is designed to evaluate the link between ED and CVD in southern China patients with MetS.

**Objectives** To assess the link between ED and CVD in the patients with MetS.

**Methods**

**Results** The prevalence of CVD in normal, overweight and obesity patients were reported by 6.48% (7/108), 20.31% (13/64), and 44.74% (17/38), respectively. The subjects with high BMI (BMI>or = 24 kg/m²) showed a significant increase for CVD compared with those with normal BMI (p=0.001). IIEF-5 scores in high BMI group were found significantly lower than the control group (p<0.01). There were no statistically significant differences in IIEF-5 scores between overweight and normal BMI groups (p=0.12).

**Conclusions** The patients with ASTEMI after PCI, smokers were reported by 6.48% (7/108), 20.31% (13/64), and 44.74% (17/38), respectively. The subjects with high BMI (BMI>or = 24 kg/m²) showed a significant increase for CVD compared with those with normal BMI (p<0.001). IIEF-5 scores in high BMI group were found significantly lower than the control group (p=0.001). There were no statistically significant differences in IIEF-5 scores between overweight and normal BMI groups (p=0.12).

**Prevention of cardiovascular disease**

**GW23-e2155**

**EFFICACY OF FOLIC ACID SUPPLEMENTATION IN STROKE PREVENTION: NEW INSIGHT FROM A META-ANALYSIS**

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**Objectives** There are growing data and a continuing controversy over the efficacy of folic acid supplementation in stroke prevention. We conducted a meta-analysis based on relevant, up-to-date published randomised trials to further examine this issue.

**Methods** Relative risk (RR) was used to measure the effect of folic acid supplementation on risk of stroke with a fixed-effects model.

**Results** Overall, folic acid supplementation reduced the risk of stroke by 8% (n=55,764, RR: 0.92, 95% CI 0.86 to 1.00, p=0.038). In the 10 trials with no or partial folic acid fortification (n=43,426), the risk of stroke was reduced by 11% (0.89, 0.82–0.97, p=0.010). Within these trials, a greater beneficial effect was observer among trials with a lower percent use of statins (<80% (median), 0.77, 0.64–0.92, p=0.005), and a meta-regression analysis also suggested a positive dose-response relationship between percent use of statins and log-RR for stroke associated with folic acid supplementation (p=0.013). A daily dose of 0.4–0.5 mg folic acid appeared to be adequate for stroke prevention in comparison with larger doses. In the remaining 5 trials conducted in populations with folic acid fortification (n=12,338), folic acid supplementation had no effect on stroke risk (1.03, 0.88–1.21, p=0.69).

**Conclusions** Our analysis indicated that folic acid supplementation is effective in stroke prevention in populations with no or partial folic acid fortification. Additionally, a greater beneficial effect was observed among trials with a lower percent use of statins.

**GW23-e2562**

**BLOOD PRESSURE/HEIGHT RATIO: A NEW METHOD FOR DIAGNOSING PAEDIATRIC HYPERTENSION**

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**Objectives** A new method using systolic blood pressure-to-height ratio (SBPHR) and diastolic blood pressure-to-height ratio (DBPHR) for diagnosing hypertension has been raised recently. We aimed to further confirm and examine whether it is applicable in children.

**Methods** We conducted a cross-sectional study consisted of 6837 children and adolescents aged 5–18 years. Blood pressure was measured and classified using the population-based percentiles.

**Results** Areas under the receiver-operating characteristic curve of SBPHR and DBPHR were all >0.9 across all ages except for that identifying the level of SBP between 90th and 95th percentile. For adolescents, similar cutoff points for diagnosing hypertension were found compared to previous study with high sensitivities and specificities, especially for stage 2 hypertension (all >95%). Among children, good diagnostic value was also observed.

**Conclusions** SBPHR and DBPHR were practical for detecting hypertension, particularly stage 2 hypertension among adolescents and children if confirmed by further investigations.

**ABSTRACTS**

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findings underscore the importance of identifying target populations that can particularly benefit from folic acid therapy.

**GW23-e0890  GENDER DIFFERENCES IN VASCULAR ENDOTHELIAL FUNCTION AND CAROTID INTIMA MEDIA THICKNESS BY FRAMINGHAM RISK SCORE**

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**Objectives** Vascular dysfunction is associated with increased risk for adverse cardiovascular events. However, less is known about gender differences in endothelial function and arterial intima thickness according to Framingham risk score. The purpose of this study is to investigate whether the gender differences are existed in flow-mediated vasodilation and carotid intima thickness by Framingham risk score (FRS).

**Methods** According to the Framingham risk score, 1083 subjects (544 males and 539 females) were divided into three groups: low-risk, middle risk and high-risk group respectively. Brachial arterial flow-mediated vasodilation (FMD) and carotid intima media thickness (IMT) were measured by high frequency ultrasound.

**Results** With the increasing of the Framingham risk score, FMD reduced and carotid IMT increased in both genders (p<0.001). Compared with males, FMD of females were significantly higher in the low-risk FRS group (female to male: 9.76±3.62% vs 8.31±2.89%, p<0.001). However, FMD of females were significantly lower than males in the mid-risk and the high risk group (female to male: 6.67±2.42% vs 7.45±2.65%, 5.78±2.39% vs 6.41±2.27%, respectively, p<0.001. But there are no significant gender differences in carotid IMT among the three groups.

**Conclusions** Gender differences are existed in FMD not in carotid IMT according to the Framingham risk score. FMD is more sensitive than IMT to response the gender difference in vascular function under Framingham risk stratification.

**GW23-e0061  RISK FACTORS OF CARDIAC TROTONIN T ELEVATION IN PATIENTS WITH STABLE CORONARY ARTERY DISEASE AFTER ELECTIVE CORONARY DRUG-ELUTING STENT IMPLANTATION**

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**Objectives** Cardiac troponin T elevation after coronary intervention has been demonstrated to be associated with the prognosis of coronary artery disease (CAD). However, there were few studies about comprehensive risk factors analysis of troponin T elevation after elective drug-eluting stent (DES) implantation.

**Methods** From March to December in 2010, patients with stable CAD were admitted for elective coronary intervention in our hospital. They were divided into elevated troponin T group and normal troponin T group by post-procedural troponin T. Clinical factors, laboratory-test factors and angiographic factors (such as gender, age, cholesterol, Gensini score and so on) were analysed.

**Results** A total of 209 patients with an average age of 64.0±9.9 years were enrolled in the study. 70 patients with elevated troponin T (>0.05 ng/ml) after DES implantation and 139 patients with normal troponin T (<0.05 ng/ml). After univariate analysis, we found that age, hypertension, total cholesterol, LDL-C, Gensini score, number of stenosed vessels and total implanted stents were associated with post-procedural troponin T elevation. According to the results of multivariate analysis, we found that age, total cholesterol, number of stenosed vessels and number of implanted stents were independent risk factors of post-procedural troponin Televation.

**Conclusions** Age, serum total cholesterol, number of stenosed vessels and number of implanted stents could be independent risk factors of troponin Televation after elective DES implantation.

**GW23-e1504  THE EFFECT OF DEPRESSION ON PREMATURE VENTRICULAR CONTRACTIONS (PVCs) IN CORONARY HEART DISEASE (CHD) PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION**

Wu Keng, Wu Keng. The Affiliated Hospital of Guang Dong Medical College

**Objectives** To determine whether Depression increases the incidence rate of premature ventricular contractions (PVCs) in CHD patients undergoing PCI.

**Methods** From November 1, 2010 and ended on October 30, 2011. 160 CHD patients from single center were assigned to either the depression or the non-depression group according a validated Chinese version of Beck Depression Inventory (BDI). PVCs was required Lown Classification. The primary end point was the occurrence of SCDs at 6 months, including ICD, Cardiopulmonary Resuscitation (CPR). Secondary end point was antiarrhythmic drug (AAD) administration.

**Results** At 3 months, PVCs (Lown I-IVA) and AAD administration rates were significantly different between the depression (33.7% and 43.5%) and the non-depression groups (15% and 17.5%, p<0.05). At 6-month, additional PVCs (Lown IVB-V) in the depression group (7.5%) in occurring significantly more than in the non-depression group (2.5%, p<0.05). There were nonsignificant differences in SCDs, CPR and ICD between the depression (5%, 2.5%and 3.8%) and non-depression groups (2.5%, 2.5% and 4%, p>0.05).

**Conclusions** Depression was associated with a significant increase of PVCs and AAD administration in this CHD patient population undergoing PCI. However, there was no significant difference in SCDs, CPR and ICD between the depression and the non-depression groups.

**GW23-e2698  THE GROUP BEHAVIOUR INTERVENTION; SMOKING CESSATION; THE ABSTINENCE RATE**

Yuhongxia Yuhongxia, Zhongnianzhuo

**Objectives** To study the smoking abstinence rate by a group behaviour intervention combine with varenicline.

**Methods** Smokers willing to make a quit attempt were randomly allocated, using varenicline combine with a group behaviour intervention smoking cessation programme, or to a control group that received varenicline only to quitting. The primary outcome was 12 weeks self-reported continuous smoking abstinence, biochemically verified by exhaled CO test at 3 months.

**Results** We assessed 52 participants for eligibility. Eight were excluded. 27 smokers were allocated to the group behaviour intervention and varenicline, another 25 smokers were allocated to the control group; More participants had quit at 4 weeks in the group behaviour intervention compared to the control group: 70.3% vs 52%, p>0.05; 62.9% vs 52% at 12 weeks, p<0.05. Reported quit rates remained high difference at 6 months, but there was some
uncertainty about between group differences because of incomplete follow up.

Conclusions he group behaviour intervention therapy will improve the quit rate with medicine. This study provide a new effective behaviour intervention way to help smokers to quit with medicine.

GW23-e2699  ACUTE MYOCARDIAL INFARCTION; EARLY REHABILITATION; CURATIVE EFFECT
doi:10.1136/heartjnl-2012-302920e.6
Zhangtianlin Zhangtianlin. Taikangxianyiyuan

Objectives To evaluate the early rehabilitation effects on acute myocardial infarction (AMI) through study of randomised comparison.

Methods 120 patients with AMI were categorised into 2 groups randomly. Contrast group and experiment group. The patients in experiment group increasing the amount of exercise regularly for 3 weeks; The patients in contrast group practice traditional nursing plan weekly. when experiment finished, left ventricular function, ventricular arrhythmia, exercise tolerance, incidence of thrombosis and embolism, hospitalisation were observed.

Results The maximum metabolism equivalent of exercise of experiment group higher than that of contrast group (p<0.01);incidence of ventricular arrhythmia above lown III less than that of contrast group (p<0.01);left ventricular ejection fraction improved.

Conclusions Early rehabilitation improves the prognosis in patients with AMI markedly and shorten hospitalisation.

GW23-e2185  ONE CASE OF SYSTEMIC LUPUS ERYTHEMATOSUS WITH PREMATURE CORONARY HEART DISEASE
doi:10.1136/heartjnl-2012-302920e.8
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Objectives 1. Clinical Data: The patient, female, is 39 years old, with pector-algia 2 month in hospital. She has ‘SLE’ for 10 years, used of prednisonum nearly 5 years.

Methods 2. Discussion: Coronary disease risk factors include traditional cardiovascular disease, hypertension or take drug for treating high blood pressure, diabetes and smoking, generation in the early history of coronary heart disease relatives, hyperlipidaemia, high-density lipoprotein (HDL) lower, low-density lipoprotein (LDL) higher and any always happens atherosclerosis related disease, body mass index more than 30 kg/m2, early onset of ovarian function failure, etc.

Results The patient is a young women, and feel typical ischaemic pain. The patients have no the traditional risk factors, but there are clear systemic lupus erythematosus (SLE) 10 years history, and long-term use of adrenal glucocorticoid. we assume that the patient is likely to be the cause of systemic lupus erythematosus (SLE) about change and or long-term hormone therapy with relevant. Related literature tip: SLE with atherosclerosis is happened by traditional risk factors except the influence. There are some such as lipid structure imbalance, drug therapy, high coagulant SLE disease related factors such as state influence. SLE patients atherosclerosis may have the pathogenesis of vascular endothelial injuries, chronic inflammation, resistance to the function of the heart phospholipids antibody, immune complex role, etc.

Conclusions Effect mechanism: Hormone therapy that has the effect of atherosclerosis, indirect effect of traditional and increase the atherosclerosis risk factors: blood alcohol levels, with the bravery of hypertension and obesity, etc. It is very important benefit to Prevalence of complications, influencing factors and mechanism of SLE.

GW23-e1474  THE CHANGES OF SERUM TESTOSTERONE IN INJURY OF HEART OF EXHAUSTIVE EXERCISED RATS
doi:10.1136/heartjnl-2012-302920e.9
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Objectives To study the changes of serum testosterone in heart injury of exhaustive rats, therefore provide information for
Lipid research

THE IMPLICATION OF CIGARETTE SMOKING AND SMOKING CESSATION ON MACROPHAGE CHOLESTEROL EFFLUX IN CORONARY ARTERY DISEASE PATIENTS

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Objectives Cigarette smoking is an independent risk factor for cardiovascular disease. The ATP-binding cassette transporters A1 (ABCA1) and G1 (ABCG1) mediated cholesterol efflux initiate reverse cholesterol transport and play a pivotal role in keeping lipid homeostasis of macrophage. Accordingly, we investigated the ABCA1 and ABCG1 expression and function in cholesterol efflux from macrophages of cigarette smoke exposure in coronary artery disease patients.

Methods This is a randomised, prospective and parallel controlled study. All the subjects, including 17 healthy non-smokers, 35 healthy chronic smokers and 32 CAD smokers, were recruited in Peking Union Medical College Hospital (PUMCH) (Beijing, China). Smoking subjects eligible for this study included individuals aged 40–80 years who smoked regularly for at least 10 years with at least 10 cigarettes/day. Smoking subjects were randomly assigned in a 1:1 ratio to either smoking cessation subgroup or continued smoking subgroup. Smokers randomised into smoking cessation subgroup were asked to stop smoking for at least 90 days. CAD smokers were asked to stop statin therapy for at least 2 weeks before randomised into subgroups. Cotinine concentration in urine and the carbon oxides (CO) of expiration were tested to insure the compliance of study. There were 14 healthy smokers and 13 CAD smokers finished 90 days smoking cessation. Blood samples were collected from all subjects. Peripheral blood monocyte cells were differentiated into macrophages, real time PCR and immunoblot were performed and cellular cellular cholesterol efflux were tested to evaluate ABCA1 and ABCG1 expression and function in macrophages from subjects.

Results We found that ABCA1 expression, as well as its function in mediating cholesterol efflux to apoa-1, was decreased in macrophages from both healthy and CAD smokers compared with those from non-smokers at the baseline. There was no obvious difference in ABCG1 expression in all three subgroups. Both HDL-cholesterol and apoA-1 levels were substantially lower in plasma from smoking subjects compared with that in non-smokers. ABCA1 expression and its function in mediating cholesterol efflux were reversed by 3 months smoking cessation in CAD subgroup. In contrast, ABCA1 expression and function were not apparently improved in healthy smoking subjects after 3 months tobacco cessation. ABCG1 expression did not change after smoking cessation in each group. ABCA1 mRNA and protein expression was disturbed by nicotine, rather than carbon monoxide. Mecamylamine which is a selective antagonist of α-7 nicotinic acetylcholine receptor (nAChR) abrogated nicotine induced inhibition of ABCA1.

Conclusions ABCA1 mediated intercellular cholesterol efflux is attenuated by chronic cigarette smoking. ABCA1 expression as well as its function could be reversed by 3 months tobacco abstinence in CAD patients. Nicotine induced down-regulation of ABCA1 expression can be abrogated by Mecamylamine.
Cholesterol was widely used as a tracer in cholesterol efflux assay, time- and labour-consuming assay procedure and radioactivity disposal procedure may limit its use in high-throughput screening. Here, we developed a new method using fluorescent NBD-cholesterol as a substitute for [3H]-cholesterol to measure cholesterol efflux in THP-1 derived macrophages.

**Methods** THP-1 cells were cultured in RPMI 1640 with 20% FBS, and differentiated into macrophages under incubation with 100 ng/ml of phorbol myristate acetate (PMA) for 72 h. NBD-cholesterol uptake and metabolism in THP-1 derived macrophages were characterised using fluorescent microscope and spectrophotometer. Cholesterol efflux in THP-1 derived macrophages was measured using either 22-NBD-cholesterol or [3H]-cholesterol as a tracer. The correlation data was obtained after compared percentage efflux of NBD-cholesterol with that of [3H]-cholesterol. NBD-cholesterol efflux was also measured in THP-1 cells compared with human peripheral blood mononuclear cells (PBMCs).

**Results** NBD-cholesterol distributed rapidly into cell organelles except nucleus. Uptake of NBD-cholesterol in THP-1 macrophages was concentration- and time-dependent, and reached a plateau after 4-h incubation. Next, we measured cholesterol efflux in THP-1 derived macrophages using either 22-NBD-cholesterol or [3H]-cholesterol as a tracer. The correlation data was obtained after compared percentage efflux of NBD-cholesterol with that of [3H]-cholesterol. Our results showed that percentage efflux of NBD-cholesterol was significantly correlated to that of [3H]-cholesterol using either apoA-1 or HDL as lipid acceptor (R²=0.882 for apoA-1, and R²=0.887 for HDL, respectively, p<0.001). Furthermore, NBD-cholesterol efflux in THP-1 cells showed similar trend with that in human peripheral blood mononuclear cells (PBMCs).

**Conclusions** Fluorescent NBD-cholesterol can be used as a sensitive and specific probe for cholesterol efflux assay in THP-1 derived macrophages.

**GW23-e01780** STUDY ON THE CORRELATION OF OVERWEIGHT AND OBESITY WITH HYPERTRIGLYCERIDAEMIA IN GANZHOU CITY AREA

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**Objectives** To comprehend the current distribution of overweight and obesity in Ganzhou city residents, and to investigate the association between overweight, obesity and hypertriglyceridaemia.

**Methods** 8000 residents from May to September 2011 in hospital for health examination were human subjects, and collected the data of height, body weight to account body mass index (BMI), and triglyceride concentration to do statistical analyses.

**Results** The prevalence of overweight and obesity people were 29.6% and 5.6%, and all the prevalence of overweight and obesity, male were 38.0% higher than female 33.1%, the difference was not statistically significant. (p>0.05). The prevalence of hypertriglyceridaemia in Ganzhou residents were 34.07%, male was 39.8%, female was 29.9%, and also male higher than female, there was no significant difference between the two groups (p>0.05). The overweight and obesity had different conditions in hypertriglyceridaemia group and normal group, and there were significant differences, had statistics significance (p<0.001). The obesity group had the highest triglyceride concentration, and the overweight group higher than the normal group.

**Conclusions** The prevalence of overweight and obesity are very high in the Ganzhou city residents, and overweight and obesity were the important risk factors for hypertriglyceridaemia. To prevent overweight and obesity could reduce the incidence rate of hypertriglyceridaemia.

**GW23-e0945** AGE- AND GENDER-SPECIFIC ASSOCIATION BETWEEN METABOLIC SYNDROME COMPONENTS AND SUBCLINICAL ARTERIAL STIFFNESS IN A CHINESE POPULATION

doi:10.1136/heartjnl-2012-302920f.4

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**Objectives** Cardiovascular diseases (CVD) are major cause of mortality and morbidity globally. Atherosclerosis, as an underlying cause of most of CVD events, is usually present before clinical manifestation of CVD. Brachial-ankle pulse wave velocity (baPWV) is a measurement interpreted as atherosclerosis. The aim of this study was to analyse the relationship between baPWV, and components of metabolic syndrome (MetS) in different age and gender groups.

**Methods** We examined 12900 Chinese adults aged 20–79 years and categorised according to gender and age. All participants underwent examinations, including, waist circumference, blood pressure, baPWV, and blood chemistry. Multiple linear regression analyses were performed to evaluate the relationship between baPWV and these variables as well as to determine the relative influence of each component of MetS.

**Results** Men showed significant greater baPWV than women in young and middle-aged adults but not in elderly adults. Systolic blood pressure was positively associated with baPWV in most groups, whereas diastolic blood pressure was positively associated with baPWV only in young and middle-aged men and young women, waist circumference had a positive association with baPWV in elderly men and middle-aged women, fasting glucose levels showed a significant association with high baPWV in middle-aged and elderly adults, but high-density lipoprotein was not significantly associated with any groups. All participants with MetS or any component of MetS had higher baPWV levels, with blood pressure being the strongest predictor.

**Conclusions** The association between baPWV and metabolic variables is age- and gender-specific. Each component of MetS has a distinct impact on the baPWV in individual age- and gender-specific groups. The present results may allow specialists to manage metabolic disorders considering gender and age difference for artery stiffness improvement.

**GW23-e0998** ASSOCIATION BETWEEN IMPAIRED GLUCOSE REGULATION AND HEART RATE TURBULENCE

doi:10.1136/heartjnl-2012-302920f.5

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**Objectives** To explore the association between impaired glucose regulation and heart rate turbulence.

**Methods** According to the results of oral glucose tolerance test and the guide of International Diabetes Federation in 2007, 254 cases of participant were divided into three groups, namely control group, impaired glucose regulation group and new diagnosed diabetes group. 24 h Holter was performed in all participants.

**Results** Although turbulence onset and 24 h total number of premature ventricular contraction were lower, and turbulence slope
and the SDs of all normal RR intervals were higher in impaired glucose regulation group than those in new diagnosed diabetes group (p<0.05, respectively), turbulence onset and 24 h total number of premature ventricular contraction were significant elevated, and turbulence slope and the SDs of all normal RR intervals were remarkable decreased in impaired glucose regulation group compared with control group (p<0.05, respectively). Pearson analysis shown, fasting glucose levels positively correlated with turbulence onset and 24 h total number of premature ventricular contraction (correlation coefficient were 0.5347 and 0.3419, p<0.001, respectively), and negatively correlated with turbulence slope and the SDs of all normal RR intervals (correlation coefficient were −0.4635 and −0.5682, p<0.001, respectively).

Conclusions There was correlation between impaired glucose regulation and heart rate turbulence. Function of cardiac autonomic nervous system has impaired in subjects with impaired glucose regulation.

The non-invasive EZSCAN test is an effective screening tool of glucose dysfunction for ethnic Chinese. For this population, the cutoff points for optimal detection of IGT and diabetes are 37% and 50%, respectively.

GW23-e1152 EZSCAN SCREENING OF IMPAIRED GLUCOSE TOLERANCE AND DIABETES IN A CHINESE POPULATION doi:10.1136/heartjnl-2012-302920f.6

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Objectives EZSCAN (Impeto Medical, Paris, France), a non-invasive technology that evaluates sweat gland dysfunction through electro-chemical skin conductance (ESC) measurement, is a promising new approach for detecting and quantitating impaired glucose tolerance (IGT) and diabetes risk. This cross-sectional study was designed to determine the efficacy and cutoff points of EZSCAN for diagnosing IGT and diabetes in a Chinese population, as compared to traditional blood and plasma glucose tests.

Methods Two-hundred and seventy individuals were recruited for the study during routine check-up appointments at Xianghe Community Hospital. All subjects underwent oral glucose tolerance test (OGTT), haemoglobin A1c (HbA1c) test, fasting plasma glucose (FPG) test, and EZSCAN. Test results were used to classify subjects as normal glucose tolerance, IGT, or newly diagnosed diabetes, according to 1999 WHO criteria. Spearman correlations were used to identify the agreement between EZSCAN and blood/plasma glucose tests. A receiver operating characteristic (ROC) curve was used to evaluate the diagnostic properties of EZSCAN for IGT and diabetes.

Results Forty (14.8%) subjects were newly diagnosed with diabetes, while 79 (29.3%) had IGT and 151 (55.9%) had normal glucose tolerance. The value of EZSCAN measurement were 34±13%, 47±11% and 48±11% in normal glucose tolerance subjects, IGT, and newly diagnosed diabetes subjects respectively. For the total population, the correlation coefficient between EZSCAN and OGTT was 0.462 (p<0.001), between EZSCAN and FPG was 0.182 (p<0.001), and between EZSCAN and HbA1c was 0.379 (p<0.001). The cutoff point for EZSCAN detection of IGT was 37% (sensitivity=87%, specificity=62%, area under curve (AUC) =0.769), and the cutoff point for newly diagnosed diabetes was 50% (sensitivity=53%, specificity=59%, AUC=0.528).

Conclusions The non-invasive EZSCAN test is an effective screening tool of glucose dysfunction for ethnic Chinese. For this population, the EZSCAN cutoff points for optimal detection of IGT and diabetes are 37% and 50%, respectively.

GW23-e2083 SILDENAFIL PLUS UNDECANOATE AND SILDENAFIL ALONE IN THE TREATMENT OF TYPE 2 DIABETIC PATIENTS WITH ERECTILE DYSFUNCTION doi:10.1136/heartjnl-2012-302920g.2

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Objectives The aims of the present study were to examine whether the anthropometric measures could predict diabetes incidence in a Chinese population during a 15-years follow-up.

Methods The data were collected in 1992 and then again in 2007 from the same group of 687 employees. Waist circumference, body mass index, waist to hip ratio and waist to height ratio were collected base on a standard protocol. To assess the effects of baseline anthropometric measures on the new onset of diabetes, logistic regression models were used to estimate the ORs of them, and the discriminatory power of anthropometric measures for diabetes was assessed by the area under the receiver operating curve (AROC).

Results Of the 687 individuals without diabetes at baseline, 74 individuals were diagnosed with diabetes during a 15-year follow-up period (incidence 10.8%). These anthropometric measures also predicted future diabetes during a long follow-up (p<0.001). The areas under the ROC curves were 0.668 (95% CI 0.601 to 0.734) for BMI, 0.701 (95% CI 0.641 to 0.760) for WC, 0.693 (95% CI 0.637 to 0.748) for WHpR and 0.716 (95% CI 0.657 to 0.774) for WHtR, respectively (all p<0.001).

Conclusions These anthropometric measures could predict diabetes with different duration of follow-up time. They should be recommended in most clinical practices.

GW23-e1181 AS TIME GOES BY, ARE ANTHROPOMETRIC MEASURES STILL PREDICTORS OF DIABETES INCIDENCE? doi:10.1136/heartjnl-2012-302920g.1

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Objectives The aims of the present study were to examine whether the anthropometric measures could predict diabetes incidence in a Chinese population during a 15-years follow-up.

Methods The data were collected in 1992 and then again in 2007 from the same group of 687 employees. Waist circumference, body mass index, waist to hip ratio and waist to height ratio were collected base on a standard protocol. To assess the effects of baseline anthropometric measures on the new onset of diabetes, logistic regression models were used to estimate the ORs of them, and the discriminatory power of anthropometric measures for diabetes was assessed by the area under the receiver operating curve (AROC).

Results Of the 687 individuals without diabetes at baseline, 74 individuals were diagnosed with diabetes during a 15-year follow-up period (incidence 10.8%). These anthropometric measures also predicted future diabetes during a long follow-up (p<0.001). The areas under the ROC curves were 0.668 (95% CI 0.601 to 0.734) for BMI, 0.701 (95% CI 0.641 to 0.760) for WC, 0.693 (95% CI 0.637 to 0.748) for WHpR and 0.716 (95% CI 0.657 to 0.774) for WHtR, respectively (all p<0.001).

Conclusions These anthropometric measures could predict diabetes with different duration of follow-up time. They should be recommended in most clinical practices.
Conclusions Undecanoate combined with Sildenafil maybe more effective to improve the erectile function than Sildenafil alone in Type 2 diabetic patients with erectile dysfunction.

GW23-e2178  **HS-CRP AND TRADITIONAL RISK FACTORS: WHO IS STILL SIGNIFICANTLY ASSOCIATED WITH DIABETES IN CHINESE OLDEST-OLD?**

doi:10.1136/heartjnl-2012-302920g.3

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Objectives Increasingly more studies have shown that high sensitivity C-reactive protein (hs-CRP) is related to diabetes in adults; thus, hs-CRP is thought to be a new emerging risk factor for cardiovascular disease, and diabetes. In addition, there are studies suggesting that the predictive value of classic risk factors diminish with advancing age; these results are controversial, and to our knowledge, few studies have explored the association of hs-CRP and diabetes in the oldest old. This study aimed to address the knowledge gap through analysis of the association of traditional risk factors and hs-CRP with diabetes among a group of Chinese oldest old.

Methods 1603 participants in the fifth wave of the Chinese Longitudinal Healthy Longevity Study (CLHLS) from five longevity areas were invited to participate in this sub-study; based on availability of hs-CRP and other related data, 522 subjects aged 80 and older were included in the sample. Information was collected related to demographics (age, sex, nationality, marriage, and education), lifestyle (smoking status, drinking status, and physical activity), and self-reported chronic diseases, including diabetes and hypertension. Measurements of waist circumstance, diastolic blood pressure and systolic blood pressure were performed. High sensitive C reactive protein (hs-CRP), total cholesterol (TC), triglycerides (TG) and fasting plasma glucose (FPG) were tested in a certified laboratory in Beijing. The subjects were classed into two groups according to the prevalence of diabetes (a positive self-report or a plasma glucose of above 7.0 mmol/l was considered to be diabetic). Student’s t-test was used to compare the basic characteristics and clinical biochemical indices. Logistic regression was used to analyse the association of hs-CRP and traditional risk factors of diabetes (including age, smoking status, drinking status, physical activity, central obesity, total cholesterol, triglycerides). Also multivariable linear regression was fit to explore the relation of hs-CRP and traditional risk factors with FPG.

Results Compared with the non-diabetic group, plasma hs-CRP concentrations in the diabetic group were significantly higher (median value 1.95 mg/l, p<0.05). The percentage of high hs-CRP subjects (hs-CRP level above 75th percentile, that is no less than 4.52 mg/l) was also significantly higher (p<0.05) in the diabetic group (34.85% in the diabetic group vs 23.64% in the non-diabetic group). The traditional risk factors for diabetes were not significantly different (p>0.05) in the two groups. Logistic regression analysis showed that hs-CRP was significantly positively associated with diabetes (p<0.05) after adjusting for demographic variables (sex, nationality, marriage, education) and hypertension. The odds of diabetes increased with increased concentrations of hs-CRP; with OR (95% CI) value was 1.87 (1.05, 3.31). In contrast, the traditional risk factors mentioned above were not significantly associated with diabetes except for TG; the OR (95% CI) value for age, smoking status, drinking status, physical activity, central obesity, total cholesterol, TG was 0.99 (0.94, 1.04), 1.77 (0.89, 3.50), 0.86 (0.40, 1.85), 0.77 (0.41, 1.43), 1.28 (0.73, 2.25), 0.79 (0.59, 1.06), 1.84 (1.11, 3.03), respectively. Adjusting for demographic variables, systolic blood pressure and diastolic blood pressure in multivariable linear regression models, hs-CRP was positively associated with FPG, with the coefficient was 0.03 (p<0.01); in contrast, in adjusted multivariable models, traditional risk factors, with the exception of TG (the coefficient was 0.62, p<0.01), were not associated with diabetes.

Conclusions In contrast to traditional risk factors of diabetes except TG, hs-CRP is significantly and independently associated with diabetes in the Chinese oldest-old.

GW23-e1180  **ESTIMATED 15-YEAR RATES OF PROGRESSION TO OBESITY IN A GENERAL CHINESE POPULATION**

doi:10.1136/heartjnl-2012-302920h.1

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Objectives To assess the 15-year rates of progression to obesity in a general Chinese population without obesity at baseline.

Methods In 2007, a health examination was performed in 711 individuals for cardiovascular disease (CVD) risk factors in an urban community located in Chengdu, Sichuan province, China. These individuals also accepted a health examination in 1992 for CVD risk factors; therefore, we picked up the data of these individuals in 1992. Since 52 individuals had underweight or obesity in 1992, 659 individuals were available for analysis. The incidence of obesity was studied in the initial normal BMI group and the initial overweight group.

Results At the end of follow-up, the initial overweight group had significantly more individuals progressing to obesity than the initial normal BMI group (15.1% vs 0.5%, p<0.001). The initial overweight group, as compared with the initial normal BMI group, had an increased risk of obesity (OR, 20.231, 95% CI 4.407 to 92.874, p<0.001). On the other hand, the initial overweight group always had higher levels of cardiovascular disease (CVD) risk factors. The 15-year rates of progression to obesity exceeded 15.0% in the initial overweight group, accompanied by more CVD risk factors.

Conclusions The estimates suggest that the future burden of obesity-associated CVD might be substantial in the initial overweight group. For preventing or delaying obesity and interrelated CVD from developing, the overweight group should accept early interventions.

GW23-e1164  **EFFECTS OF METFORMIN ON THE BLOOD LIPID PROFILE AND INSULIN SENSITIVITY IN OBESE WOMEN WITH POLYCYSTIC OVARY SYNDROME**

doi:10.1136/heartjnl-2012-302920h.2

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Objectives To evaluate the effects of 3 months of metformin therapy on various blood lipid factors and insulin sensitivity in obese women with PCOS.
Methods Seventeen obese PCOS women (body mass index (BMI) ≥24 kg/m²), aged 20–36 years, were included in the study from the department of infertility and sexual medicine at the Third Affiliated Hospital of Sun Yat-Sen University between February 2011 and December 2011. The hormonal and metabolic parameters, including sexual hormone levels, glucose, insulin, and fasting lipids levels, were evaluated before treatment. Metformin (1500 mg/day) was administered for 3 months. After 3 months of therapy, they were re-sample.

Results BMI were significantly decreased after 3 months of metformin treatment (25.52±3.51 vs 22.45±3.72, p<0.05). Serum total cholesterol (5.03±0.98 vs 4.70±0.75, p<0.05), triglycerides (1.81±0.97 vs 1.68±0.78, p<0.05), and serum testosterone (2.86±0.52 vs 1.76±0.45, p<0.05) were all reduced. Insulin resistance measured by homeostasis model assessment (HOMA) method was significantly decreased (4.51±0.68 vs 4.01±0.49, p<0.05).

Conclusions Metformin therapy is effective in improving insulin sensitivity and some cardiovascular risk biomarkers in obese women with PCOS.

GW23-e1165 RELATIONSHIP BETWEEN OBESITY AND MENSTRUAL DISTURBANCES AMONG WOMEN OF REPRODUCTIVE AGE doi:10.1136/heartjnl-2012-302920h.3

Erhong Zhang, Xiaoyan Li, Bin Zhang, Liu-hong Cai, Xin Tao, Weijie Xing, Xin Tao. The Third Affiliated Hospital of Sun Yat-Sen University

Objectives To evaluate the association between obesity and menstrual cycle characteristics among women of reproductive age.

Methods 236 women aged 18–41 years who were not taking hormonal contraceptives were included in the study. These women were required from the department of infertility and sexual medicine at the Third Affiliated Hospital of Sun Yat-Sen University between February 2011 and February 2012. Menstrual cycle characteristics were self-reported and usual cycles defined as regular cycles (between 22 and 35 days and not varying in length by more than 2–3 days each months). The other Cycles were defined as irregular. The following were evaluated: body weight, height, body mass index, waist circumference, hip circumference, waist-hip ratio (WHR), menstrual cycle, blood pressure, fasting glycaemia, total testosterone (T), insulin and the Homeostasis Model Assessment (HOMA) test.

Results The rate of menstrual disturbances was higher in obesity group (8/25, 32% BMI ≥24 kg/m²) than that in non-obese group (26/211, 12.32%). Women with high central adiposity defined by WHR≥0.8 were more likely to have a long cycle compared with their reference groups. HOMA test values (3.68±1.42 vs 2.63±1.02, p<0.05) in obesity group were significantly decreased (4.51±0.68 vs 4.01±0.49, p<0.05).

Conclusions Nearly half of Shandong adult residents are overweight or obesity. Overweight and obesity have become important public health problems in Shandong province and they are major risk factors to cause hypertension. Health education and health promotion should be strengthened to prevent and control overweight and obesity.

GW23-e1515 ASSOCIATION OF SOCS3 GENE POLYMORPHISMS WITH OVERWEIGHT AND OBESITY IN UYGUR POPULATION IN XINJIANG HETIAN AREA OF CHINA doi:10.1136/heartjnl-2012-302920h.5

Lin Na, Yan Xiao-guang, Zhou Ling, Wang Hong-mei, Hong Jing, Li Nan-fang, Li Nanfang, Hypertension Center of The People’s Hospital Of Xinjiang Uygur Autonomous Region

Objectives To explore the relationship between suppressor of cytokine signalling 3 (SOCS3) genetic polymorphisms and overweight and obesity in Uygur Chinese general population in Xinjiang.

Methods 1407 Uygur individuals were enrolled (530 males, 876 females). The 3 single nucleotide polymorphisms (rs4949169, rs9914220, rs12953258) in SOCS3 gene were selected. Measure the height, weight, waist and hip circumference, calculate body mass index (BMI).

Results (1) Significant association was found between rs4949169 and the overweight, obesity in males, BMI (GG : AG : AA : GA : AA : GA : GA : GG : GA : GG : GG) was 26.44 ±4.16 kg/m² vs 27.23±4.34 kg/m² vs 27.78±4.45 kg/m², p=0.042. Rs 991 4220 was associated with overweight and obesity in Uygur females in Xinjiang HETIAN area. But rs12953258 was not associated with overweight and obesity in Xinjiang HETIAN area.

Conclusions SOCS3 gene was significant associated with overweight and obesity in Uygur population in Xinjiang HETIAN area, and SOCS3 gene associated with overweight and obesity express distinctive in different gender.

GW23-e2968 A STUDY ON THE EPIDEMIOLOGICAL CHARACTERISTICS OF OVERWEIGHT AND OBESITY AND ITS RELATIONSHIP WITH THE HYPERTENSION AMONG ADULT RESIDENTS IN SHANDONG PROVINCE doi:10.1136/heartjnl-2012-302920h.4

Dong Jing, Guo Xiaolei, Zhang Jiuy, Tang Junli, Lu Zhong, Chu Jie, Xu Aiqiang, Shandong Center for Disease Control and Prevention; Shandong Center for Disease Control and Prevention

Objectives To describe the epidemiological distribution of overweight and obesity and explore its relationship with hypertension among adult residents in Shandong province.

Methods A cross-sectional survey was conducted among 15,350 permanent residents aged between 18–69 years old with stratified multistage sampling during July to August 2011, in Shandong province. All participants were interviewed with a standard questionnaire. Anthropometric indicators including height, weight and waist circumference (WC) were measured.

Results The general prevalence rate of overweight, obesity and central obesity was 32.77%, 16.60% and 50.33% among adult residents in Shandong province. There is no difference of the epidemiological distribution between different groups classified by gender, region and city. The average levels of blood pressure gradually increased with the increasing of BMI and WC, while the rate of hypertension also increased. The prevalence rate of hypertension was 8.56%, 13.42% and 28.20% among normal BMI, overweight and obesity people. After adjusting age and gender, the prevalence rates were 2.34 times and 5.92 times higher among overweight and obesity people than those among normal BMI people.

Conclusions Overweight and obesity have become important public health problems in Shandong province and they are major risk factors to cause hypertension. Health education and health promotion should be strengthened to prevent and control overweight and obesity.

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Conclusions Nearly half of Shandong adult residents are overweight or obesity. Overweight and obesity have become important public health problems in Shandong province and they are major risk factors to cause hypertension. Health education and health promotion should be strengthened to prevent and control overweight and obesity.
Sports Medicine and Rehabilitation

**THE CLINICAL STUDY OF EXHAUSTIVE HEART DAMAGE IN A MILITARY REGION FOR TRAINING STAFF**

Caoxuebin Wangxiaowei. No.252 Hospital of PLA

**Objective**

This study through a retrospective analysis of clinical data of patients with exhaustive exercise in Beijing Military Region, summarises the clinical features of exhaustive exercise-induced cardiac injury, to explore the high sensitivity and specificity of simple, fast detection of indicators, preliminary study its pathogenesis and clinical classification, to improve clinical awareness and diagnosis and treatment of disease, provide a theoretical basis for the scientific training facilities.

**Methods**

Six military hospitals to collect a Military General for the past 10 years due to the clinical data of exhaustive exercise pathogenic cardiovascular medical inpatients, clinical data and blood, urine, renal function, serum enzymes and laboratory markers and electrocardiogram, ambulatory electrocardiogram, cardiac ultrasound test indicators were analysed retrospectively.

**Results**

1. In general: this study collected 137 cases of exhaustive cases of heart damage in 3–10 km cross-country, physical training, military training incidence, accounting for 5.31% of the cardiovascular medicine during the same period the number of hospitalised soldiers. Exhaustive heart damage common symptoms of chest tightness, palpitations, chest pain, dizziness, shortness of breath, syncope; abnormal signs of mainly for cardiac auscultation abnormalities, such as arrhythmia, premature contraction, bradycardia, and so on.

2. Laboratory markers: The abnormal increase of 21 cases of blood after recovery compared with the incidence of admission white blood cell, neutrophil values down significantly (p<0.01); haemoglobin also declined, but not statistically significant. 13 cases the urine suggests the presence of varying degrees of haematuria and proteinuria. Discharged from a rest and symptomatic treatment have returned to normal. 21 cases of abnormal renal function, urea, creatinine, uric acid have different degrees, of which 14 cases manifested as hyperuricaemia. Comparison of onset time of admission and after recovery of renal function after recovery of urea, creatinine, uric acid levels were decreased (p<0.01 or 0.05). Serum enzyme abnormalities in 71 cases, the proportion is as high as 51.8%. Comparison of the incidence after admission and after rehabilitation of the serum enzyme recovered ALT, AST, a-HBDH, LDH, CK and CK-MB were significantly decreased, the difference was statistically significant (p<0.01 or 0.05). Exhaustive exercise can lead to elevated serum enzymes, increased in multiples of more than 1 to 5 times of CK and CK-MB ratio of about 29±3:1.

3. Check indicators: ECG abnormalities in 94 cases, the proportion of cardiopulmonary exercise test (CPET) and in aerobic exercise prescription from the individually-based results and clinical diagnostic habits, exhaustive heart damage is the most direct evidence of the Exhaustive heart damage, blood, urine, and renal dynamic changes exhaustive exercise result in body injury strong evidence.

**Conclusions**

1. Exhaustive heart damage in this special population of the army commanders and soldiers have a higher incidence. The common symptoms of chest tightness, palpitations, chest pain, dizziness, shortness of breath, syncope; abnormal signs of mainly cardiac auscultation abnormalities, such as arrhythmia, contraction, bradycardia, and so on.

2. Indicators of blood, urine, renal function, serum enzymes, electrocardiogram, ultrasound contrast non-exhaustive state with after acute exhaustive exercise, the more obvious exceptions, through rest, treatment it will return to normal. Exhaustive exercise can cause multiple organ damage, in addition to the heart to the kidney is the most obvious.

3. Serum enzyme abnormalities increased after exhaustive exercise, the dynamic changes in ECG and cardiac ultrasound are the most direct evidence of the Exhaustive heart damage, blood, urine, and renal dynamic changes exhaustive exercise result in body injury strong evidence.

4. Because CK-MB, cTnT high specificity to detect simple and cheap reagent, widely used clinical markers to identify myocardial damage better.

5. According to the clinical manifestations and laboratory test results and clinical diagnostic habits, exhaustive heart damage is preliminarily divided into the following four type: (1) simple type; (2) arrhythmia type; (3) heart failure type; (4) sudden death type.

**EFFECTS OF EXERCISE THERAPY AT THE INTENSITY OF ANAEROBIC THRESHOLD FOR CARDIOPULMONARY FUNCTION IN PATIENTS WITH AMI AFTER PERCUTANEOUS CORONARY INTERVENTION**

Lin Che, Lemin Wang. Tongji Hospital, Tongji University

**Objective**

The purpose is to investigate the feasibility and safety of aerobic exercise prescription from the individually-based results of cardiopulmonary exercise test (CPET) and influence of aerobic exercise training for cardiopulmonary function in patients with acute myocardial infarction (AMI) after percutaneous coronary intervention (PCI).

**Methods**

147 consecutive patients with AMI after PCI were divided into exercise group and control group, who finished twice times CPET and followed their rehabilitation programme for 3 months. Patients in the exercise group finished their aerobic exercise therapy based on their individually anaerobic threshold. CPET was measured at the time of discharge, at the end of 3 months, including ventilatory response to exercise and cardiac output changes during exercise.

**Results**

Their heart rate at AT intensity [92±10 beat min⁻¹] was lower than their traditional minimal target heart rate [105±6 β·min⁻¹] following the exercise test. The abnormal CO response at exercising was found in 38.7% patients with AMI after PCI, which the CO was maxim when exercising at AT (anaerobic threshold) load and was decreasing after the load was far exceeded the AT load. The O₂ consumption (14.0±4.0 ml min⁻¹ kg⁻¹ and 20.0±4.0 ml min⁻¹ kg⁻¹) and workload (64.2±20.2J s⁻¹ and 91.0 ±15.3J s⁻¹) at peak level and the O₂ consumption (10.1±2.4 ml min⁻¹ kg⁻¹ and 12.6±2.9 ml min⁻¹ kg⁻¹) and workload (35.4 ±18.6J s⁻¹ and 42.7±16.8J s⁻¹) at AT level markedly increased than before 3 months in exercise group, and the O₂ consumption (14.9 ±3.1 ml min⁻¹ kg⁻¹ and 18.3±2.0 ml min⁻¹ kg⁻¹) and workload (64.7±23.2J s⁻¹ and 79.2±16.1J s⁻¹) at peak level increased than before 3 months in control group, but their O₂ consumption (10.7 ±1.3 ml min⁻¹ kg⁻¹ and 12.2±1.1 ml min⁻¹ kg⁻¹) and workload (31.9±10.3J s⁻¹ and 36.9±8.1J s⁻¹) at AT level decreased as before 3 months in control group.
which is safe and effective and should be better recommended for
and exercise endurance and correct abnormal exercise CO response,
the intensity of anaerobic threshold can improve oxygen capacity
which is basis of aerobic exercise prescription. Exercise therapy at
relearning therapy based on Bobath
hemiplegic patients. Sex and age differences of the two groups
45 to 65 and average age (54.9±9.6), course of disease being (14.1
treatment group has 29 patients, 15 male and 14 female, age from
patients and 18 right hemiplegic patients. Regular rehabilitation
of disease being (13.2±10.3) days and 11 being left hemiplegic
groups. Early walking training group has 29 patients, 16 male and
March, 2010 to April, 2012, and randomly dividing them into two
Methods
Applying SPSS 13.0 to analyse data, taking
Category (FAC); (3) Activities of Daily Life Barthel Index Scale.
Assessment Scale (Lower limb part); (2) Functional Ambulation
treatment and 4 weeks after treatment respectively: (1) Fugl-Meyer
people: selected patients are made following evaluations before
4 weeks as one course for each group. Blind evaluation by certain
Results
Observing the in
motor relearning programme.
Methods
Observing the influence of early walking training to stroke hemiplegic patients’ lower limb motor function according to motor relearning programme.
Objectives
Methods
Objectives
Comparing the difference in early walking training group and control group, taking t test for enumeration data, 2 to enumeration data,
Assessment
GW23-e2016
INFLUENCE OF EARLY WALKING TRAINING TO STROKE HEMIPLEGIC PATIENTS’ LOWER LIMB MOTOR FUNCTION
doi:10.1136/heartjnl-2012-302920j.3
Wen-yu Xu, Yu-ping Su, Xin Liu, Kuo Li, Hai-yan Wang, Yi Su, Wen-yu Xu. The First Hospital of Qinhuangdao
Objectives
Observing the influence of early walking training to stroke hemiplegic patients’ lower limb motor function according to motor relearning programme.
Methods
Selecting 58 stroke hemiplegic patients hospitalised in the Rehabilitation Medical Centre of Qinhuangdao First Hospital from March, 2010 to April, 2012, and randomly dividing them into two groups. Early walking training group has 29 patients, 16 male and 13 female, age from 47 to 68 and average age (54.2±10.5), course of disease being (13.2±10.3) days and 11 being left hemiplegic patients and 18 right hemiplegic patients. Regular rehabilitation treatment group has 29 patients, 15 male and 14 female, age from 45 to 65 and average age (54.9±9.6), course of disease being (14.1±11.8) days and 13 being left hemiplegic patients and 18 right hemiplegic patients. Sex and age differences of the two groups have no statistical significance. Regular rehabilitation treatment group: mainly applying nerve facilitation technique and motor relearning therapy based on Bobath’s technique. Early walking training group: adding early functional walking training based on regular rehabilitation treatment. Once a day, 40 min each time and 4 weeks as one course for each group. Blind evaluation by certain people: selected patients are made following evaluations before treatment and 4 weeks after treatment respectively: (1) Fugl-Meyer Assessment Scale (Lower limb part); (2) Functional Ambulation Category (FAC); (3) Activities of Daily Life Barthel Index Scale. Applying SPSS 13.0 to analyse data, taking χ² to enumeration data, taking group t-test for comparison between two groups and paired t-test for comparison between before-treatment and after-treatment. p<0.05 means the difference has no statistical significance.
Results
The before-treatment differences of the paralytic lower limb motor function, walking function (FAC) and activities of daily life (Barthel index) of the two groups have no statistical significance. After 4 weeks’ treatment, the paralytic Fugl-Meyer assessment scale score, FAC score and Barthel index score of the two groups have significant improvement (p<0.05) and the improvement of early walking training group is more significant than that of regular rehabilitation treatment group (p<0.05).
Conclusions
Early developing functional walking training based on regular rehabilitation can effectively improve the walking function and daily life ability.

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Methods
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randomised to CSWT (200 shots/spot at 0.09 mJ/mm² for 9–16 spots, 9 times within 3 month/series, n=18) and control group (exactly 9 times within 3 months, n=18) and control group (exactly 9 times within 3 months, n=18). Dual isotope simultaneous acquisition single-photon emission CT with ⁹⁹m Tc-

GW23-e1080 META-ANALYSIS OF TRIPLE VERSUS DOUBLE THERAPY AFTER PCI WITH STENT IMPLANTATION IN PATIENTS ON CHRONIC ORAL ANTICOAGULATION

doi:10.1136/heartjnl-2012-302920j.3
Deng Bingqing, Nie Ruqiong, Sun yat-sen Memorial Hospital, Sun Yat-Sen University

Objectives The goal of this meta-analysis is to perform statistical analysis of published articles and trials performed in different case series to compare the benefits and risks of triple therapy (aspirin, clopidogrel and warfarin) with double therapy (aspirin and clopidogrel) after PCI-S in patients with an indication of chronic oral anticoagulation.

Methods We searched electronic and printed sources using Medline, Embase, Cochrane Library, PubMed, Ovid sp, Elsevier science direct and different research works from different published journals in the world published before November 2011 that compare triple anti-thrombotic therapy with double antiplatelet therapy after stent implantation in patients with an indication of chronic oral anticoagulation. Studies were included if they meet the predefined inclusion criteria. Two investigators independently extracted data from published reports by use of a standardised protocol and reporting form.

Statistical analysis was performed by using RevMan 5.1.4 freeeware package programme (The Cochrane Collaboration, Oxford, uk). Data were expressed as ORs and 95% 95% CI for the predetermined end points using Mantel-Haenszel method. Pooled ORs were reported with 95% CIs, and a two tailed p<0.05 was considered statistically significant for the overall treatment effect of all analysis.

Results 1. We retrieved 14 reports of studies including a total of 6 651 patients. Baseline characteristics were similar in both groups. We could compare data for 10 clinical outcomes. 1. Patients with triple therapy regimen was associated with significant reduction in stent thrombosis (OR 0.39, 95% CI 0.17 to 0.88, p=0.02) and stroke (OR 0.44; 95% CI 0.20 to 0.97, p=0.04) as compared to double therapy. 2. As compared to double therapy, triple therapy significantly increased the risk of major bleeding (OR 2.78, 95% CI 1.67 to 4.63, p<0.0001), minor bleeding (OR 1.81; 95% CI 1.30 to 2.53, p=0.0005) and GI bleeding (OR 2.96; 95% CI 1.65 to 5.32, p=0.0005). 3. The overall incidence of MACES (OR 0.73; 95% CI 0.47 to 1.14; p=0.17), MI or reinfraction (OR 0.71; 95% CI 0.48 to 1.05; p=0.09), TVR (OR 1.00; 95% CI 0.61 to 1.64; p=0.99) and all cause death (OR 1.05; 95% CI 0.59 to 1.85; p=0.88), was comparable between the two regimes. There was, however a trend toward a higher incidence of MACES and MI in double therapy. 4. There is no significant difference between two regimes for Net adverse cardiovascular events (NACEs) (OR 0.99; 95% CI 0.57 to 1.73; p=0.97).

Conclusions Our study suggest that triple therapy is efficacious in reducing the stent thrombosis and stroke in PCI-S patients with an indication of chronic OAC, compared with double therapy but may increase the risk of bleeding complication significantly. It also points out that triple therapy is currently the best option for the majority of patients, especially those with a higher risk thrombotic events and a lower risk of bleeding events. It is imperative that further prospective randomised controlled trials are required to define the best therapeutic strategy for patients with an indication of chronic OAC undergoing PCI-S. In the absence of meaningful randomised data, triple therapy should probably be individualised, weighing the risk of bleeding and ischaemic complication.
Methods A total of 600 patients undergoing primary PCI randomly received a personalised antiplatelet therapy (group A; n=301) or conventional antiplatelet treatment (group B; n=299). For group A, antiplatelet therapy was performed according to CYP2C19 phenotype. For group B, the patients received conventional antiplatelet treatment without detected CYP2C19 genotype. The primary endpoint was the incidence of ST within 180 days following PCI. The secondary end point was other adverse clinical outcomes including MI, death and bleeding events within 180 days after the procedure.

Results The cumulative 180-day incidence of ST was significantly lower in group A than that in group B (0.66% vs 3.01%, p=0.032). The 180-day incidence of MI (0.33% vs 3.01%, p=0.011) and death (0.33% vs 2.54%, p=0.011) was fewer than those in control, respectively. We did not find the significant difference in bleeding events between the 2 groups.

Conclusions Personalised antiplatelet therapy according to CYP2C19 Genotype after PCI can significantly decrease risk of 180-day ST and major adverse cardiovascular events in Chinese population.

GW23-e2676  COMPARISON OF TIMI, PURSUIT AND GRACE RISK SCORES IN PATIENTS PRESENTING EMERGENCY DEPARTMENT WITH NON-ST-ELEVATION ACUTE CORONARY SYNDROME

doi:10.1136/heartjnl-2012-302920j.6

Dai Xuan, Hu Chun-hun, Li Xin, Dong De-kun, Wei Hong -Yan, Liao Xiao-xing, Zhan Hong. Department of Emergency, The First Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510080, China

Objectives Risk stratification for patients with non-ST-elevation acute coronary syndrome (NSTE-ACS) is a difficult challenge for physicians. This study was to compare the prognostic value of three clinical risk scores, the GRACE, PURSUIT and TIMI score in NSTE-ACS patients.

Methods Pub Med was systematically searched for the TIMI, PURSUIT and GRACE risk score studies, especially the UA/NSTEMI studies. 8 eligible studies with 25 247 people were formally appraised. The GRACE scores, PURSUIT scores and TIMI score were subsequently divided into low, intermediate and high equivalent strata to facilitate comparison. The study endpoint was cardiac event in hospital, at short term (30-days) and over longer term (360-day) follow-up. χ² test and Wilcoxon (Gehan) Statistic were used for statistical analysis where appropriate.

Results In-hospital cardiac event rates in all risk scores were of no statistically significant difference. At 30-day follow-up, in low risk group, TIMI performs better than the other two risk scores (TIMI vs PURSUIT, p<0.001; TIMI vs GRACE, p<0.001; TIMI > PURSUIT, GRACE in event rate); in intermediate group, TIMI performs than the others again (TIMI vs PURSUIT, p<0.001; TIMI vs GRACE p<0.001; TIMI > PURSUIT, GRACE in event rate); but in the high risk group, PURSUIT performs best (TIMI vs PURSUIT, p=0.023; PURSUIT vs GRACE, p=0.005; PURSUIT> TIMI, GRACE in event rate). At 1-year follow-up, there is no statistical significance among each low risk group; TIMI and PURSUIT performs better in the intermediate group (PURSUIT vs GRACE, p=0.0091; TIMI vs GRACE, p=0.009; PURSUIT; TIMI> GRACE in event rate), but in the high risk group, PURSUIT and GRACE performs better (TIMI vs PURSUIT, p=0.012; TIMI vs GRACE, p<0.001; GRACE > PURSUIT> TIMI).

Conclusions In NSTE-ACS population, TIMI risk score can be widely applied. At 30-day PURSUIT are better than others in the high-risk group. GRACE is superior at long term follow-up in high risk group.

GW23-e1403  RELATIONSHIP OF SERUM TSH WITH LIPID PROFILE IN PATIENTS WITH NEWLY DIAGNOSED ASYMPTOMATIC CORONARY HEART DISEASE

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Objectives Thyroid status may affect lipid profile and the mechanism of this relationship is traditionally attributed to the influence of thyroid hormone. Some recent study indicated that TSH might up-regulate the key enzyme in cholesterol synthesis and have a role in maintaining lipid homeostasis. The goal of this study was to probe into the relationship between serum TSH levels and the lipid profile in patients with newly diagnosed asymptomatic coronary heart disease (CHD).

Methods A retrospective study was conducted including 689 patients with newly diagnosed asymptomatic CHD from 2004 to 2010 in Jinan, China (308 males and 381 females, age ranged 45-88 years). Lipid parameters and the levels of TSH, thyroid hormones were determined. Patients were grouped into different thyroid status according to the thyroid function assay. Multivariate regression analysis was used to assess the association between TSH level and lipid profile. Path model analysis was employed to determine the total effect, direct and indirect effect of TSH on lipid parameters.

Results Most of the patients were euthyroid (78.4%), while the prevalence of thyroid dysfunction including subclinical ones was 21.6%. SCH accounted for 8.6% while subclinical hyperthyroidism accounted for only 1.5%. There were more patients with hypothyroidism than those with hyperthyroidism including the subclinical ones (14% vs 7.7%). In euthyroid patients, the TSH level within the normal range was positively and linearly correlated with log-transformed total cholesterol (TC) and triglycerides (TG) (β=0.191 and 0.113, respectively; p<0.001 and p<0.05, respectively). The analysis based on the equations in path model analysis showed that the total effects of TSH on Log TC and Log TG were significant (path coefficient=0.2026 and 0.1138, t=4.5037 and 2.5028, respectively) in euthyroid patients with newly diagnosed asymptomatic CHD. The results of effects analysis showed that the total effects of TSH on TC and TG were 0.1936 and 0.1095, respectively. The direct effect of TSH on Log TC and Log TG were 0.2028 and 0.1138, respectively. The indirect effect of TSH on Log TC and log TG were negative, which were caused by the direct influence of thyroid hormone.

Conclusions Most of the patients with newly diagnosed asymptomatic CHD were euthyroid, while the prevalence of subclinical hypothyroidism was higher than that of subclinical hyperthyroidism in this study population. TSH levels were positively and linearly associated with the TC and TG levels in euthyroid non-diabetics with newly diagnosed asymptomatic CHD. Within the normal range, TSH might exert direct and positive effect on TC and TG, and the influence on TC was stronger than that on TG.
expected. As a matter of fact, cell therapy is faced a lot of challenges, such as poor survival of the transplanted cells in the infracted region, low number of cells migrated into myocardial lesions, and so on. So the aim of this study is to explore a new strategy that angiotensin receptor type 2 stimulation can improve the engraftment of bone marrow mononuclear cells in the infracted myocardium and recover heart function.

**Methods** Mononuclear cells (MNCs), isolated from SD rat bone marrow, were treated with several reagents which can change the activity of AT2R of MNCs. The experiment group designation for in vitro study were: MNCs, MNCs+AngII, MNCs+AngII+ARB, MNCs+AngII+PD123319 and MNCs+CGP+ARB. The ability of migration and cardioprotection were examined by tran-swell and co-culturing with neonatal cardiomyocytes. The experiment group designation for in vivo study were: DMEM, MNCs, MNCs+CGP42112A and MNCs+AngII+ARB. Cells from different groups were intramyocardially injected into the peri-infarct region. Inflammatory cytokine expression, death of cardiomyocyte, anti-apoptotic protein expression were assessed 3 days after transplantation. Meanwhile we transplant above-mentioned female rats’ cells into male rats via tail vein, and evaluate the number of engrafted cells 1 day after transplantation by real-time PCR. Infant size, angiogenesis and heart function were measured 1 month after transplantation.

**Results** Bone marrow mononuclear cells, when their AT2R were stimulated, can prevent neonatal cardiomyocytes from apoptosis in vitro. Also more cells migrated into low chamber in same situation. Transplantation of AT2R-activated bone marrow cells intramyocardially after myocardial infarction resulted in decrease in inflammatory cytokines (IL-1, IL-6, MCP-1) expression, death rate of cardiomyocytes in peri-infarct region, as well as increase in anti-apoptotic protein expression (Bcl2). Also more bone marrow mononuclear cells were found in myocardial lesions 1 d after transplantation via tail vein. No matter which transplanted routes we choose, transplantation of AT2R-activated bone marrow cells can improve heart function significantly.

**Conclusions** Angiotensin receptor type 2 stimulation can increase the migration of bone-marrow mononuclear cells into the infracted myocardium and prevent cardiomyocytes from apoptosis, thus activate AT2R of bone marrow stem cells maybe a novel option for enhancing benefits of stem cell therapy.

**GW23-e0262**

**THE STUDY OF THE CORRELATION BETWEEN DISTRIBUTION OF BODY FAT AND CORONARY HEART DISEASE**

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**Objectives** To investigate the association between distribution of body fat and coronary heart disease (CHD) by analysing the correlation between body fat distribution measures and incidence, type and severity of coronary heart disease.

**Methods** One hundred and ninety-seven patients (male 118 and female 79) with suspected coronary heart disease were studied by the case-control method, who were divided into acute infarction (AMI) group (n=52), angina group (n=100) and non-CHD group (n=45); and according to the results of coronary arteriography they were divided into: normal group (n=45), Single-vessel disease group (n=48) double -vessel disease group (n=51) and triple-vessel disease group (n=55). Blood lipids were detected by the standard method. Body surveying index consisting of the patients’ height, weight, neck circumference and waist circumference was measured and body mass index (BMI) were computed. Analysis the correlation between body fat distribution measures and incidence, type and severity of coronary heart disease. CHD risk factors were collected by logistic multivariate regression analysis.

**Results**

1. Male and female have different features in distribution of body fat, and CHD has different characteristic in them (p<0.05);
2. Compared with non-CHD group and angina groups, weight and waist circumference were higher in AMI group (p<0.05). Compared with non-CHD group, neck circumference were higher in angina and AMI groups (p=0.009 & 0.000);
3. In the four groups divided by vessel disease, there were significant difference in neck circumference (p=0.014), compared with double and triple vessel disease groups neck circumference were lower in single-vessel disease group (p=0.0118±0.002);
4. Multiple correlative analysis showed BMI, NC and WC were positively correlated with TC and vLDLc, WC was also correlated with chd and HDLc (p<0.05), NC was positively correlated with type coronary heart disease and the number of diseased vessels (p=0.000 ± 0.002).
5. Logistic multivariate analysis indicated that BMI (β=0.162, p=0.005), NC (β=0.222, p=0.000), diabetes (β=1.154, p=0.047) were closely related to the hazard of CHD.

**Conclusions**

1. The associations with lipid were stronger for BMI and waist circumference than it for neck circumference;
2. Compared with WC and BMI, neck circumference offered greater sensitivity for the diagnosis in coronary artery disease, and associated with the number of diseased vessels;
3. BMI and NC were important risk factors of coronary artery disease;
4. Distribution and Content of fat should be comprehensively evaluated by various body fat distribution measures, so that risk evaluation of CHD can be provided.

**GW23-e1402**

**TSH IN THE UPPER LIMITS OF THE NORMAL RANGE IS ASSOCIATED WITH AN ADVERSE LIPID PROFILE IN EUTHYROID NON-DIABETICS WITH NEWLY DIAGNOSED ASYMPTOMATIC CORONARY HEART DISEASE**

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**Objectives** Lipid profile is influenced by both thyroid function and glucose metabolism. Increasing evidence demonstrated that TSH might affect the cardiovascular risk factors through some extra-thyroidal effects. The goal of this study was to evaluate the relationship between serum TSH levels and the lipid profile in euthyroid non-diabetics with newly diagnosed asymptomatic coronary heart disease (CHD).

**Methods** A retrospective study was conducted including 438 euthyroid non-diabetics (209 males and 229 females, age ranged 40–83 years) with newly diagnosed asymptomatic CHD from 2004 to 2010 in Jinan, China. Lipid parameters and the levels of TSH, thyroid hormones were determined. The patients were divided into three groups according to different TSH levels within the normal range: a lower limits TSH subgroup (TSH 0.3–0.99 mIU/l, G1), a moderate TSH subgroup (TSH 1.0–1.89 mIU/l, G2) and a upper limits TSH subgroup (TSH 1.9–4.8 mIU/l, G3). Regression analysis and ORs were used to assess the influence of the parameters on the lipid profile and to estimate the risks of dyslipidemia with respect to the TSH levels.
Results. The TSH level, even within the normal range, was positively and linearly correlated with total cholesterol (TC), non-high density lipoprotein cholesterol (non-HDL-C) and triglycerides (TG) (β=0.200, 0.224 and 0.128, respectively; p<0.001, p<0.001 and p<0.05, respectively). Within the normal range, the ORs of the risk of hypercholesterolemia and hypertriglyceridaemia with respect to TSH level within normal range were 1.927 (95% CI 1.013 to 1.584, p=0.038), respectively. When running sub-analysis, compared with those in G1, the TC levels were significantly higher in G2 (5.10±1.04 vs 4.79±1.01 mmol/l, p<0.01) and G3 (5.20±1.02 vs 4.79±1.01 mmol/l, p<0.01). The levels of LDL-C were significantly higher in G2 and G3 when compared with those in G1 (3.13±0.79 vs 2.84±0.65 mmol/l, 3.06±0.78 vs 2.84±0.65 mmol/l, respectively, p<0.01 and p<0.05, respectively). The levels of non-HDL-C were also significantly higher in G2 and G3 when compared with those in G1 (3.83±0.98 vs 3.46±1.02 mmol/l, 3.89±1.07 vs 3.46±1.02 mmol/l, respectively, p<0.01 in both). The prevalence of hypercholesterolaemia in G2 and G3 was significantly higher than that in G1 (16.78% vs 4.05%, 18.80% vs 4.05%, respectively; p<0.01 in both). For hypertriglyceridaemia, the prevalence was approximately 2-folds greater in G2 and G3 than that in G1 (54.90% vs 17.57%, 56.28% vs 17.57%, respectively; p<0.01 in both).

Conclusions. TSH levels were associated in a positive and linear manner with the TC, non-HDL-C and TG levels in euthyroid non-diabetics with newly diagnosed asymptomatic CHD. TSH in the upper normal range might exert adverse effects on the lipid profile and might represent a risk factor for hypercholesterolemia and hypertriglyceridaemia in the context of CHD. Maintaining TSH in a relative low normal range might be beneficial for lipid profile in euthyroid non-diabetics with newly diagnosed asymptomatic CHD.

GW23-e2384 THE PARAOXONASE L55M POLYMORPHISM IN PATIENTS WITH CORONARY HEART DISEASE IN CHINESE POPULATION

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Objectives. To investigate the distribution of the L/M polymorphism of PON1 gene in Chinese Han nationality and to analyse the association of PON1 gene, serum PON1 activity with coronary heart disease (CHD).

Methods. All cases were in-patients in Department of Cardiology of Guangdong Medical University Affiliated Futian Hospital from January 2010 to January 2012. According to the results of coronary angiographies and previous history of percutaneous coronary interventions (PCI), patients were divided into two groups, CHD groups: 160 cases, stenosis of coronary artery >50%; control group: 92 cases, normal coronary artery.

The paraoxonase1 genotypes were determined by MALDI-TOF MS in 160 patients with CHD and 92 healthy persons. PON-1 activity levels were detected by ELISA. SPSS19.0 was used for statistical analyses.

Results. 1 We found that PON1 codon 55 with restriction enzyme digestion has three genotypes in this study population: LL, LM, MM. The frequencies of LL, LM and MM genotypes of PON1 in CHD group were 97.5%, 2.5% and 0%, respectively; and those in control group were 96.7%, 3.3% and 0%, respectively; the frequencies of L and M alleles in CHD group were 98.3% and 1.2%, and those in control group were 98.4% and 1.6%. No differences were found in PON1 gene Met-Leu polymorphisms among different narrow degrees of coronary artery, and no differences were found between myocardial infarction and non-infarction groups (p>0.05).

II Serum PON1 activity ([62.10±50.80] IU/l) in CHD patients was significantly lower than that in healthy controls ([89.91±89.82] IU/l) (p<0.01). The serum PON1 activity of different PON1 L55M genotypes LL was significantly different between CHD patients and healthy controls (p<0.01), and the genotypes ML was no statistically significant different between CHD patients and healthy controls (p>0.05). The serum PON1 activity of different PON1 L55M genotypes had no statistically significant difference in the groups of CHD patients and healthy controls (p>0.05).

III PON1 activity level was significantly lower in senior subgroup than in non-senior subgroup in CHD patients ([53.48±47.57] IU/l vs [74.26±58.79] IU/l, p<0.05).

Conclusions. 1. These results suggested that the L55M polymorphism of the PON1 gene was not associated with coronary heart disease in Chinese population.

2. PON-1 L55M genotypes LL maybe one of the risk factors for CHD.

3. The study showed that the activity of PON1 was lower in the CHD group than that in the non CHD group. The relationship...
between the activity of PON-1 and the severity of the coronary artery atherosclerosis lesions was negative.

4. PON-1 activity is flexible the valve can severity of coronary atherosclerosis. The decrease of serum PON-1 activity is one of the risk factors for CHD.

GW23-e0384  THE EFFECT OF HYPOXIA ON GLOBAL GENE EXPRESSION AND ALTERNATIVE SPLICING OF HUMAN MESENCHYMATOUS STEM CELLS

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Objectives Hypoxia preconditioning has become a novel strategy to improve the in vivo therapeutic potential of bone marrow-derived mesenchymal stem cells (MSCs). However, the underlying molecular mechanisms responsible for the hypoxia-induced survival and migration of MSCs are not fully characterised, and a better understanding of such process may lead to a novel strategy for stem cell-based therapies.

Methods To elucidate the molecular mechanisms underlying the beneficial effect of hypoxia preconditioning on MSCs, we used standard expression microarray and exon microarray to investigate the global profiling of gene expression and alternative splicing (AS) in hypoxia preconditioned-MSC (H-MSC) and normoxia treated-MSC (N-MSC) respectively.

Results A total of 414 differentially expressed genes were identified in H-MSC compared with N-MSC, including 138 unregulated genes and 276 down regulated genes. A large number of genes are responsible for enhanced therapeutic effect of H-MSC, especially associated with promoting cell survival, proliferation, migration, angiogenesis, and glucose metabolism. Based on the genes that regulate cell survival and migration, most of them are respectively involved in mitochondrial apoptosis pathway and cell cytoskeleton organisation. These results were further confirmed by mitochondrial membrane potential assay and F-actin staining, indicating the effect of hypoxia on MSC survival and migration may relate with mitochondrial apoptosis pathway and cytoskeleton organisation. Furthermore, the high expression of glucose metabolism-associated genes such as leptin in H-MSC may indicate a novel mechanism of hypoxia-driven anti-apoptosis, migration and angiogenesis of MSCs. Besides the gene expression difference, hypoxia also resulted in 93 AS events that were associated with anti-apoptosis, proliferation, migration and angiogenesis.

Conclusions Our work provides a general framework for the systematic study of stem cell biology under clinically relevant pathophysiological conditions.

GW23-e0469  COMPLEX CORONARY LESIONS AND ROTATIONAL AHERECTOMY FROM SINGLE CENTRE EXPERIENCE

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Objectives During past few years, Interventional cardiologists have met more and more challenge cases. Rotational atherectomy uses a tiny rotating cutting blade to open a narrowed artery and improve blood flow to or from the heart. Pre-treating calcified lesions with rotational atherectomy can be one of the best ways to enhance proper stent placement.

From August 2006 to August 2011, there are 253 patients with 289 lesions received RA in our heart centre, transradial approach. (Age 75±12 years, Type A 23 cases, Type B1 25 cases, Type B2 154 cases, Type C 87 cases).

Methods Guiding Selection by Right Side Transradial Approach include:

- LAD: EBU 3.5
- CX: AL1–1.5, EBU3.5
- RCA: AL0.75–1, JR 3.5–4
- Burr/artery ratio is 0.55±0.08, Burr side 1.25–1.75 mm, Adjunctive Balloon
- 246 (85%), Stenting rate after Rota is 100%. Most lesions (>90%) we used RA are heavy calcified lesions in our centre, over 60% patients received IVUS before RA, most calcification is over 180°. The meaning of IVUS:
  - Viewing site and range of calcification
  - Selection of burr size
  - Observation of complications
  - Quality of stent deployment

If the IVUS catheter cannot pass the lesion, or the lesions cannot be dilated by a balloon at low pressure (6–8 atm), we select Rotational Atherectomy without IVUS test. In some cases with ostial lesions, “hard” but no calcified lesions, we also select RA. We often select ‘small’ burr, such as 1.25 and 1.5 mm, to do RA, the purpose of RA in our centre is to make the stent delivery smoothly, and debuls atherosclerotic plaque at the same time. After RA, we dilate the lesion with low pressure about 6–8 atm, and then, put stents. We use Post-dilation as possible as we can. Following are good ways to decrease complications depending on our experience:

- Increasing burr size step by step
- Reasonable Burr/artery ratio (0.5–0.7)
- Maintaining SBP≥100 mm Hg
- Enough time for observation coronary flow between two rotations

Results Procedure success rate is 98% (283/289); In-hospital major complications after RA are low:

- Perforation 2 (0.69%); Dissection 3 (1%); Side branch occlusion 0; Slow flow/no flow 5 (1.7%); AMI 0; Non-AMI 3 (1.2%); Abrupt closure 0; CABG 0.

Conclusions During DES era, RA is more useful technique for the patients with complex lesions, especially calcified and non-dilatable lesions. The purpose of RA is to making a high quality of deployment of stent instead of big debulking as possible. In our centre, RA procedure success rate is high with the low rate of complications.

GW23-e0795  A CLINICAL STUDY OF THE EXTRACORPOREAL CARDIAC SHOCK WAVE THERAPY FOR CORONARY ARTERY DISEASE

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Objectives To evaluate the security and efficiency of extracorporeal cardiac shock wave therapy (CSWT) for treatment of coronary artery disease.

Methods A total of 45 patients with coronary artery disease (CAD) were included in this study (Male 56, Female 9, mean age 67 years
old). Patients were randomly divided into a shock wave therapy group (25 patients were treated with shock wave energy, 200 shots/spot at 0.09 mJ/mm² for 9 spots, amount to 9 times within 3 months) and a control group (20 patients were not treated with shock wave energy). The testing time points of patients in shock wave therapy group were before shock wave therapy (0 month), the end of nine times of shock wave therapy (3 month), and the corresponding testing time points of patients in control group were the time of enrolment, 3 months follow-up. Patients in both groups were subjected to cardiac double-nucleide single photon emission CT (SPECT) examinations using 99Tcm-methoxyisobutylisonitrile (99Tcm-MIBI), 18F-fluoro-deoxyglucose (18F-FDG) and microvolt T wave alternans (MTWA) examination, and their Canadian Cardiovascular Society (CCS) angina grading, New York Angina Questionnaire (SAQ) scoring, nitroglycerin dosage, 6 min walk test (6MWT). Left ventricular ejection fraction (LVEF) was evaluated at the time points above. During clinical follow-up was not less than 3 months, changes of mortality, myocardial reinfarction rate, readmission rate, myocardial perfusion, myocardial metabolism and cardiac function of patients in the two groups were compared.

**Results** All 45 patients completed follow-up. After treatment of CSWT, the total score of myocardial perfusion imaging and myocardial metabolism imaging, NYHA cardiac function grading, CCS angina grading, nitroglycerin dosage, SAQ scoring, 6MWT, LVEF and MTWA of patients in shock wave therapy group at the time points of 3 months were all significantly improved when compared to those at the time point of 0 month (28.16±4.63 score vs 53.72±5.84 score, 22.88±3.17 score vs 28.28±4.89 score, 1.48±0.65 vs 2.16±0.69, 1.46±0.58 vs 2.72±0.46, 1.00±0.73 times/week vs 2.35±0.86 times/week, 76.40±8.65 score vs 65.96±11.78 score, 427.92±5.84 score vs 22.88±3.17 score vs 44.80±12.24 μV, p all <0.05) and those in control group at the same time points (p all >0.05). But in control group, all the above parameters have no significant change compared with 0 month (p all>0.05). During follow-up, no death and myocardial re-infarction was found in shock wave therapy group after treatment. 1 patient died in control group because of SCD and 1 patient suffered from AMI. Eleven person-time suffered from readmission, 3 person-time of the shock wave therapy group, 11 person-time of the control group (p<0.05).

**Conclusions** Extracorporeal cardiac shock wave therapy is a safe, non-invasive and effective therapeutic option for CAD.

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**ANALYSIS OF RADIAL ARTERY SPASM AND VASODILATOR INTERVENTION STUDY**

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**Objectives** The aim of the study was to observe the correlative factors of radial artery spasm (RAS), compare the effect of different spasmylytic regimens on RAS by radial artery angiography.

**Methods** One hundred and eighty patients (97 males and 83 females) undergoing transradial coronary angiography or intervention at our center were divided into three groups: nitroglycerin group (60 patients), nicardipine group (60 patients) and cocktail group (60 patients) randomly. The radial angiography was performed through the sheath at baseline. Then nitroglycerin 200 μg, nicardipine 200 μg and 100 μg of nicardipine plus 100 μg of nitroglycerin were injected respectively through the right radial arteries. Radial arteriograms were taken 1 min and 2 min after injection of vasodilators. The RAS incidence was compared at baseline, 1 min and 2 min after injection of vasodilators by one-way ANOVA in three groups. Stenosis of radial arteries in diameter was measured by quantitative computed analysis (QCA) method on radial arteriograms. RAS was defined as stenosis >70%, and clinical RAS was defined as patients’ feeling of pain or there was obvious resistance in advancing or withdrawing catheters.

**Results** The total RAS rate was 10.6%, and clinical RAS rate 6.2%. Diameter of radial artery, sheath profile and previous TR history >2 were RAS independent risk factors. The RAS rate at baseline nitroglycerin group, nicardipine group and cocktail group was 15%, 3.3% and 8.3% (no significant difference), 3.3%, 5.0% and 1.7% (no significant difference) at 1 min after injection of vasodilators, 1.7% (vs Nicardipine group, p<0.05), 3.3% and 0% (vs other two groups, both p<0.05) at 2 min after injection.

**Conclusions** RAS rate was 10.6%. The independent relative factors of RAS included diameter of radial artery, sheath profile and ≥2 previous TR history. Nitroglycerin and Nicardipine can significantly dilate radial arteries, but the combination of both has a more powerful effect.

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**CHANGES OF ELECTROCARDIOGRAM AND CK-MB IN THE PATIENTS WITH CEREBRO-CARDIAC SYNDROME CAUSED BY ACUTE CEREBRAL INFARCTION**

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**Objectives** To investigate the changes of ECG activity and CK-MB in the patients with cerebro-cardiac syndrome caused by acute cerebral infarction and to analysis the relationship between ECG, CK-MB and the site of lesion, the area of infarction.

**Methods** To study ECG changes and CK-MB elevation of 126 patients with cerebro-cardiac syndrome caused by acute cerebral infarction. According to CT and MRI, it was divided to three groups: large area of infarction group (infarct diameter >3.0 cm), lacunar infarction group (infarct diameter <1.5 cm) and other group (1.5 cm< infarct diameter <3.0 cm). And clinical date of different injury parts was analysed. We analysed the ECG respectively in the different site of injury include lobes of the brain, the thalamus, basal ganglia, brain stem, cerebellum, and corona radiata. And ck-mb in serum was detected meanwhile.

**Results** 135 patients with cerebro-cardiac syndrome, 82 (60.7%) had abnormal ECG and the incidence of abnormal ECG caused by cerebral infarction in lobes of the brain, the thalamus-basal ganglia, brain stem, cerebellum and corona radiata is 11 (61.1%), 26 (74.5%), 21 (70%), 6 (66.7%), 18 (42.8%) respectively. The incidence of abnormal ECG has no obvious differences among the site of lobes of the brain, the thalamus-basal ganglia, brain stem and cerebellum. But the incidence of ECG in corona radiata was lower than all of them (p<0.01). The abnormal ECG expression is varied. arrhythmia appears in 57 patients, ST changes in 38 cases (26.7%) and left room high voltage has in 36 cases (20%), bundle block appears in 23 patients (12.8%) and QT prolongation was found in 16 cases (9.9%). arrhythmia and ST changes are more frequency than other abnormal ECG. There are 32 patients in the group of large area of infarction and 28 patients in the group of lacunar infarction and 22 patients in the other group. Compared them each other, we found that large area of infarction group has higher rate of abnormal electrocardiogram than lacunar infarction group and
of the inflammatory response, anemia, low protein, endocrine disorders, and abnormal coagulation performance; X line inspection mainly for the left cardiac insufficiency cardiac left enlargement, or a generally increased, and pericardial effusion is not easy to distinguish; ECG examination showed left ventricular hypertrophy and strain change and all kinds of arrhythmia; UCG examination showed left ventricular systolic function, EF and FS were decreased.

3. In 19 cases of PPCM in the last 3 months of pregnancy in 94.74% patients undergoing caesarean section.
4. Compared with healthy contrast group, the Logarithm of serum NT-proBNP of PPCM group and physiological responses group during trimester of pregnancy rise significantly. The serum cTnI of PPCM group are higher significantly than healthy contrast group but the serum cTnI of physiological responses group during trimester of pregnancy has no statistical significance compared with healthy perinatal contrast group (p>0.05).

5. Compared with those of healthy perinatal control group, serum cTnI levels of PPCM of the early stage NYHA I subgroup rise significantly, while NT-proBNP difference had no statistical significance. NT-proBNP levels rise significantly in physiological responses group and the difference of serum cTnI had no statistical significance. Compared with healthy control group, the above two indexes rise significantly in PPCM early stage NYHA II subgroup and the difference had statistical significance. Because the patients of PPCM early stage NYHA I level had gotten myocardial injury but there was no HF and myocardial injury. Due to HF that increased the overload of ventricular volume and myocardial injury, the level of NT-proBNP and cTnI both rise in PPCM group.

6. The sensitivity of serum NT-proBNP in early stage diagnosis of PPCM was relatively high. Especially for PPCM early stage NYHA II level diagnosis, the sensitivity was 100 percent but specificity and negative forecast number was relatively low and positive forecast number was less than 55 percent. The sensitivity, specificity, negative and positive forecast number of serum cTnI for PPCM early stage diagnosis were higher than 90 percent.

7. Compared with those of healthy control group, D-dimer level of physiological responses group rise significantly. Compared with those of physiological response group, D-dimer level PPCM group rise significantly. The length of stay in hospital were

other group. There has more differences among them (p<0.05). Abnormal CK-MB increase was in 65 (48.1%). The part of the brain damage was related to the site near the basal ganglia and thalamus lesions of its high rate of abnormal CK-MB. Meanwhile, large area of infarction group has higher rate of CK-MB than lacunar infarction group and other group. Patients with abnormal ECG had higher incidence of CK-MB elevation (p<0.01).

Conclusions: Discussion Early abnormal electrocardiogram changes and the increase of the abnormal CK-MB occurs in cerebro-cardiac syndrome and it related with the part and the area of the acute cerebral infarction. The most common abnormalities of ECG changes after the acute cerebral infarction was arrhythmia and ST changes. Patients with poor outcome had higher incidence of ECG changes and CK-MB elevation than patients with good outcome.

THE REASEARCH INTO THE CLINICAL CHARACTERISTICS OF PERIPARTUM CARDIOMYOPATHY

GW23-e1104

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Objectives The research is to find the related risk factors that may lead to PPCM through analysing and summarising the general clinical characteristics of PPCM patients. NT-proBNP is used to diagnose the heart failure; cTnI is the preferred biochemical index of myocardial injury and D-dimer is used to diagnose the thrombosis embolism and DIC. The research investigated the clinical values of the above three factors in PPCM’s early diagnosis, differential diagnosis, treatment and prognostic evaluations.

Methods In this research, 79 patients classified as PPCM, 30 patients classified as late pregnancy physiological responses and 35 patients classified as healthy peripartum are selected. Firstly, the clinical data of 79 cases of patients was collected and the test results of NT-proBNP cTnI and D-dimer in the clinical documents were analysed from two angles of view:hemodynamic and myocardial cell damage. The NT-proBNP levels of sample were tested by domestic ssg-2 multi-function immune detector and the reagents were golden standard card. The measured values exceeding the mean value of healthy peripartum of 2 times were regarded as positive. The test of cTnI was done by American Boshi Triage analyser through fluorescence immunooassay method. The reference value was less than 0.4 ng per ml. The test of D-dimer was done by Japan made symex CA7000 analyser through immune turbidimetry method. The reference value was between zero and 0.55 per Liter. The clinical significance of the three indexes in three classified patients were carefully observed.

Results
1. The PPCM in this region the total incidence rate was 6.90%, the last 3 months of pregnancy incidence was 24.08%, within 3 months postpartum onset was 67.09%, postpartum 3 months after the onset of 8.56%, urban area accounts for 7.59%, the county accounted for 20.25%, accounted for 72.15% of the rural cadres, workers accounted for 6.33%, 15.19%, the farmer occupations 78.48%, advanced maternal age accounted for 50.63%, prolific accounted for 81.01, anaemia, hypertension accounted for 44.30%, accounted for 41.77%, malnutrition accounted for 89.57%.

2. In PPCM major clinical manifestations of left heart insufficiency and early HF diagnosis of left ventricular systolic performance, similar to HF severe right heart failure and whole heart failure occurs when the performance of routine laboratory tests; most
prolonged in those whose D-dimer rise high in PPCM group.

**Conclusions** PPCM in this region the total incidence rate was 6.90%, with 3 months postpartum onset to see more, rural city, farmers, workers and cadres, prolonged malnutrition, endocrine disorders, prenatal care, maternal age, less prolific, caesarean section, hypertension, inflammation, and closely related to the onset of PPCM. PPCM in patients with caesarean section rate is far greater than the rate of vaginal delivery; clinical manifestations of PPCM and related auxiliary examination for left ventricular dysfunction and early performance of HF; combined test of two indexes of NT-proBNP and cTnI is helpful for PPCM early diagnosis and differential diagnosis. The differential diagnosis value of serum cTnI for NT-proBNP and cTnI is helpful for PPCM early diagnosis and differential diagnosis. The differential diagnosis value of serum cTnI for NT-proBNP and cTnI is helpful for PPCM early diagnosis and differential diagnosis. The differential diagnosis value of serum cTnI for NT-proBNP and cTnI is helpful for PPCM early diagnosis and differential diagnosis.

**GW23-e1202**

**A NOVEL POLYMORPHISMS IN THE ABCA1 GENE M233V IN MONGOLIA POPULATION**

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**Objectives** To investigate whether ATP-binding cassette transporter 1 (ABCA1) M233V genetic variation is correlated with blood lipids in Mongolian population and the association of this polymorphism with coronary heart disease (CHD).

**Methods** The target fragments of ABCA1 gene was amplified and analysed by PCR-restriction fragments length polymorphism (RFLP) technique in 115 Mongolian control subjects without CHD and patients with CHD.

**Results** A novel polymorphism in the ABCA1 gene was found in 32 patients: M233V which exists in exon 7 of ABCA1 gene and it’s cDNA location is A1092G and converses 233 amino acid from Methionine to Valine. ABCA1 gene M233V polymorphism were existing in Mongolian population, which had three types MM genotype, MV genotype andVV genotype. The highest frequency of ABCA1 M233V genetic variation was MM genotype, the next was MV genotype and the lowest was VV genotype in Mongolian population. There was no significant difference in frequency of allele and genotype in M233V polymorphism between controls and CHD patients (p>0.05). No significant difference was found in level of TC, TG, HDL-C, LDL-C between MM genotype and MV+VV genotype (p>0.05).

**Conclusions** M233V is a novel polymorphism in the ATP-binding cassette transporter A1 gene. The highest frequency of ABCA1 M233V genetic variation was MM genotype, the next was MV genotype and the lowest was VV genotype in Mongolian population.

**GW23-e1037**

**DO HYPOGLYCAEMIA AND HYPERGLYCAEMIA HAVE SIMILAR EFFECTS ON ALL-CAUSE MORTALITY ACROSS THE SPECTRUM OF SEVERITY OF CORONARY ARTERY DISEASE?**

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**Objectives** We have previously reported that in patients with acute myocardial infarction (AMI), increased as mildly decreased admission fasting plasma glucose (FPG) levels could predict higher in-hospital and 3-year mortality. Although more attention has been paid to glucose level abnormalities, many missing links in the chain of evidence remain in our understanding of the association between glycaemia and prognosis. The aim of this study therefore was to assess the association between admission FPG levels and all-cause mortality among patients with stable coronary artery disease (SCAD), unstable angina pectoris (UAP) and acute myocardial infarction (AMI) by analysing data from the Beijing Heart and Metabolism Survey (BHMS).

**Methods** A total of 18999 consecutive patients were recruited. According to the quartiles of FPG levels, patients were categorised into 4 groups: Q1, FPG < 5.1 mmol/l; Q2, 5.1 mmol/l ≤ FPG < 5.9 mmol/l; Q3, 5.9 mmol/l ≤ FPG < 7.5 mmol/l; and Q4, FPG ≥ 7.5 mmol/l. Q1 was recognised as the hypoglycaemic group, Q2/Q3 as the relatively euglycaemic groups, and Q4 as the hyperglycaemic group. The primary endpoint was in-hospital and 2-year all-cause mortality.
UP-REGULATION OF ENDOGENOUS LEPTIN IMPROVES HUMAN MESENCHYMAL STEM CELL SURVIVAL ABILITY IN VITRO AND THIS CELLS PROTECT FATAL CARDIAL MYOCYTES FROM APOPTOSIS

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Objectives  Bone marrow mesenchymal stem cells (BM-MSCs) have been employed as a therapeutic means, to cure multiple ischaemic injuries, including acute myocardial infarction (AMI). However, the anaemic condition inside the infarcted area provides an obstacle for survival. Hypoxia preconditioning can reduce apoptosis of BM-MSCs. This study explored the impact of a hypoxia related up-regulation of leptin in BM-MSC on anti-apoptosis.

Methods  Human bone marrow mononuclear cells (BMNCs) were isolated using Ficoll 400. BM-MSCs are separated by adhering to the flask bottom. BM-MSCs were characterised by detecting cell surface antigens using flow cytometry. BM-MSCs were tested from passage 3∼8 incubated under 0.5% O2, 37°C for 24 h, and prolonged with a 2-h re-oxygen. BM-MSCs cultured in normoxia condition were employed as the control group. Both cells were exposed to an oxygen, glucose and serum deprived (OGSD) condition for 36 h. Endogenous expression of leptin was tested using western blot and ELISA. Leptin neutralising antibody and signalling pathway inhibitors were used. Apoptosis was detected by nuclear staining using DAPI and TUNEL assay. The possible mechanism was assessed using flow cytometry of Annexin V/PI and PI/RNase. Associated signalling pathways were assayed by western blot. Fatal mice cardiac myocytes were isolated and seeded for co-culture in a apoptosis model, with either conditioned medium (CM) from BM-MSCs or BM-MSCs. Fatal mice cardiac myocytes viability was screened by TUNEL assay.

Results  Endogenous expression of leptin was up-regulated in hypoxic pre-conditioned BM-MSCs. Leptin improves anti-apoptosis ability, since it was abolished by leptin neutralising antibody. The anti-apoptosis ability was introduced by activating PI3K/Akt, Erk1/2, and JAK2/STAT3 pathways, respectively. Fatal mice cardiac myocytes co-cultured with CM but not BM-MSC, gained better survival rate vs control group.

Conclusions  Hypoxia related up-regulation of endogenous leptin improves the anti-apoptosis ability of BM-MSCs through multiple survival associated signalling pathways. This BM-MSC protects fatal mice cardiac myocytes from apoptosis via Bcl-2/Bax pathway.
Methods Collect and analyse the clinical data, ECG data and hyper-acoustic data of the patients who had been given the CAG (Coronary Artery Angiography) in the first auxiliary hospital of xinjiang medical university between the year of 2008 to 2011 on account of distensible heart and heart failure. And all of the patients were diagnosed ICM or DCM explicitly by CAG.

Results We find the average age of ICM is older than DCM (61.333 ± 8.904 vs 52.967±10.376); attack rate of chest pain or myocardial infarction in past time of ICM group is higher than DCM group (It takes up 45 cases of 60 in ICM and 6 cases of 60 in DCM who had chest pain, as it takes up 9 cases of 60 in ICM and 0 case of 60 in DCM who had myocardial infarction); the situation of merging with diabetes is 10 cases of 60 in ICM and 2 cases of 60 in DCM; the situation of merging with hyperlipaemia of ICM is more than DCM (22 cases of 60 in ICM vs 8 cases of 60 in DCM with Tall Triglyceride, 11 cases of 60 in ICM vs 1 case of 60 in DCM with Tall Cholesterol, p<0.05).The value of Rv6/Rmax and Rv6/RIII of DCM higher than ICM. Rv6/Rmax≧5 takes up 10 cases (16.67%) in ICM, but in DCM it takes up 40 cases (66.67%), p<0.05.Rv6/RIII≧5 in the group of ICM takes up 22 cases (36.67%), but in DCM it takes up 50 cases (83.33%), p<0.05. The incidence of pathologic Q wave of ICM is higher than DCM (58% in ICM vs 8.33% in DCM, p<0.05) And the change of ST-T in ICM all higher than DCM (p<0.05):the depressed ST segment with or without change of T wave is 63.33% in ICM vs 5% in DCM; the single change of T wave is 21.67% in ICM vs 6.67% in DCM. But the incidence of fragmented QRS has no difference between the two groups (20% in ICM vs 8.33% in DCM, p>0.05).

Conclusions Rv6/Rmax≧5, Rv6/RIII≧5 are useful for diagnosing the DCM:the sensitivity and specificity of Rv6/Rmax≧3 are 66.67% and 83.33%, as the sensitivity and specificity of Rv6/Rmax≧5 are 63.33% and 63.33%. But the pathologic Q wave or the change of ST-T (especially ST segment lower with or without inverted T wave) on the ECG are significant to diagnose the ICM: the specificity of pathologic Q wave is higher relatively (91.67%), the sensitivity and specificity of depressed ST segment with or without change of T wave are lower relatively (63.33% and 65%).

Results There were significant differences between SAP groups and ACS group in terms of PAPP-A (6.59×10^−3 U/L±4.68×10^−3 U/L vs 19.50×10^−3 U/L±12.76×10^−3 U/L, p<0.05), hs-CRP (0.49 ±0.31 mg/l vs 3.57±2.15 mg/l, p<0.01), NO (57.46±4.07 μmol/l vs 44.54±5.15 μmol/l, p<0.05) and FMD (5.96±0.79% vs 3.30 ±1.20%, p<0.05). Using the method of stepwise multiple linear regression and correlation, at the levels of α=0.10, we found that LnPAPP-A was related to Lnhs-CRP and FMD. The constant of the model is 5.57, unstandardised partial coefficient for Lnhs-CRP is 0.533 (95%CI 0.138 to 0.527, p<0.01), FMD —0.625 (95%CI to 1.144—−0.102, p<0.05), respectively. In patients with elevated PAPP-A levels (>11.094×10^−3 U/L), hs-CRP was higher (4.18 ±5.51 mg/l vs 0.56±1.32 mg/L, p<0.001) and FMD was lower (3.30±2.40% vs 6.18±3.59%, p<0.05) than those without elevated PAPP-A levels (≤11.094×10^−3 U/L).

Conclusions Just as CRP regarded as an indirect measure of endothelial function, PAPP-A can act as an indirect method to evaluate endothelial dysfunction in patients with coronary atherosclerosis disease.

GW23-e0377

ISCHEMIC CARDIOMYOPATHY PATIENTS WITH HEART FAILURE—SPECIFIC SERUM PEPTIDOME PATTERN RESEARCH

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Objectives The present study provided the basis for the diagnosis of Ischaemic Cardiomyopathy patients, and determined the specific serum peptide profile by comparing the serum differences between Ischaemic Cardiomyopathy (ICM) patients and normal control group. In addition, this study also discuss the function of the difference protein.

Methods The study collected pre-treatment of ICM and normal control serum samples, which were followed by automated MALDI-TOF MS analysis after peptides extracted on magnetic beads coated with WCX phase. Mass spectrographic data was analysed with ClinproToolTM software, such as GA, SNN and QC. The specific serum peptide model of ICM was established by using genetic algorithms.

Results Through extracting by bead technology with mass spectrometry healthy and disease serum, this study can detect 139 serum peptides. The study detected Ischaemic Cardiomyopathy peptide pattern. The differential expression of the peptide peaks are 47 (n=47), the study selected 1866.17 Da, 7761.49 Da, 1848.81 Da, 2037.57 Da, 2660.54 Da, 7761.49 Da, 1848.81 Da, 2037.57 Da peptide peaks, the study collected pre-treatment of ICM and normal control peptide model of ICM was established by using genetic algorithms.

Conclusions The specific serum peptide model had certain applica- tions in the diagnosis and antiangiostasis of nasopharyngeal carcinoma with heart failure, and provided the basis for discovering a specific marker of Ischaemic Cardiomyopathy.

GW23-e0377

PREGNANCY-ASSOCIATED PLASMA PROTEIN A CAN BE REGARDED AS AN INDIRECT MEASURE OF ENDOTHELIAL FUNCTION IN PATIENTS WITH CORONARY ATHEROSCLEROSIS DISEASE

doi:10.1136/heartjnl-2012-302920j.24

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Objectives To investigate the relationship between the levels of circulating pregnancy-associated plasma protein A (PAPP-A), a novel marker of atherosclerotic plaque activity, and vascular endothelial function in patients with coronary atherosclerosis disease.

Methods To investigate the relationship between the levels of circulating pregnancy-associated plasma protein A (PAPP-A), a novel marker of atherosclerotic plaque activity, and vascular endothelial function in patients with coronary atherosclerosis disease.
GW23-e1854  HIGH SENSITIVITY C-REACTIVE PROTEIN AND THE RISK OF STENT THROMBOSIS AND CARDIOVASCULAR EVENTS

doi:10.1136/heartjnl-2012-302920j.26

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Objectives To investigate in a follow-up study whether high-sensitivity C-reactive protein (hs-CRP) predicts coronary heart disease (CHD) events and stent thrombosis in subjects undergone drug-eluting stent implantation.

Methods We evaluated 3691 patients treated with drug-eluting stents who had a baseline CRP measurement. The primary outcome was stent thrombosis; secondary outcomes were death, myocardial infarction (MI), death or MI, and target vessel revascularisation.

Results During follow-up (median, 2 years), 26 patients had definite or probable stent thrombosis, 146 patients died, 239 had an MI, and 206 underwent target vessel revascularisation. In multivariable Cox proportional-hazards models, elevated levels of hs-CRP were significantly associated with increased risk of stent thrombosis. Elevated hs-CRP levels also significantly predicted the risks of death, MI, and death or MI, but not target vessel revascularisation.

Conclusions Elevated hs-CRP levels were significantly associated with increased risks of stent thrombosis, death, and MI in patients receiving drug-eluting stents, suggesting the usefulness of inflammatory risk assessment with CRE.

GW23-e2286  THE SUBSTRATE OF COMPLEX FRACTIONATED ATRIAL ELECTROGRAMS: EVIDENCE BY PATHOLOGIC ANALYSIS

doi:10.1136/heartjnl-2012-302920j.27

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Objectives Ablation of complex fractionated atrial electrograms (CFAE) is an important adjunctive therapy in atrial fibrillation (AF). The present study was to elucidate the substrate underlying CFAE.

Methods Nine adult mongrel dogs were involved in the present study. AF was induced through rapid atrial pacing with vago-sympathetic nerve stimulation. CFAE was recorded during AF Ablation was performed at CFAE sites. Based on the location of the ablation scar, the atrial specimens were divided into CFAE and non-CFAE sites. Serial sections of the atrium were stained respectively with haematoxylin-eosin (HE) and the general neural marker protein gene product 9.5 (PGP9.5). We compared the characteristics of the myocardium and the ganglionated plexus (GPs) distribution between the CFAE and non-CFAE sites.

Results The myocardium of non-CFAE sites was well-organised with little intercellular substance. However, the myocardium in the CFAE site was disorganised with more interstitial tissue (61.7±24.3% vs 34.1±9.2%, p<0.01). GPs in the CFAE site were more abundant than in non-CFAE sites ((34.45±37.46) bundles/cm² vs (6.73±8.22) bundles/cm², p<0.01).

Conclusions The heterogeneity of the myocardium and GPs distribution may account for the substrate of CFAE and serve as a potential target of ablation.

GW23-e2078  THE CORRELATION BETWEEN SERUM SULFATIDE AND RESTENOSIS IN CHINESE PATIENTS WITH CORONARY HEART DISEASE AFTER PERCUTANEOUS CORONARY INTERVENTION

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Objectives This study aims to determine the correlation between the concentration of serum sulfatide and restenosis after Percutaneous Coronary Intervention (PCI) in Chinese patients with Coronary Heart Disease (CHD).

Methods We studied 68 consecutive patients with CHD of single-vessel disease who successfully underwent PCI. All patients were evaluated by follow-up angiography a mean of 6.5 months after PCI and were divided into the restenosis (20 patients) and the non-restenosis (48 patients) groups.

Results The serum sulfatide concentration (18.75±3.81 mmol/l) in the restenosis group was significantly higher than that (11.52±3.37 mmol/l) in the nonrestenosis group (p<0.001). Multiple logistic regression analysis for risk factors revealed a significant correlation between restenosis after PCI and serum sulfatide (p=0.005). The concentration of serum sulfatide was positively correlated with the coronary percent stenosis at the time of follow-up angiography (r=0.32, p<0.01).

Conclusions High concentration of serum sulfatide is therefore a risk factor for restenosis after PCI in Chinese patients with CHD.
The correlation analysis showed that P-selectin was significantly and positively correlated with hs-CRP (r=0.608, p<0.01) and MDA (r=0.695, p<0.01). Hs-CRP also had positive correlations with MDA (r=0.667, p<0.01).

Conclusions

1. The concentration of hs-CRP, MDA and P-selectin was significantly and positively correlated with each other which demonstrate that together the interactions of inflammation, oxidative stress and platelet activation lead to the occurrence and development of CHD.

GW23-e0267

PLASMA CATESTATIN LEVEL IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND ITS CORRELATION WITH VENTRICULAR REMODELLING

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Plasma cestatin (a specific endogenous regulator of renin-angiotensin system) level in patients with acute myocardial infarction and its correlation with ventricular remodelling were detected. Subjects included 58 patients with AMI, 26 patients with stable angina pectoris (SAP) and 30 healthy subjects (control group). Plasma cestatin was significantly lower in patients with AMI than those in control group (p<0.01). However, no significant difference was found between SAP group and control group. The plasma cestatin level was positively correlated with troponin I level (r=0.738, p<0.01) in AMI group. The plasma cestatin level was negatively correlated with left ventricular end-diastolic diameter (r=-0.372, p<0.01) and left ventricular ejection fraction (r=-0.398, p<0.01) in AMI group. The plasma cestatin level was positively correlated with left ventricular mass index (r=0.366, p<0.05) in AMI group. The plasma cestatin level was positively correlated with left ventricular end-diastolic diameter (r=0.476, p<0.01) and left ventricular ejection fraction (r=0.447, p<0.01) in SAP group. The plasma cestatin level was negatively correlated with left ventricular mass index (r=-0.725, p<0.01) in SAP group. These results indicated that plasma cestatin level decreased with the occurrence of acute myocardial infarction, and its reduction may be related to the development of ventricular remodelling in patients with AMI. This study also demonstrated that plasma cestatin level in patients with stable angina pectoris was lower than those in control group, but it had positive correlation with left ventricular mass index. It suggested that plasma cestatin level was closely associated with the stability of atherosomatic plaque, and the clinical manifestation.

GW23-e0075

EFFECTS OF INFLAMMATION, OXIDATIVE STRESS AND PLATELET ACTIVATION ON CORONARY HEART DISEASE AND THEIR INTERACTIONS

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Objectives To investigate changes in inflammation, oxidative stress and platelet in patients with coronary heart disease (CHD) and the relationship among them by determining the levels of inflammatory markers, product of oxidative stress and platelet activation.

Methods 67 CHD patients (48 males and 19 females) were selected, with an average age of (60.0±11.8) years old, of them, 14 stable angina pectoris (SAP), 25 unstable angina pectoris (UAP) and 28 acute myocardial infarction (AMI) patients. 20 patients with PSVT were selected as controls. Their serum high sensitivity C-reactive protein (hs-CRP), plasma malondialdehyde (MDA) and P-selectin levels were determined, and their relationships analysed.

Results

1. The hs-CRP level in patients with SAP group ((1.57±1.15) mg/l), UAP group ((9.30±3.59) mg/l) and AMI group ((9.61±4.22) mg/l) were markedly higher than those in the control group ((0.84±0.96) mg/l). Compared to the control group, the concentration of hs-CRP in SAP group had no significant difference; The hs-CRP in UAP group was significantly different from the control group (p<0.01) and SAP group (p<0.01). The hs-CRP in AMI group was significantly different from the control group (p<0.01), SAP group (p<0.01) and UAP group (p<0.01).

2. The plasma concentration of MDA in patients with SAP group ((9.66±2.08) μM), UAP group ((13.31±3.01) μM) and AMI group ((15.44±4.55) μM) were markedly higher than those in the control group ((7.11±4.67) μM). Compared to the control group, the concentration of MDA in SAP group had no significant difference; The MDA in UAP group was significantly different from the control group (p<0.01) and SAP group (p<0.01). The MDA in AMI group was significantly different from the control group (p<0.01) and SAP group (p<0.01), but not significantly different from UAP group.

3. The plasma concentration of P-selectin in patients with SAP group ((117.84±44.74) ng/ml), UAP group ((160.61±59.36) ng/ml) and AMI group ((198±6) ng/ml) were markedly higher than those in the control group ((7.11±4.67) ng/ml). Compared to the control group, the concentration of P-selectin in SAP group had no significant difference; The P-selectin in UAP group was significantly different from the control group (p<0.01), SAP group (p<0.01) and UAP group (p<0.01).

4. The correlation analysis showed that P-selectin was significantly and positively correlated with hs-CRP (r=0.559, p<0.01) and MDA (r=0.695, p<0.01). Hs-CRP also had positive correlations with MDA (r=0.667, p<0.01).

Conclusions

1. The concentration of hs-CRP, MDA and P-selectin in patients with CHD were markedly higher than those in the control group, and were increased from the stable angina group to unstable angina group and acute myocardial infarction group. Accordingly, Inflammatory response, oxidative stress and platelet activation were closely associated with the stability of atheromatous plaque, and the clinical manifestation.

2. P-selectin, MDA and hs-CRP were significantly and positively correlated with each other which demonstrate that together the interactions of inflammation, oxidative stress and platelet activation lead to the occurrence and development of CHD.
Objectives The evaluation of ventricular remodelling and functional recovery are essential in predicting the prognosis of patients with acute myocardial infarction (AMI). In the current study, we detected the plasma catestatin in patients with acute myocardial infarction, and investigated the association between plasma catestatin and heart function, as well as ventricular remodelling.

Methods Fifty-eight consecutive patients, who were admitted within 12 h of the onset of their ST-segment elevation myocardial infarction symptoms, were prospectively recruited. Circulating catestatin was measured by ELISA. All patients received echocardiography examination during the first week; 51 patients received a re-examination of echocardiography at 3rd month after myocardial infarction.

Results Plasma catestatin on the time of admission was significantly higher than normal controls. The level increased further during the first week of AMI. At 3rd month after AMI, the plasma level of catestatin was comparable to normal controls. The plasma level of catestatin. Was correlated with anterior AMI and left ventricular ejection fraction (LVEF) in acute stage. Correlation analysis showed that plasma level of catestatin on admission, on day 3, day 7 and plasma level of BNP on day 7 closely correlated with indexes of ventricular remodelling at 3rd month after the onset of AMI.

Conclusions Plasma catestatin levels elevated after acute myocardial infarction. Early elevation of catestatin correlated with anterior myocardial infarction and LVEF plasma catestatin after the onset of AMI could predict the magnitude of progressive ventricular remodelling 3 months after acute myocardial infarction.

Conclusions Plasma YKL-40 levels were significantly increased in patients with CAD. A promoter polymorphism (−131C>G) in CHI3L1 gene was associated with circulating levels of YKL-40, but not with coronary artery disease in Southern Han Chinese. Future research is needed to confirm the present findings, by replicating this association in independent populations of various ethnic origins, especially in large-scale prospective cohort studies.

Objectives Recent studies have shown that YKL-40 is a new biomarker in patients with coronary artery disease (CAD). YKL-40 is a chitinase-like glycoprotein encoded by the chitinase 3-like 1 gene, CHI3L1, that is localised at a highly conserved area on chromosome 1q32.1. The polymorphisms in the promoter of CHI3L1, −131 C>G (rs4950928), was reported to be associated with the inflammatory-mediated disease asthma and a decreased serum level of YKL-40. We recently showed that plasma YKL-40 levels are significantly increased in patients with CAD. In this study, we intended to investigate whether the SNP −131 C>G (rs4950928), which affect the serum level of YKL-40, is associated with CAD.

Methods

Results Significant clinical correlates of YKL-40 plasma levels were sex, age, cigarette smoking, hypertension, hyperlipidaemia and diabetes. Compared with a control group, plasma YKL-40 and hsCRP levels were significantly higher in CAD group (36.46±27.42 ng/ml vs 71.79±104.85 ng/ml, p<0.01, and 3.72±20.06 mg/ml vs 20.20 ±57.70 mg/ml, p<0.01, respectively). The CHI3L1-131G allele was significantly associated with reduced plasma YKL-40 levels in a recessive genetic model (OR, 0.484; 95% CI 0.264 to 0.889; p=0.02), but not with CAD in Southern Han Chinese in a linear logistic regression model after adjustment for the conventional risk factors for CAD (OR, 0.865; 95% CI 0.285 to 2.62; p=0.799). Different LD of CHI3L1 promoter between European and Chinese: the results confirmed perfect LD in the European population with R²=1, but the LD was disturbed in Chinese.

Conclusions Plasma YKL-40 levels were significantly increased in patients with CAD. A promoter polymorphism (−131C>G) in CHI3L1 gene was associated with circulating levels of YKL-40, but not with coronary artery disease in Southern Han Chinese. Future research is needed to confirm the present findings, by replicating this association in independent populations of various ethnic origins, especially in large-scale prospective cohort studies.

Objectives To evaluate prognostic value of circulating catestatin (CST) on hospitalised patients with acute myocardial infarction.

Methods The data of 125 patients with AMI were collected from the Second Hospital of Shaxi Medical University and Taiyuan central hospital during the period November 2010 to July 2011. Recording age, gender, body mass index, smoking history, past medical history, blood pressure, heart rate, Killip class at the time of admission, various biochemical index, cardiac ultrasonography the incidence of malignant events etc. The malignant events of this research included malignant arrhythmia, heart failure, angina or reinfarction, death. The patients were categorised into 4 groups according to CST (pg/ml) quartile. Clinical features, therapeutic approaches and the incidence of heart failure, malignant arrhythmias and death during hospitalisation were compared among groups. At the same time the patients were grouped into whether AMI with heart failure, malignant arrhythmias, if AMI with heart failure, were divided into three subunits according to Killip class. CST, NE, NT-proBNP were compared among groups. Multivariate logistic regression analysis was applied to determine the association between risk factors and in-hospital malignant events occurred. Receiver-operator characteristic (ROC) curve was performed to evaluate the power of CST on predicting in-hospital malignant events occurred.

Results

1. Clinical features: Patients with higher CST values were more likely to be older, to have lower body mass index and ejection fraction; to have higher white blood cell count, CysC, hs-CRE, NE, NT-proBNP value; to more likely have past history of angina, past history of diabetes mellitus; to more diuretic users (p<0.05).

2. In-hospital malignant events: Higher CST levels were associated with increased risk of heart failure, malignant arrhythmias and death (p<0.05). The area under the ROC curve of CST was 0.729, 95% CI 0.640 to 0.817, when CST=72.65 (pg/ml), had the best sensitivity (92.7%) and specificity (72.9%). After multivariate adjustment age, CST, NT-proBNP remained to be independent risk factors for increased in-hospital malignant events.

3. AMI with heart failure: CST and NT-proBNP levels were higher in AMI with heart failure (p<0.01). CST, NE, NT-proBNP levels were increased in proportion to increasing Killip grades (II–IV). The area under the ROC curve of CST was 0.714, 95% CI 0.638 to 0.791, when CST=70.08 (pg/ml), had the best sensitivity (95.6%) and specificity (70.6%). After multivariate adjustment age, history of heart failure, hs-CRE, CST, NT-proBNP remained to be independent risk factors for increased in-hospital heart failure occurred.

4. AMI with malignant arrhythmias: CST, NE, NT-proBNP levels were higher in AMI with malignant arrhythmias (p<0.05). The
ABSTRACTS

area under the ROC curve of CST was 0.725, 95% CI 0.629 to 0.820, when CST=70.35 (pg/ml), had the best sensitivity (96.9%) and specificity (78.7%). After multivariate adjustment pathoglycemia, CST remained to be independent risk factors for increased in-hospital malignant arrhythmias occurred.

Conclusions
1. The plasma CST level is an independent predictor to in-hospital malignant events and to some extent CST provides incremental prognostic information to conventional cardiovascular risk marker for patients with AMI.
2. The plasma CST level is an independent risk factor for heart failure occurred during hospitalisation in patients with AMI.
3. The plasma CST level is significant associated with in-hospital malignant arrhythmias occurred.

GW23-e0955  NON-ENZYMATIC NITRIC OXIDE SYNTHESIS PEROXIDE INDUCED BY ULTRASOUND MEDIATED MICROBUBBLES
doi:10.1136/heartjnl-2012-302920j.35
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Objectives Whether ultrasound mediated microbubbles could enhance the product by non-enzymatic pathway will be discussed in this chapter.

Methods Mix Laevo-arginine (L-Arg) with hydrogen peroxide (H2O2) by the concentration rates 1:1, 10:1, 100:1, 1:0, irradiates with ultrasound for 60 s. (frequency: 1MHz, output power: 0.5, 1, 1.5 W/cm2), and test the formation of nitric oxide (NO).

Results The experimental group generates the most NO of all groups, ultrasonography group was better than microbubbles group and blank control group, microbubbles group and blank control are normal. Besides, NO product has positive relation with output power in local range.

Conclusions Ultrasound mediated microbubbles could enhance NO product by non-enzymatic pathway.

GW23-e1589  ASSOCIATION BETWEEN SERUM SULFATIDE AND CAROTID INTIMA MEDIA THICKNESS IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLAEMIA
doi:10.1136/heartjnl-2012-302920j.36
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Objectives There is a positive association between sulfatide and atherosclerosis in an animal model for human familial hypercholesterolaemia. There are also association between sulfatide and vascular neointimal thickening in human. We investigated the relationship between sulfatide and carotid intima–media thickness (IMT) in heterozygous familial hypercholesterolaemia (FH) subjects.

Methods 55 genetically-verified heterozygous patients with FH and 34 healthy controls were recruited into our study. We measured serum sulfatide levels, the carotid IMT, and conventional cardiovascular risk factors including obesity parameters, blood pressure, fasting blood glucose, and lipid profiles.

Results Subjects with heterozygous FH had significantly elevated serum sulfatide, elevated total cholesterol, low-density lipoprotein cholesterol, and increased carotid IMT compared with control subjects. In patients with FH, univariate analysis showed that serum sulfatide was highly correlated with carotid IMT. Multiple linear regression analysis indicated that serum sulfatide was the only independent predictor of carotid IMT in patients with FH.

Conclusions Patients with heterozygous FH had significantly higher carotid IMT and the level of serum sulfatide was independently associated with atherosclerotic progression. (R: 0.659, R2: 0.408, p<0.001).

GW23-e1590  EFFECTS OF AUTOLOGOUS BONE MARROW MONONUCLEAR CELLS TRANSPLANTATION VIA CORONARY ARtery IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION ASSESSSED BY MRI
doi:10.1136/heartjnl-2012-302920j.37
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Objectives The aim of this study was to use an ‘one-stop’ non-invasive imaging examination-MRI to evaluate the feasibility and safety of aBM-MNC transplantation in patients with acute myocardial infarction (AMI) undergoing percutaneous coronary intervention.

Methods We did a randomised, double-blind, placebo-controlled study in 60 patients (male=43, female=17, age 52.18±4.98 years) with AMI. The patients were randomly divided into 2 groups (group A: PCI+aBM-MNC, group B: PCI only). Preoperative global left ventricular functions and scar tissue were measured by MRI. The therapeutic effects were assessed by MRI 6-month after aBM-MNC transplantation.

Results ALL the patients were treated without major complications. There is no evidence of new ventricular arrhythmia or neo-plasia. The LVEF was improved 28.5% in group A, while 18.4% in group B (p<0.01), IVEDV/m2 and LVESV/m2 were decreased by 21.15±5.96 ml/m2 and 27.14±4.48, respectively, which were significantly different from that in group B (5.85±6.18 ml (p=0.08) and 9.18±4.84 (p=0.04)). The cardiac output (CO), cardiac index (CI) and cardiac mass (CM) didn’t show significant difference between the two groups. Compared with group B, aBM-MNC group was associated with no significant reduction in myocardial infarct size (15.3% vs 12.7%, p=0.51).

Conclusions Comprehensive in vivo CMR reveals reversed remodel ing and improved systolic function and scar characteristics after aBM-MNC transplantation. PCI+aBM-MNC transplantation can lead to comparable improvements of left ventricle in acute myocardial infarction.

GW23-e1111  EVALUATION THE ALTERATION OF MITRAL VALVE STRUCTURES IN FUNCTIONAL MITRAL REGURGITATION USING REAL-TIME THREE-DIMENSIONAL TRANSSESOPHAGEAL ECHOCARDIOGRAPHY
doi:10.1136/heartjnl-2012-302920j.38
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Objectives To investigate the geometric alterations of the mitral leaflets (MV) and annulus (MA) in different heart disease using real-time three-dimensional transesophageal echocardiography (RT-3DTEE), and to clarify the effect of MV structures’ changes in FMR occurrence.
Methods: Twenty-five patients with paroxysmal supraventricular tachycardia, 25 isolated paroxysmal atrial fibrillation patients and 20 old myocardial infarction patients without functional mitral regurgitation (FMR) were enrolled as controls, 20 ischaemic cardiomyopathy cases with FMR were ICM group. Standard RT-3DTEE evaluations were performed. All data were exported to Tomtec MV analysis software for advanced quantification of MA, MV. The parameters include: (1) MA: anterior-posterior diameter (APD), anterolateral-posteromedial (ALPMD), three dimensional annulus circumference (3DAC), two dimensional annulus area (2DAA), three dimensional annulus area (3DAA), sphericity Index (SI), non-planar angle (NPA), two dimensional annulus area fraction (2DAAF). (2) MV: tenting volume (TV); tenting height (TH); commissural diameter (CD), anterior leaflet area (ALA), posterial leaflet area (PLA), tenting volume index (TVI), tenting volume fraction (TVF), coaptation index (CI).

Results: There were significant difference of APD, ALPMD, NPA, AC, 2DAA, 3DAA, TV, TH, CD, ALA, PLA, TVI, CI, AAF in different groups (F>3.84, p<0.05). Correlation analysis revealed significant negative correlations between left ventricular dimension, left atrial dimension, left ventricular ejection fraction and MA, MV parameters except for SI, TVF and NPA (p<0.05).

Conclusions: Our study found the geometric and function alteration of MA and MV not only the final way of FMR, but also make the FMR worsen. The application of a series of new quantitative parameters in this study, including NPA, TVI, CI, increase the comparability of individuals and evaluate accurate the change of mitral valve structures. These will helpful to make up the appropriate FMR therapeutic plans and assess the prognosis.

GW23-e2297  SERUM EXPRESSION LEVELS OF GDF-15 IN PATIENTS WITH CAD

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Objectives

1. To determine the serum expression levels of GDF-15 in peripheral blood among Group STEMI, NSTEMI, UA, CAD, non-CAD by ELISA.
2. To investigate the relationships between GDF-15 and severity/characteristics of coronary artery lesions.
3. To investigate the relationships between CDF-15 and hsCRP & left ventricular function.
4. To evaluate whether GDF-15 could be an index of efficacy and prognosis post PCI therapy for Acute Coronary Syndrome.

Methods

1. After informed consent was obtained, 200 patients with coronary artery diseases (according to the conditions on admission, the patients were divided into Group STEMI, NSTEMI, UA and SA) and 100 patients with normal coronary arteries were collected form 2010 - 2011 in Cardiovascular Medicine Department of the People’s Hospital of Haikou City, all of the cases were confirmed by coronary arteriography. The clinical characteristics and ECG findings on admission were recorded.
2. The severity of coronary artery lesions were assessed by Gensini scores. The left ventricular ejection fraction was determined by echocardiogram.
3. The levels of GDF-15, hs-CRP on admission were determined by ELISA, and for patients receiving PCI therapy for Acute Coronary Syndrome, the serum GDF-15 level was determined 1, 3, and 12 months post discharging.
4. The SPSS14.0 software was used for data analysis.
The serum GDF-15 level could serve as a serological index of
the severity (Gensini scores, divided into 3 categorisations: <=20; 20–40; >40) of artery lesions.

The serum concentration of GDF-15 was positively correlated to the high-sensitivity C-reactive protein (hsCRP) in CAD group.

There was statistically significant difference or not. Other medications have been maintained consistent.

The PCI therapy group was followed up, and the serum GDF-15 was rechecked 1, 3, and 12 months later, it was seen that the GDF-15 level was significantly decreased post therapy, while it remained high in patients who experienced end-point events. So, the GDF-15 could serve as a serological index of efficacy and prognosis (compared with the GDF-15 level on admission).

Conclusions
1. The GDF-15 level was 366.67±261.36 ng/l in non-CAD group, 766.29±171.62 ng/l in CAD group, 629.84±136.30 ng/l in SA group, 821.15±196.20 ng/l in ACS group, 718 ±112.70 ng/l in STEMI group, 625.85±108.50 ng/l in NSTEMI group and 580±196.90 ng/l in UA group.
2. The PCI therapy group was followed up, and the serum GDF-15 was rechecked 1, 3, and 12 months later, it was seen that the GDF-15 level was significantly decreased post therapy, while it remained high in patients who experienced end-point events. So, the GDF-15 could serve as a serological index of efficacy and prognosis (compared with the GDF-15 level on admission).

Conclusions
1. The serum level of sCD40L of the high dose group was significantly lower than that of the low dose group on the overall situation, and p=0.045, there is statistical significance.
2. The serum level of hs-CRP of the high dose group was significantly lower than that of the low dose group on the overall situation, and p=0.012, there is statistical significance.
3. We have detected the changing tendency of the serum levels of sCD40L and hs-CRP, p<0.001.It has a significant correlation. Pearson correlative coefficient is 0.125. The correlative coefficient is greater than 0. There is a positive correlation.

Conclusions
1. The serum level of sCD40L of the high dose group was significantly lower than that of the low dose group on the overall situation. It hints that the inhibition on the sCD40L of high dose of clopidogrel is stronger than that of the low dose of clopidogrel.
2. The serum level of hs-CRP of the high dose group was significantly lower than that of the low dose group on the overall situation. It hints that the inhibition on the hs-CRP of high dose of clopidogrel is stronger than that of the low dose of clopidogrel.
3. The changing trend of the levels of the serum sCD40L and hs-CRP is positive correlation. It hints when clopidogrel inhibits the generation of the inflammatory reaction product of hs-CRP it also inhibits the generation of the inflammatory reaction product of sCD40L.

GW23-e0903 THE INFLUENCE OF HIGH FIRST DOSE AND STANDARD DOSE OF CLOPIDOGREL ON THE LEVELS OF sCD40L AND hs-CRP IN THE SERUM OF THE PATIENTS WITH ACS AFTER INTERVENTIONAL PROCEDURES

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Objectives Discuss the influence of High loading dose and standard dose of clopidogrel on serum sCD40L, hs-CRP levels in acute coronary syndrome patients after intervention operation and post-operative cardiovascular events for 1 month.

Methods We have included 198 patients with acute coronary syndrome (ACS) that excluded the patients combined with diseases that can influence serum sCD40L and hs-CRP levels and we have used totally random method to divide the patients into two groups equally. Group A (high dose group: high loading dose of clopidogrel group) use 600 mg clopidogrel as loading dose and 150 mg clopidogrel daily for 7 days and 75 mg clopidogrel daily for maintenance treatment. Group B (low dose group: the standard dose group) use 300 mg clopidogrel as loading dose and 75 mg clopidogrel daily for maintenance treatment. All patients have been detected serum sCD40L and hs-CRP levels before taking clopidogrel, at preoperative PCI, postoperative PCI for the first day, for the seventh day, for 1 month.

We have observed the difference of the serum sCD40L and hs-CRP levels of the two groups, and have recorded the cardiovascular events of the patients at later time, and saw there is a statistical difference or not. Other medications have been maintained consistent.

Results
1. The serum level of sCD40L of the high dose group was significantly lower than that of the low dose group on the overall situation, and p=0.045, there is statistical significance.
2. The serum level of hs-CRP of the high dose group was significantly lower than that of the low dose group on the overall situation, and p=0.012, there is statistical significance.
3. We have detected the changing tendency of the serum levels of sCD40L and hs-CRP, p<0.001.It has a significant correlation. Pearson correlative coefficient is 0.125. The correlative coefficient is greater than 0. There is a positive correlation.

Conclusions
1. The serum level of sCD40L of the high dose group was significantly lower than that of the low dose group on the overall situation. It hints that the inhibition on the sCD40L of high dose of clopidogrel is stronger than that of the low dose of clopidogrel.
2. The serum level of hs-CRP of the high dose group was significantly lower than that of the low dose group on the overall situation. It hints that the inhibition on the hs-CRP of high dose of clopidogrel is stronger than that of the low dose of clopidogrel.
3. The changing trend of the levels of the serum sCD40L and hs-CRP is positive correlation. It hints when clopidogrel inhibits the generation of the inflammatory reaction product of hs-CRP it also inhibits the generation of the inflammatory reaction product of sCD40L.
is still under controversy. The present study was performed to investigate the alteration of electrophysiological characteristics in infarcted myocardium after Gel injection at the acute phase of MI.

Methods New Zealand White Rabbits (2.5±0.5 Kg) were used and divided into sham operation (SO) group accepted Gel or phosphate-buffer saline (PBS) and MI group accepted Gel or PBS. After left anterior descending coronary artery (LAD) was ligated, 200 μl 3% (w/v) Gel or PBS solution was injected around the infarcted myocardium by intra-myocardial injection. Rabbits in SO groups were subjected to the same procedure except that the silk suture around LAD was loose. Effective refractory period (ERP), monophasic action potential duration at 90% repolarisation (MAPD90) and transmural dispersion of repolarisation (TDR) were measured in three layers myocardium respectively by programmed electrical stimulation at 30 min, 3 h, and 6 h after injection. Arrhythmias were recorded by surface electrocardiogram during the surgery.

Results Data manifested that ERP of left ventricle was significantly shortened post-MI, but the alteration can be reversed after Gel injection. MAPD90 in infarcted myocardium was significantly shortened, especially in mid-myocardium. Gel can homogeneously prolong MAPD90 in three layers of myocardium and consequently, Gel inhibited repolarisation heterogeneity post-MI. In addition, Gel blunted the increasing of TDR post-MI and the effects were continuously enhanced as time goes on. Besides, that, arrhythmias score indicated the use of Gel obviously reduced the occurrence of ventricular malignant post-MI.

Conclusions As a non-bioactive biomaterial, poly N-isopropylacrylamide thermoresponsive hydrogel injected into normal or damaged myocardium is safe. Additionally, intra-myocardial injection of the thermoresponsive hydrogel could promote electrophysiological repair of infarcted myocardium due to the amelioration of electrical heterogeneity among the three layers of myocardium. We deem that the thermoresponsive hydrogel potentially inhibit malignant arrhythmias by reducing reentry, furthermore, it is a suitable consideration for MI therapy strategy.

GW23-e0458 EFFECT OF POSTCONDITIONING AND DELAYED POSTCONDITIONING ON ENDOTHELIAL FUNCTION IN ELDERLY PATIENTS WITH CORONARY DISEASE DURING ISCHAEMIA-REPERFUSION

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Objectives Although successful restoration of blood flow is mandatory of salvage of ischaemic tissue, reperfusion can paradoxically place tissue of further injury. The aim of this study was to observe the effect of postconditioning and delayed postconditioning on endothelial function in elderly patients with coronary disease during forearm ischaemia-reperfusion (IR).

Methods Fifty-four elderly patients (average age: 66.44±5.49 years) with coronary disease were recruited in this study, and randomised to three groups, IR group, postconditioning group and delayed postconditioning group. Brachial artery endothelial function was assessed by ultrasound to measure flow-mediated dilation (FMD). FMD was measured before and after IR (20 min of arm ischaemia followed by 20 min of reperfusion). Postconditioning group were given postconditioning (three cycles of 30-s reperfusion followed by 30-s reocclusion) within 1 min of reperfusion, and the delayed postconditioning group were given the procedure more than 1 min after the onset of reperfusion.

Results There were no significant difference between the three groups in age, sex, plasma lipid, smoking rate, morbidity of hypertension and diabetes mellitus. The baseline arterial diameter and FMD before IR had no difference between the three groups (IR: 3.84±0.66, postconditioning: 3.76±0.68, delayed postconditioning: 3.80±0.72, p=0.05). Flow-mediated dilation was reduced by IR in the three groups (IR: 8.37±2.76 vs 3.05±0.91, p<0.05; Postconditioning: 8.22±2.48 vs 6.70±2.36, p<0.05; Delayed postconditioning: 8.52±2.35 vs 3.17±1.04, p<0.05). FMD of Postconditioning group was much higher than that of the IR group (6.70±2.36 vs 3.05±0.91, p<0.05), while no protection was observed when the application of postconditioning was delayed for 1 min after the onset of reperfusion (3.17±1.04 vs 3.05±0.91, p>0.05).

Conclusions Endothelial function was damaged by IR. Postconditioning applied within 1 min of reperfusion might protect against endothelial IR injury, while the protective effect disappeared when the postconditioning applied more than 1 min after the onset of reperfusion.

GW23-e1168 THE EFFECTS OF ATORVASTATIN WITH DIFFERENT DOSES ON SLOX-1 AND H2S IN ACUTE CORONARY SYNDROME

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Objectives To investigate the effects of atorvastatin with different doses on soluble lectin-like oxidised low-density lipoprotein receptor-1 (sLOX-1), 8-isoprostane, hydrogen sulphide (H2S) and nitric oxide (NO) in patients with Acute Coronary Syndrome (ACS).

Methods 107 cases in the Second Affiliated Hospital of Dalian Medical University from 2010-2011 were enrolled in this study. 89 patients with ACS were randomised into atorvastatin 20 mg/d or 40 mg/d for 1 week. 18 healthy patients were chosen as control group. The levels of serum sLOX-1, 8-isoprostane and plasma H2S were measured by ELISA, the levels of serum NO was assayed by nitrate reduction method.

Results The serum levels of sLOX-1, 8-isoprostane in ACS group were obviously higher than that in control group. The levels of sLOX-1 showed a positive correlation to the serum levels of 8-isoprostane (r=0.83, p=0.00), the levels of H2S and NO decreased in patients with ACS.

Conclusions The levels of sLOX-1 and 8-isoprostane are upregulated, that of H2S and NO reduce in patients with ACS. Atorvastatin could decrease the levels of serum sLOX-1 and 8-isoprostane, increase the levels of H2S and NO, and atorvastatin with 40 mg/d has more effects.
GW23-e0455  MAJOR ADVERSE CARDIAC EVENTS AND CORONARY PLAQUE CHARACTERISTICS

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Objectives Major adverse cardiac events (MACE) often occur suddenly resulting in high mortality and morbidity. Analysing the characteristics of coronary plaque by Coronary CT Angiography (CCTA) may help forecasting the MACE.

Methods The patients who underwent CCTA from Jan.2008 to Feb.2010 were consecutively enrolled in the study. The hospital data base was screened for patients who later developed acute ST elevated myocardial infarction (STEMI) or non ST elevated acute myocardial infarction (NSTEMI) or cardiac death. The definition of the plaque score as follow: 1. Minor plaque 1 point; 2. Moderate plaque 2 points; 3. Severe localised stenosis 3 points; 4. The erosive plaque 5 points; 5. Calcification 1 point; 6. DES 5 points. 7. Plaque with positive remodeling 3 points. 8. Complete occlusion 3 points; 9. Diffused moderate lesions 2 points. Two-way analysis of variance was performed.

Results A total of 8557 consecutive cases of CCTA were performed in the institution. Among them 25 patients was found to develop MACE after CCTA, including 6 cases of deaths, 2 cases of heart failure, 11 cases of STEMI and 6 cases of NSTEMI. One way ANOVA analysis showed that advanced age, AF, past history of PCI, low Hb, tachycardia and high Grace Score contributed to death and heart failure. The differences were significant, p<0.05. The patients who had erosion plaques and high degree localised lesions had high likelihood of developing MACE, 98% CI 0.6472 to 1.538., p=0.000. The death and heart failure had the highest plaque score, 98% CI 0.4882 to 1.579, p=0.000.

Conclusions The plaque characteristics identify high risk patients.

GW23-e0456  PREDICTION OF MAJOR ADVERSE CARDIAC EVENTS BY CLINICAL PLAQUE SCORE

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Objectives Major adverse cardiac events (MACE) often occur suddenly resulting in high mortality and morbidity. A modified clinical coronary plaque score system incorporating both clinical variable and plaque variables may improve the accuracy of prediction.

Methods The patients who underwent Coronary CT Angiography (CCTA) from Jan.2008 to Feb.2010 were included in the study. The hospital data base was screened for patients who later developed acute ST elevated myocardial infarction (STEMI) or non ST elevated acute myocardial infarction (NSTEMI) or cardiac death. The plaque score system was established to quantify the lesions severity. The plaque score and the clinical variable were compared against the clinical MACE Score. Two-way analysis of variance and Pearson correlation were performed.

Results A total of 8557 consecutive cases of CCTA were performed in the institution. Among them 25 patients was found to develop MACE after CCTA, including 6 cases of deaths, 2 cases of heart failure, 11 cases of STEMI and 6 cases of NSTEMI. The clinical variables of haemoglobin, creatine, Grace Score, age, LVED, AF and Killip classification were closely related to Clinical MACE Score, p<0.05. The clinical Syntax Score achieved the highest correlation, R=0.852, p<0.001, followed by Clinical Plaque Score and Plaque Score, R=0.742 and R=0.746. After the stepwise regression analysis only Clinical Plaque Score remained in the regression equation, R=0.895, R square=0.798, Adjusted R square=0.764.

Conclusions Clinical Plaque Score accurately predict MACE.
neutrophils, preoperative creatinine level, CTNI, time of continuous chest pain, ventricular tachycardia, coronary thrombosis, Tirofiban, intraoperative IABP, postoperative IABP, cardiac function killip classification. And negative correlations between hospital bleeding events and women, previously underwent PCI, smoking, EF; the numbers of abnormalities wall motion segment, haemoglobin and hospital bleeding events negatively correlated. The proportion of neutrophils, previous peptic ulceration, LV internal diameter, aneurysm formation, ventricular tachycardia, haemoglobin, age, EF; intraoperative IABP, postoperative IABP were revealed to be the leading correlated factors of hospital bleeding events to VIP analysis.

Conclusions: The proportion of neutrophils, previous peptic ulcer, LV internal diameter, aneurysm formation are important predictors for hospital bleeding events in acute ST segment elevation myocardial infarction undergoing emergency PCI.

Methods: A retrospective analysis on clinical manifestations and imaging features was performed in 16 cases with noncompaction of ventricular myocardium.

Results: There were not typical clinical manifestations and specificity changes of ECG in patients with noncompaction of ventricular myocardium. 12 cases underwent coronary angiography had no significant coronary stenosis. 10 cases had the heart shadow increased on chest X-ray. The diagnosis of MRI was consistent with of cardiac Doppler ultrasonography in 15 patients, but one case with right ventricular type based on MRI results was difficult to judge. Typical changes of noncompaction of ventricular myocardium were showed in Doppler echocardiography in all patients, which there were 12 cases with left ventricular type, two cases with double ventricular type and one case with right ventricular type.

Conclusions: Patients who had heart shadow increased with unknown causes and normal coronary angiography, should consider noncompaction of ventricular myocardium, and heart MRI and Doppler ultrasound can confirm the diagnosis.
GW23-e2381 VARIATION AND SIGNIFICANCE OF SERUM CARP IN PATIENTS WITH ATRIAL FIBRILLATION

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Objectives To investigate the changes and significance of serum levels of CARP in patients with atrial fibrillation (AF), and evaluate the relationship between CARP and AF

Methods 124 patients with hypertension or coronary heart disease were enrolled in this study, including atrial fibrillation group (n=64) and sinus rhythm group (n=60).

Results The levels of serum CARP in atrial fibrillation group were significantly higher than those in sinus rhythm group (p<0.05); the levels of serum CARP in Persistent AF were higher than those in Paroxysmal AF group (p<0.05); the levels of serum CARP in Paroxysmal AF were higher than those in sinus rhythm group (p<0.05).

Conclusions The level of serum CARP has a special significance in the progress of atrial fibrillation.

GW23-e2161 THE CHANGE OF SERUM LEVEL OF PIGMENT EPITHELIUM-DERIVED FACTOR IN CORONARY HEART DISEASE

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Objectives To investigate the change of serum level of Pigment epithelium-derived factor (PEDF) in coronary heart disease patients.

Methods 40 coronary heart disease patients, 29 males and 11 females were recruited into this study, which contains acute myocardial infarction 6 cases, unstable angina pectoris 15 cases, stable angina 19 cases, according to the New York Heart Association (NYHA) diagnostic criteria, ruling out infectious diseases, tumour, renal inadequacy, diabetes, Hepatic function damage, cardiac inadequacy, hyperpyrexia, anaemia and hyperthermy. Control group contains 35 healthy people with similar gender, age and social background. Venous blood on an empty stomach were drawn next day after admission and were put in tubes, and were centrifuge in 1000 rpm for 10 min, then blood serum were imbibed and stored under −80°C. The serum of normal control group were taken in 80°C. The serum of normal control group were taken in 80°C.

Results The levels of serum CARP (8.39 ±1.37 pg/ml) in control group were higher than those in sinus rhythm group (6.95 ±2.92 pg/ml) in control group (p<0.05). There was no deference between two groups in serum level of total cholesterol, triglyeride and lipoprotein cholesterol.

GW23-e0678 PRIMARY STUDY OF TWO STOP HYBRID IN THE TREATMENT OF MULTIVESSEL LESION IN PATIENTS WITH ACUTE CORONARY SYNDROME IN AGING

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Objectives Evaluate the feasibility and safety of two stop hybrid in the treatment of multivesSEL lesion in patients with acute coronary syndrome (ACS) in aging.

Methods Two stop hybrid was adapted to treat consecutive aging patients of ACS with multivesSEL lesion selected by following criteria: 1. Left anterior ascending artery (LAD) was totally occluded in more than 3 months and three was at least one lesion with more than 80% stenosis in left circus flexes branch (LCX) or right coronary artery (RCA). 2. Coronary artery bypass graft was not contraindicated. 3. Informed consent was written to obtain two stop hybrid in following sequence: the patient was received micro port robot LIMA-LAD bypass at first in surgery and then transferred to cardiology in 2 weeks to complete sirolimus eluting stent implantation in LCX or RCA.

Results Five patients (male 4, 67.52±4.16 years) were enrolled in the study. Their five LADs were occluded in 15.28±4.32 months. Three patients had 5 lesions in LCX and two had 4 lesions in RCA. Diabetes, hypertension and hyperlipidemia were complicated in 4, 3 and 5 cases respectively. Three were no histories of myocardial infarction and stroke. Left ventricular ejection fraction was 57.34 ±6.12%. Three were no death or cardiac events in 2 weeks’ bridge period between surgery and cardiology. Micro port robot LIMA-LAD bypass was success in all five patients with patient bypass confirmed by angiography during stent implantation. Sirolimus eluting stents were implanted successfully in total 9 lesions of LCX and RCA. There were no death or cardiac events during the follow-up of 18.73±5.94 months.

Conclusions Two stop hybrid is feasible and safe in selected aging patient of ACS with multivesSEL lesion. Large sample trial is needed to confirm long-term effect.

GW23-e0680 HIGH PRESSURE POST-DILATION IMPROVES IMPLANTATION QUALITY OF DRUG ELUTING STENTS

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Objectives Effect of high pressure post-dilation on implantation quality of drug eluting stents was evaluated by optical coherence tomography (OCT).

Methods Consecutive patients with acute coronary syndrome and type A lesion in left anterior descending coronary artery (LAD) were enrolled into the study. The nominate pressure of preloaded balloon was used to delivery sirolimus eluting stents. OCT was used then to obtain following parameters: 1. stent apposition rate (SAR). 2. minimal lumen diameter (MLD). 3. minimal lumen area (MLA). 4. maximal distance of strut to endovasculum (DSEmax). 5. apposition struts per centimetre (AS/cm). 6. mean distance of apposition struts to endovasculum (MDASE). Finally, non-compliant high pressure balloons were adapted to dilate the
implanted stents with 18 atm and OCT studies were repeated.

**Results**

Sixteen patients (male 9, 62.34±7.15 years) were enrolled into the study. Total 16 sirolimus eluting stents were implanted in LAD without death and complications. Mean stent length and diameter was 19.75±6.11 mm and 3.14±0.56 mm respectively. Comparison between OCT parameters before and after high pressure post-dilation was shown in table.

Nominant pressure dilation High pressure post-dilation p value
SAR 13.16 (81.25) 1/16 (6.25) <0.05
MLD 2.87±0.76 3.55±0.84 <0.05
MLA 3.25±0.92 3.82±0.81 <0.05
AS/cm 19.3±5.47 2.14±0.35 <0.01
DSEmax 423.51±67.49 51.43±13.25 <0.01
MDASE 317.56±78.24 83.42±21.93 <0.01

**Conclusions**

Stent apposition rate was 81.25% if nominate pressure was adapted to delivery drug eluting stent in type A lesion of LAD. This rate could be decreased 92.31% by post-dilation of 18 atm without non-compliant balloon.

**GW23-e1203**

**THERAPEUTIC EFFECTIVENESS AND SAFETY OF IMPLANTED DRUG ELUTING STENTS**

doi:10.1136/heartjnl-2012-302920j.57

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**Objectives**

Stenting of bifurcation lesions remains a challenging subset. The purpose of this study was to analyse the therapeutic effectiveness and safety of coronary bifurcation stenting.

**Methods**

Between Jan. 2005 and Jan. 2010, data were collected retrospectively on 74 patients with bifurcation lesion treated with coronary stenting in our institution. At least 6 months follow-up data were obtained and coronary angiogram was performed in the presence of clinical or stress test ischemia. The database was analysed to extract univariate predictors of acute and 6 months adverse events.

**Results**

A total of 74 patients were included, median age 60 years. The constituting ratio of pathological change contingents and involved positions among the two groups was notable difference, p<0.05. The target was the LAD-diagonal bifurcation in 49.2% of cases. Angiographic success (residual stenosis <30%) was obtained in 100% of cases for the main branch (MB) and side branch (SB) 100% (residual stenosis <50%). The ratio of restenosis in stents among the two groups wasn’t notable difference, p>0.05. The in-hospital and 6 months follow-up major adverse cardiovascular events (MACE) rate among the two groups was not notable difference, p>0.05.

**Conclusions**

provisional SB stenting strategy is a predictor of favourable outcome after coronary bifurcation stenting. It significantly reduce the rate of MACE as well as the need for repeat TVR at 6-month follow-up.

**GW23-e0936**

**THE EFFECT OF ATROVASTATIN ON THE QRS DURATION IN THE PATIENTS WITH ACUTE ANTERIOR ST ELEVATION MYOCARDIAL INFARCTION UNDERGOING PRIMARY ANGIOPLASTY**

doi:10.1136/heartjnl-2012-302920j.58

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**Objectives**

To evaluate the value of intensive atorvastatin treatment on changes of QRS duration and ventricular arrhythmia in the patients with acute anterior ST elevation myocardial infarction undergoing primary Angioplasty.

**Methods**

From December 2009 to December 2011, 150 consecutive patients admitted to the Cardiology Department of Tianjin Medical University General Hospital with the diagnosis of acute anterior STEMI within 12 h or if cardiogenic shock present within 24 h from the onset of symptoms and who underwent primary angioplasty of IRA were primarily enrolled in the study. All patients got 300 mg Aspirin, 600 mg clopidogrel oral loading and 20 mg or 80 mg atorvastatin before the interventional diagnosis and treatment. Then a routine standard procedure of coronary angiography (CAG) and percutaneous coronary intervention (PCI) was performed as soon as possible. PCI strategy was made by the individual interventional cardiologist. According to the loading dose of atorvastatin before operation, the patients were divided into 2 groups: routine dose group and intensive dose group, those having 20 mg atorvastatin loading before the interventional procedure formed the routine dose group, those having 80 mg atorvastatin loading before the interventional procedure constituted the intensive dose group. In routine dose group, patients took 20 mg atorvastatin per day after PCI, while in intensive dose group, patients took 40 mg atorvastatin per day after PCI. Pre- and postangioplasty thrombolysis in myocardial infarction (TIMI) flow grade were assessed in IRA according to the TIMI classification. The QRS duration in pre- and postangioplasty ECGs were measured manually with the help of a caliper and a magnifying lens in 5 consecutive beats for each of the infarct-related leads. Take the means of 3 consecutive beats. Electrocardiographic monitoring: Record the arrhythmia score from the onset of the operation to the end of primary PCI and from the end of primary PCI to 24 h after PCI in according with Lembeth Convention.

**Results**

Group A: Routine dose group, n=74; Group B: Intensive dose group, n=76. There were no difference between the 2 groups for the comparison of baseline clinical characteristics adjusted for age, gender, body mass index, symptom onset to balloon time, heart rate, history of heart failure, hypertension, diabetes mellitus, smoking, left ventricular ejection fraction, beta-blocker use, calcium-blockers, or ACE inhibitor use. There are no differences between the two groups in terms of pre-procedure QRS duration (p>0.05). After intervention, QRS duration decreased from 95.93±7.22 to 86.14±7.22 in group A, from 96.79±8.15 to 85.7±8.17 in group B, paired t test showed the shorting of QRS duration after primary PCI compare to it at administration in the two groups were significant (p<0.01). Shortening of QRS duration was more evident in the intensive dose group than the routine dose group (11.09±2.19 vs 9.8±2.6, p<0.01).

The results showed the arrhythmia scores were 2 (1, 2) in routine dose group and 1 (0, 2) in intensive dose group. In 24 h after procedure, the arrhythmia scores were 2 (1, 5) in routine dose group and 1 (0, 2) in intensive dose group. Mann-Whitney test showed that intensive atorvastatin therapy before interventional procedure compared with routine dose atorvastatin therapy can significantly reduce the ventricular arrhythmia score in interventional procedure (p<0.01) or in 24 h after procedure (p<0.01).

In routine dose group. There are 6 patients got TIMI III flow after primary PCI, and the other 68 patients got TIMI III blood flow. In intensive dose group, there are 3 patients got TIMI III flow after primary PCI, and the other 73 patients got TIMI III blood flow. There were no significant difference (χ²=0.531, p>0.05).

**Conclusions**

The present study supports that intensive administration of atorvastatin in patients with STEMI undergoing primary angioplasty has more intensive effect in shorting the QRS duration and antiarrhythmic effect.
GW23-e0058 Efficacy and tolerability of amlodipine/telmisartan combination therapy in hypertensive patients with cardiovascular risk factors
doi:10.1136/heartjnl-2012-302920j.59

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Objectives Most patients with hypertension require more than one drug to attain recommended blood pressure (BP) targets. Initiating therapy with two agents is recommended for patients at high risk of a cardiovascular event or with a BP >20/10 mm Hg above goal. OBJECTIVE: To demonstrate the efficacy and tolerability of amlodipine/telmisartan combination therapy in hypertensive patients with cardiovascular risk factors.

Methods After a washout period of 2 week, all patients with mean sitting diastolic blood pressure (MSDBP) of 90–109 mm Hg and/or mean sitting diastolic blood pressure (MSDBP) of 90–109 mm Hg were randomised to receive a design to the two treatment comparisons: amlodipine 2.5 mg once daily (o.d.) and amiloride/hydrochlorothiazide 1.25/12.5 mg o.d. (Group A) or amlodipine 2.5 mg o.d. and telmisartan 40 mg o.d. (Group B). Following the initial 2 week treatment period, patients were force titrated to amlodipine/telmisartan 5/80 mg o.d. or amiodipine/amiloride/hydrochlorothiazide 5/2/25 mg o.d for the remainder of the trial. Primary efficacy variables were change from baseline in MSSBP and MSDBP after a washout period of 2 week, all patients with mean sitting systolic blood pressure (MSSBP) of 140–179 mm Hg and/or mean sitting diastolic blood pressure (MSDBP) of 90–109 mm Hg were randomised to receive a design to the two treatment comparisons: amlodipine 2.5 mg once daily (o.d.) and amiloride/hydrochlorothiazide 1.25/12.5 mg o.d (Group A) or amlodipine 2.5 mg o.d. and telmisartan 40 mg o.d. (Group B). Following the initial 2 week treatment period, patients were force titrated to amlodipine/telmisartan 5/80 mg o.d or amlodipine/amiloride/hydrochlorothiazide 5/2/25 mg o.d for the remainder of the trial. Primary efficacy variable was change from baseline in MSSBP and MSDBP at study end. Secondary efficacy variables included control rate (MSSBP <140 mm Hg and MSDBP <90 mm Hg). Safety was also assessed.

Results 54 (mean age: 59.5 years) were randomised. Statistically significantly greater reductions in MSSBP/MSDBP were observed in both group A (21.3/15.8 mm Hg, p<0.0001) and group B (21.6/16.1 mm Hg, p<0.0001). Control rates were higher in both combination therapy groups (99% and 94.5%, respectively). Peripheral oedema was the most frequent adverse event, reported in group A and persistent reductions in blood pressure were achieved. Control rates were higher in both combination therapy groups (99% and 94.5%, respectively). Peripheral oedema was the most frequent adverse event, reported in group A and persistent reductions in blood pressure were achieved. Control rates were higher in both combination therapy groups (99% and 94.5%, respectively). Peripheral oedema was the most frequent adverse event, reported in group A and persistent reductions in blood pressure were achieved. Control rates were higher in both combination therapy groups (99% and 94.5%, respectively). Peripheral oedema was the most frequent adverse event, reported in group A and persistent reductions in blood pressure were achieved.

Conclusions The combination of amlodipine/telmisartan in this 52-week study provided additional BP control and was well-tolerated in hypertensive patients with cardiovascular risk factors. Clinically significant and persistent reductions in blood pressure were achieved.

GW23-e1227 Evaluation of ischaemia modified albumin in diagnostic value of the congestive heart failure and its long-term prognosis
doi:10.1136/heartjnl-2012-302920j.61

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Objectives The study is to observe the changes of plasma ischaemia-modified albumin (IMA) in patients with cardiac dysfunction, and to evaluate its performance for predicting prognosis and long—term mortality in patients with congestive heart failure (CHF).

Methods One hundred and twenty-three patients with cardiac dysfunction admitted to Department of Cardiology of the First Affiliated hospital of Henan Chinese cultural medicine university from January 2010 to June 2011 were enrolled. All cases were divided into three groups according to NYHA classification. They are NYHA II, III, IV. We recorded the patient’s general condition, measured blood biochemical and the plasma IMA after admission. A median follow-up of mean 1 year, once 2 months was taken, and all case were divide into three groups according to results of median follow-up. They are A (live) B (death). The level of IMA was measured and analysed. Thirty healthy people detected IMA as control group.

Results The results showed that the serum level of IMA in patients with CHF were significantly increased (p<0.01) Compared with healthy control group. IMA level of cardiac function class II (55.23±8.99) U/ml was lower than that of class III (47.88±7.57) U/ml and class IV (40.52±7.98) U/ml (p<0.05). IMA level of group B was higher than that of group A. IMA in group of cardiac dysfunction has negative correlation with LVEF value (r=-0.679, p<0.01), and positive correlation with the heart function levels (r=0.597, p<0.05), showed no correlation with.

Conclusions The IMA can be a sensitive indicator for cardiac dysfunction. The IMA has an important valuation in diagnosis of heart failure level and its long-term prognosis.

GW23-e1209 Study on relativity between serum homocysteine level and coronary artery disease severity
doi:10.1136/heartjnl-2012-302920j.60

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Objectives To discuss the relationship between Serum homocysteine (Hcy) level and coronary artery lesion severity.

Methods 521 in hospital suspected cases with coronary heart disease (CHD) were collected from October 2008 to October 2010. 521 cases were divided into CHD group (384 cases) and non-CHD group (137 cases) diagnosed by angiography. Compare the difference of HCY, Acidum Folicum, Vit B12 among the two groups, and analysed the relationship between Serum homocysteine level and the degree of coronary artery disease. CHD group was divided to single, double and multi- vessel subgroups according to the severity of vascular lesions. Serum homocysteine levels were also compared among the three subgroups respectively.

Results 1. The CHD group serum homocysteine level (24.36±6.62 μmol/l) was significantly higher than non-CHD group (12.26±4.1 umol/l). Serum homocysteine level were positively correlated with TCH (p<0.01), negatively correlated with HDL (p<0.01), FA (p<0.01), Vit B12 (p<0.05).

2. The level of serum homocystein in three subgroups was higher than non- CHD group, the integration of serum homocystein increased with the number of vascular lesions increased gradually. The difference was significant (p<0.01).

3. high level of Serum homocystein and TCH, low level of Serum HDL, FA and Vit B12 were the risk factors of CHD using logistic regression analysis.

Conclusions The level of serum homocysteine can be used for indication of the degree of CHD in the clinical medicine.

GW23-e1959 Development and validation of the simplified Chinese version of Seattle angina questionnaire (SC-SAQ)
doi:10.1136/heartjnl-2012-302920j.62

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Objectives The Seattle Angina Questionnaire (SAQ) was widely used and well validated in the west countries. We aimed at...
validated the reliability and validity of its Chinese version, which is called the Simplified Chinese version of SAQ (SC-SAQ).

Methods SAQ was translated into Chinese according to the principles of psychometrics. Patients who went to our clinics presented with an angina completed SC-SAQ and SF-12. ECG, cTnI, coronary CTA, and cardiac angiography were performed where necessary.

Results One hundred and ninety-one patients completed the study. The Cronbach’s α and test-retest reliability of SC-SAQ was 0.92 and 0.98 respectively. Criteria validity was demonstrated with positive correlation of SC-SAQ with SF-12. Confirmed factor analysis (CFA) of SC-SAQ showed good construction validity.

Conclusions The Simplified Chinese version of SAQ (SC-SAQ) is reliable and valid condition-specific health-related quality of life questionnaire for CHD patients.

GW23-e1383 THE STUDIES ASSESSING STATIN IN CORONARY ATHEROSCLEROSIS PLAQUE PROGRESSION

doi:10.1136/heartjnl-2012-302920j.63

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Objectives to assess the effect of therapy with statins on plaques.

Methods searched eligible studies on PubMed, Embase databases and analysed them through Review Manager 5. The primary terminal point was the progression of plaque volume evaluated by intravascular ultrasound (IVUS). Weighted mean difference (WMD) was used as summary statistics for the results (continuous variables). Heterogeneity of the studies was analysed by Cochran’s Q statistics. Sensitivity of the studies was analysed by stratified analysis according to the time of follow-up, the level of LDL-C and statins. All of biases of the studies were analysed by funnel plot.

Results This meta-analysis adopted 19 studies from 14 papers. The total number of patients was 2631 and the mean follow-up was 18.7 months. That found a significant regression in coronary atherosclerotic plaque volume (WMD −6.59 mm³, 95% CI (−8.75 to −4.43) p<0.0001), with no significant heterogeneity across studies (p=0.78). Stratified analysis: Time of the follow-up >6 months (WMD −6.75 mm³, 95% CI (−9.10 to −4.40) p<0.0001) presented a trend for plaque regression through the follow-up ≤6 months (WMD −5.74 mm³, 95% CI (−11.20 to −0.28) p=0.04). Treatment with atorvastatin (WMD −6.88 mm³, 95% CI (−12.96 to −3.40) p<0.0001). At the end of follow-up, the LDL-C level on 80–100 mg/dl (WMD −8.88 mm³, 95% CI (−12.96 to −4.81) p<0.0001) reveal the strongest trend for plaque regression among all of the three LDL levels, including >80 mg/dl (−6.01 mm³, 95% CI (−8.22 to −3.21) p<0.0001), 80–100 mg/dl and <100 mg/dl (WMD −4.22 mm³, 95% CI (−10.27 to 1.82) p=0.017). Plaque volume remained essentially unchanged in patients not treated with statins (WMD 0.13 mm³, 95% CI (−4.42 to 4.68) p=0.96).

Conclusions statin therapy, particularly when achieving the LDL level on 80–100 mg/dl, appears to promote a significant regression of coronary plaque volume as measured by IVUS.

Acute coronary syndrome

GW23-e1453 INCREASED MONOCYTIC EXPRESSION OF UROKINASE RECEPTOR IN ACUTE CORONARY SYNDROME: A POTENTIAL MARKER OF CLINICAL INSTABILITY

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Objectives Urokinase receptor (uPAR) is highly expressed in atheromatous plaques and plays a crucial role in inflammation by modulating cell migration and matrix degradation. We hypothesise that uPAR is also increased in the circulating monocytes of patients with acute coronary syndrome (ACS) compared to patients with chronic stable angina (CSA) and may be a marker of clinical instability.

Methods Consecutive angina patients were prospectively assessed including 195 with ACS [80 ST elevation myocardial infarction (STEMI), 66 with non-ST elevation myocardial infarction (NSTEMI), 49 with unstable angina (UA)] and 37 with CSA. The percentage of uPAR expressing monocytes (PUEM) and the mean fluorescence intensity (MFI) index of uPAR were measured using a flow cytometer.

Results The PUEM (median and IQR) on admission was significantly higher in patients with ACS (49.53%, 22.69%–88.30%) than in patients with CSA (10.00%, 2.30%–19.47%, p<0.001). Within ACS subgroups, the PUEM was elevated to 40.27% (20.68%–58.30%) and 46.59% (14.25%–84.07%) in patients with UA and NSTEMI, respectively, and peaked at 64.32% (26.75%–93.18%) in patients with STEMI. PUEM was positively correlated with left main stem disease (p=0.04) and hs-CRP (p=0.003) in the whole patient group and was the only significant predictor of ACS (OR 8.11, 95% CI 2.81 to 23.43, p<0.001) together with hs-CRP (OR 3.55, 95% CI 1.53 to 9.38, p=0.01).

Conclusions Increased uPAR in circulating monocytes has an independent significant association with ACS. These findings suggest that an increase of monocytic uPAR may be a marker of atheromatous plaque vulnerability.

GW23-e2093 FEASIBILITY OF DETECTING MYOCARDIAL ISCHAEMIA USING THREE-DIMENSIONAL SPECKLE-TRACKING ECHOCARDIOGRAPHY

doi:10.1136/heartjnl-2012-302920k.2

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Objectives Strain imaging provides objective quantification of myocardial deformation, thus is a useful tool to detecting regional wall motion abnormalities caused by myocardial ischaemia. With the technologic advancement in real-time three-dimensional echocardiography, the three-dimensional speckle tracking echocardiography (3DSTE) based on high quality volume image has been developed very recently. We aim to investigate the value of the novel 3DSTE in detecting myocardial ischaemia.

Methods Forty-six patients with acute coronary syndrome were included and received coronary angiography (CAG). Patients were divided into myocardial ischaemia group (with >70% coronary stenosis in at least one main branch) and control group (without >70% coronary stenosis) according to the results of CAG. The conventional and 3D echocardiography was performed using a Vivid E9 ultrasound diagnosis platform (GE Vingmed Ultrasound, Chicago, US). Echo parameters were compared between groups. Ischaemic myocardium segments were defined as territory of coronary arteries with >70% luminal stenosis. ROC curve analysis was performed to evaluate the accuracy of wall motion score (WMS) and strain parameters for detecting ischaemic segments.
**Results** CAG results showed 26 out of 46 patients had >70% coronary artery stenosis. Speckle tracking were achieved in 94.8% (741/782) segments, with a total of 102 segments classified as ischaemic. The myocardial ischaemia group had significantly lower LVEF (66.1%±6.6% vs 49.8%±12.0%, p<0.001) and higher WMS index (1.01±0.03 vs 1.24±0.32, p=0.003) compared with control group. As for the strain parameters, global longitudinal strain (LS), circumferential strain (CS), radial strain (RS) and area strain (AS) were all impaired in myocardial ischaemia group (Global LS: −19.1%±3.1% vs −15.1%±3.2%, p<0.001; Global CS: −18.3%±2.5% vs −15.0%±5.0%, p<0.001; Global RS: 53.7%±10.3% vs 41.2%±9.6%, p<0.001; Global AS: −33.1%±4.1% vs −27.0%±5.2%, p<0.001). ROC curve analysis showed the sensitivity and specificity of conventional WMS to detect myocardial ischaemia is 54.9% and 93.3%, with an area under curve (AUC) of 0.744. All four strain parameters measured by 3DSTE were proved useful in detecting myocardial ischemia (LS: sensitivity 67.6%, specificity 78.7%, AUC 0.827; RS: sensitivity 81.4%, specificity 72.5%, AUC 0.856; CS: sensitivity 72.5%, specificity 84.5%, AUC 0.905), with the novel AS yield the highest accuracy.

**Conclusions** The novel AS derived by 3DSTE is a very accurate and reproducible index for detecting regional wall motion abnormalities caused by myocardial ischaemia.

**Objectives** To investigate the expression and function of CD4+CD25+ Treg on peripheral blood mononuclear cells in patients with acute coronary syndrome (ACS).

**Methods** There were 48 patients with ACS and 12 control subjects. Patients were classified into ST-segment elevation myocardial infarction (STEMI) patients (n=20), non-ST-segment elevation myocardial infarction (NSTEMI) patients (n=15), and unstable angina (UA) patients (n=13). Peripheral blood were collected from all subjects in a sterile state. PBMCs were prepared by ficoll density gradient for analysis of flow cytometry (FCM). Serum was obtained after centrifugation and stored at −80°C until further use. For the analysis of Treg cells, surface staining was performed by the use of CD4-prep, CD25-FITC, Foxp3-APC, and CTLA4-PE. Stained cells were assessed by FCM. The frequency of Treg (CD4+CD25+, CD4+CD25+Foxp3+ and CD4+CD25+ CTLA4+) cells was expressed as a percentage of CD4+ T cells by sequential gating on lymphocytes and CD4+ T cells. The levels of TGF-β1 in serum were examined by ELISA. Values were expressed as the mean±SD. Data were analysed by using SPSS 11.0. Statistical significance for the difference in the groups was assessed by one-way analysis of variance (ANOVA). p<0.05 was considered to be statistically significant.

**Results** There were no significant differences in age, gender, hypertension, diabetes mellitus, smoking rate, obesity among STEMI, NSTEMI, UA patients and the control. The frequencies of Treg cells were significantly lower in STEMI, NSTEMI, and UA patients than in the control [CD4+CD25+ /CD4+: 2.5±0.7% (3.5±0.6, 3.5±0.5, 5.8±0.6 (all p<0.05 vs control); CD4+CD25+Foxp3+/CD4+: 5.2±0.4, 3.2±0.4, 3.9±0.5 (all p<0.05 vs control); CD4+CD25+CTLA4+/CD4+: 0.9±0.3, 1.5±0.3, 1.6±0.4, 2.3±0.5 (all p<0.05 vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all p<0.05). The levels of TGF-β1 were significantly lower in in STEMI, NSTEMI, and UA patients than in the control [6.8±1.8 (pg/ml), 14.9±1.5, 15.1±2.2, 25.5±5.4 (all p<0.05 vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all p<0.05).

**Conclusions** The peripheral CD4+CD25+, the frequency of Foxp3, CTLA4 on CD4+CD25+ Treg cells, and serum concentration of TGF-β1 in patients with ACS were decreased. It suggested that the fall of expression and function of CD4+CD25+ Treg may contribute to the occurrence of ACS.

**Objectives** To analysis the hs-CRP concentrations in patients with acute coronary syndrome without history of infectious disease or cancer recently and without taking any lipid-lowering drugs 2 months before admission, were randomly divided into two groups: conventional treatment group (n=39) and tirofiban treatment group (n=41). The former group only gave the conventional therapy (low molecular weight heparin, clopidogrel and aspirin), but the latter group gave continuous infusion of tirofiban for at least 48 h on the basis of conventional therapy. The high-sensitivity C-reactive protein was measured by ELISA before treatment and at 3rd, 7th, 14th, 28th-day after treatment. The adverse cardiovascular events including death, myocardial infarction, repeated percutaneous coronary intervention, coronary artery bypass grafting and risk of bleeding within 30 days were observed as an endpoint. Statistical analysis was performed by SPSS16.0 for Windows. Measurement data were expressed as mean±SD (±s) and the differences between groups were analysed using t test. p<0.05 was considered statistically significant.

**Results** There were no significant differences in age, gender, hypertension, diabetes mellitus, smoking rate, obesity among STEMI, NSTEMI, UA patients and the control. The frequencies of Treg cells were significantly lower in STEMI, NSTEMI, and UA patients than in the control [CD4+CD25+ /CD4+: 2.5±0.7% (3.5±0.6, 3.5±0.5, 5.8±0.6 (all p<0.05 vs control); CD4+CD25+Foxp3+/CD4+: 5.2±0.4, 3.2±0.4, 3.9±0.5 (all p<0.05 vs control); CD4+CD25+CTLA4+/CD4+: 0.9±0.3, 1.5±0.3, 1.6±0.4, 2.3±0.5 (all p<0.05 vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all p<0.05). The levels of TGF-β1 were significantly lower in in STEMI, NSTEMI, and UA patients than in the control [6.8±1.8 (pg/ml), 14.9±1.5, 15.1±2.2, 25.5±5.4 (all p<0.05 vs control)]. These in the STEMI patients were also markedly lower than in the NSTEMI, and UA patients (all p<0.05).


**Conclusions** Hydrochloride tirofiban has strong immune and inflammatory inhibition in acute coronary syndrome, which provide a scientific basis for the clinical diagnosis and treatment of acute coronary syndrome and provide a reasonable treatment strategy.

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**GW23-e2544**

THE IMAGE QUALITY AND DIAGNOSTIC ACCURACY OF HIGH-PITCH DUAL-SOURCE CORONARY ANGIOGRAPHY USING FLASH SPIRAL MODE IN PATIENTS WITH HIGH HEART RATES

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**Objectives** To investigate the image quality, diagnostic accuracy and radiation doses of prospectively ECG-triggered spiral acquisition mode (Flash Spiral mode) coronary CT angiography (CCTA) using high-pitch dual-source CT in patients with high heart rates, compared with retrospectively ECG-gated spiral acquisition mode (Spiral mode) and catheter coronary angiography (CCA).

**Methods** One hundred and thirty-four consecutive patients with mean heart rate (HR) >65 beats per minute (bpm) who were performed CCTA using Flash Spiral mode setting at 20–80% of the R-R interval were included in this study as group A, while group B used Spiral mode to acquire data. Among them, there were 47 cases in group A (as group A1) and 45 cases in group B (as group B1) were underwent CCA. The general characteristics, image quality scores, the image noise, contrast-to-noise ratio (CNR) and effective radiation dose between two groups were assessed. Considered CCA as the standard of reference, the sensitivity, specificity, positive predictive value and negative predictive value of two groups were calculated.

**Results** There were no significant differences in general characteristics between the two groups (all p>0.05). The non-diagnostic coronary artery segments were no significant differences between group A and group B (segment-based analysis 1.52% vs 1.74%, p=0.345; patients-based analysis 7.5% vs 6.7%, p=0.812). There were no significant differences in the image quality scores (1.064±0.306 (group A) vs 1.084±0.327 (group B), p=0.063). The average image noise was 21.4±4.5 HU (range: 19–27 HU) and CNR was 12.1±4.2 (range: 6.4–25.3) in group A, and the corresponding numbers were 20.9±4.3 HU (range: 19–28 HU) and 13.3±5.1 (range: 7.1–28.2) in group B. There were no significant differences in image noise or CNR between the two groups. The average HR of score 5 in group A was significantly lower than that in group B (17.3±10.06 vs 23.89±32.94). The sensitivity, specificity and positive and negative predictive values of two groups were no significant differences. The average effective radiation doses of groups A was significantly lower than that of group B.

**Conclusions** In conclusion, in patients with high heart rates (>65 bpm), compared with the retrospectively ECG-gated spiral acquisition mode, the prospectively high-pitch spiral acquisition mode with image acquired timing set at 20–50% of the R-R interval provides a similar image quality and diagnostic accuracy, while being associated with significant reduction of radiation exposure in patients with high heart rates. The HRV is a considerable factor which affects the image quality of high-pitch dual-source CCTA in patients with high heart rates.

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**GW23-e0427**

EFFECT OF AUTOTLOGOUS BONE MARROW MONONUCLEAR CELLS TRANSPLANTATION IN DIABETIC PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

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**Objectives** To investigate the efficacy and proposed mechanism of bone marrow mononuclear cells (BMMNCs) transplantation for diabetic and non-diabetic patients with ST-segment elevation myocardial infarction (STEMI).

**Methods** One hundred and sixteen patients with STEMI who had successfully undergone percutaneous coronary intervention (PCI) were divided into a diabetic group (n=51) and non-diabetic group (n=65). All of the patients received intracoronary injection of BMMNCs.

**Results** Diabetes down-regulated IGF-1, IGFBP-5, VEGF, SDF-1, IL-6, IL-1α and TNF-α expression and affected the expression of Bmi-1, Gfi1, Tel and Hox-B4 which could prevent premature senescence and maintain the self-renewal capacity of stem cells. Event-free survival rates were not statistically different between the diabetic and non-diabetic group (50% vs 72.5%, p=0.382). IV ejection fraction (LVEF) and wall motion score index (WMSI) were evaluated by echocardiography and found to be significantly improved in the non-diabetic group compared to the diabetic group over the 4-year period.
follow-up period. Improved myocardial perfusion and reduced infarct size in the non-diabetic group compared to the diabetic group was verified using single-photon emission computed tomographic (SPECT) imaging. The non-diabetic group also had reduced anginal symptoms as assessed by changes in their Seattle Angina Questionnaire scores and Canadian Cardiovascular Society (CCS) Functional Angina classification. An improvement of 6-min walk distance (6MWD) was also noted to be higher in the non-diabetic group during the follow-up period.

Conclusions This study indicates that the beneficial effect of BMMNCs transplantation for STEMI is less pronounced in diabetic patients. The mechanism is associated with decreased BMMNCs function in diabetic patients.

**ABSTRACTS**

**GW23-e1483**

**ELECTRICAL STORM AS THE INITIAL MANIFESTATION OF AN ELDERLY PATIENT WITH ACUTE MYOCARDIAL INFARCTION (ONE CASE REPORT)**

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Objectives To investigate the characteristics and therapeutic method of electrical storm (ES) associated with acute coronary syndrome (ACS).

Methods The clinical data of one elderly patient with ES induced by ACS were collected and relevant literature were reviewed.

Results Case report A 73-year-old man manifested a sudden loss of consciousness when admitting to emergency department due to dizziness. Physical examination showed deep comatose; symmetric pupils with no responding to light at diameter of 4.5 mm; weak breathing and disappearance of main arteries pulsation. It was ventricular fibrillation (VF) with blood pressure of 0 on electrocardio monitoring. According to his family, the patient has been more than 10 years of hypertension, and BP is controlled at approximately 140/90. Initial ECG demonstrates no big difference before and after the treatment, while the effective cases are 44 (38%) and 44 (38%). The total rates of the two types are thus 94% and 93%, showing little statistical difference. As for the invalid cases in the two groups, after subjection to coronary angiography, 6 patients received PCI treatment, and the rest 3 patients continued their drug treatment.

Conclusions ES is one of the major electrophysiology pathogenesis to result in cardiac arrest and SCD. The aetiology of ES varies and myocardial ischaemia, especially ACS, is the most common cause. The onset of the ES is usually in the acute phase of ACS. The guideline[3]point out that, the only method to control ES is the intravenous β-blockers. Moreover, select a reasonable opportunity to revascularisation, is considered a fundamental means for treating and preventing ES associated with ACS.

This case may be the first report about electrical storm as the initial manifestation of an elderly patient with acute myocardial infarction. The good neurological outcome and the favourable short-term prognosis during 60-day follow-up of this patient are closely related with high quality CPR and advanced cardiovascular life support technologies in the first time. In addition, the high-energy (300-360J) biphasic waveforms defibrillation in the termination of VT/VF/ES caused by ACS has not been reported either. Once ES diagnosis was confirmed, shall clinical doctors take early high-energy biphasic defibrillation as the first consideration to improve the success rate of cardioversion? And compared with low-energy defibrillation, high-energy will lead to more myocardial damage and complications? All above are worth further exploration.

**GW23-e0885**

**CLINICAL RESEARCH OF FONDAPARINUX IN TREATING UNSTABLE ANGINA**

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Objectives To observe the immediate effect and security of fondaparinux in treating unstable angina.

Methods 232 patients with unstable angina were selected and randomly divided into Group A (116 cases) and Group B (116 cases). In addition to the normal treatment, Group A were given 2.5 mg fondaparinux per day subcutaneously for 7 days, while Group B were administered 5000 u low molecular weight heparin every 12 h for 7 days. The whole observation period lasts for 30 days. During this time, the frequency of disease development, change in its duration, ECG variation, myocardial infarction, incidence of sudden death, coagulation time changes and bleeding were observed.

Results Judging from the clinical effect, the significantly effective cases in Group A and B are respectively 65 (56%) and 64 (55%); while the effective cases are 44 (38%) and 44 (38%). The total rates of the two types are thus 94% and 93%, showing little statistical difference. As for the invalid cases in the two groups, after subjection to coronary angiography, 6 patients received PCI treatment, 7 suffered triple vessel disease, among whom, 4 accepted CABG treatment and the rest 3 patients continued their drug treatment. The thrombolastin time, platelet count and their occurring time demonstrates no big difference before and after the treatment, (p>0.05); in Group B, there is also no significant reduction in the number of platelet. Concerning the side effect, Group B is more serious than Group A in injection site bleeding, petechiae and incidence of pain (p<0.05) while having exactly the same gingival travel incidence (p>0.05).

Conclusions In treating unstable angina treatment, Fondaparinux produces an effect no inferior to the low molecular heparin calcium. Because of its long half-life, convenience in use and low injection site bleeding, petechiae, the incidence of pain than low
molecular weight heparin after daily injection, fondaparinux is an ideal choice in treating unstable angina.

**GW23-e1689** IN VIVO VIRTUAL HISTOLOGY INTRAVASCULAR ULTRASOUND COMPARISON OF NEOINTIMAL HYPERPLASIA WITHIN DRUG-ELUTING-VERSUS BARE METAL STENTS IN PATIENTS WITH STEMI

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**Objectives** The process of in-stent neointimal hyperplasia (NIH) between drug-eluting stents (DES) and bare metal stents (BMS) might be different. We compared in vivo composition of in-stent NIH between DES and BMS using virtual histology-intravascular ultrasound (VH-IVUS) in Patients with ST segment elevation myocardial infarction (STEMI).

**Methods** From May 2009 to Dec 2011, 63 patients were prospectively included in the protocol. Volumetric VH-IVUS was used to compare in-stent NIH between 45 DES and 33 BMS in 63 patients who underwent PCI because of STEMI. The inner and outer VH-IVUS contours were drawn in a way to avoid the stent strut artefacts. Cross-sectional analysis was done at every VH-IVUS frame within the stent, thereby allowing volumetric measurement of stent, lumen, and NIH and its components.

**Results** Baseline characteristics and IVUS measurements were similar between DES and BMS groups. The duration of follow-up was similar between DES (median 9 months (IQR, 3–15)) vs BMS (median 10 months (IQR, 4–15), (p=0.32).%necrotic core (NC) volume was significantly higher in DES than BMS:19.5 (16.3, 25.6) vs 12.1 (8.2, 18.5) (p=0.006), %NC volume significantly increased with time in BMS (p=0.007), but not in DES (p=0.24) so that at any given time point, %NC in DES was greater than in BMS. After adjustment for baseline differences, only DES (p=0.003) and stent age (p=0.048) were independent predictors of %NC volume. VH-IVUS in-stent thin-cap fibroatheromas were detected only in the DES group:34.8% vs 1.5%, (p=0.013).

**Conclusions** In vivo composition of in-stent NIH between DES and BMS was different, suggesting that the process of in-stent NIH in DES was greater than in BMS. After follow-up of 2 years in BMS (p=0.007), but not in DES (p=0.24) so that at any given time point, %NC in DES was greater than in BMS. After adjustment for baseline differences, only DES (p=0.003) and stent age (p=0.048) were independent predictors of %NC volume. VH-IVUS in-stent thin-cap fibroatheromas were detected only in the DES group:34.8% vs 1.5%, (p=0.013).

**GW23-e1856** CLINICAL SIGNIFICANCE OF PLASMA SCD40L AND GRADES OF ISCHAEMIA ON ADMISSION ELECTROCARDIOGRAM IN ACUTE MYOCARDIAL INFARCTION PATIENTS

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**Objectives** To investigate the Clinical significance of plasma sCD40L and grades of ischaemia on admission electrocardiogram in acute myocardial infarction patients.

**Methods** Through analysing 60 STEMI patients who underwent primary percutaneous coronary intervention (pPCI) and compared grade 1, 2 ischaemia (those with tall symmetric T waves and ST elevation) without terminal QRS distortion, n=44) to grade 3 ischaemia (ST elevation with terminal QRS distortion, n=16) on admission for baseline characteristics, in-hospital course, ST resolution (STR) and The plasma levels of sCD40L.

**Results** There were no differences between groups in the prevalence of previous hypertension, current smoking, previous diabetes mellitus, left ventricular ejection fraction (LVEF), time from onset of symptoms to therapy and the plasma levels of sCD40L (357.75±135.60 vs 354.06±122.31; p=0.924). The grade 3 ischaemic group had less complete STR immediately after pPCI (65.9% vs 31.3% [p=0.017] and 95.5% vs 68.8% (p=0.017) 24 h after pPCI), and a trend toward higher hospital mortality and higher MACE. However, the difference was not statistically significant.

**Conclusions** The plasma levels of sCD40L can’t be used to predict the severity of ischaemia grades on admission electrocardiogram in acute myocardial infarction patients. Compared to grade 1, 2 ischaemia, grade 3 ischemia on presentation of STEMI is associated with a higher hospital mortality rate and less complete STR after pPCI.

**GW23-e0802** THE STUDY OF CORRELATION BETWEEN PLASMA LEVELS OF HYPERHOMOCYSTEINEMIA AND ACUTE CORONARY SYNDROME

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**Objectives** To investigate HCY plasma concentration of acute coronary syndrome (acute coronary syndrome, ACS) after confirming diagnosis by clinic data and coronary angiography (coronary arteriography, CAG) and the relationship between plasma HCY level and coronary artery lesions.

**Methods** This study was conducted with 90 ACS patients and 60 healthy subjects randomly. The blood specimens were collected after on the second morning with a fasting status. Coronary angiography was carried out on each one of the selected objects, rule out other heart diseases such as diastolic cardiomyopathy, hypertrophic cardiomyopathy, rheumatoid cardiomyopathy, hyperthyroidism cardiomyopathy, abnormal of kidney and liver function and infection, malignant tumor, problems of the blood system, respiratory system disease and immune system disease. A total of 150 patients were selected divided into four groups, 30 cases of acute ST-segment elevation myocardial infarction group, 30 cases of the non-ST-segment elevation myocardial infarction group, 30 cases of unstable angina pectoris group and 60 healthy subjects with normal control group. All subjects were recorded general situation, the ages, blood fat and CAG results. All subjects were determined by high performance liquid chromatography (HPLC) method to detect HCY plasma concentration, with all the data SPSS17.0 package statistics processing.

**Results** (1) plasma HCY level of the acute ST-segment elevation myocardial infarction (STEMI) group is 17.83±2.56, plasma HCY level of the non-ST-segment elevation myocardial infarction (NSTEMI) group is 17.07±1.51, plasma HCY level of the control group is 10.15±2.00. There were not statistical significance among the three groups HCY level difference, plasma HCY level of the control group is 10.15±2.00. There are not statistical significance among the three groups HCY level difference and the control group (p<0.001). (2) Acute coronary syndrome groups and control group are categorised into 4 count groups according to coronary artery lesions count., plasma HCY level normal of the control group (60 cases) is 10.15±2.00; plasma HCY level of single vessel lesion group (26
cases) is 16.32±1.31; plasma HCY level of double vessel lesions group (50 cases) is 17.56±2.40 and, plasma HCY level of three lesions group (54 cases) is 17.84±1.30. F value 169.169, p<0.001. single lesion group, double vessel lesions group, three lesions group of plasma HCY level are obviously higher than those in the control group. (3) The correlation analysis between level of plasma HCY and coronary artery lesions count, r=0.804 (p<0.001), has the remarkable statistical significance. Plasma HCY level and coronary artery lesions count are positively related.

**Conclusions**

The level of plasma HCY and acute coronary syndrome is relevant and can reflect the coronary artery lesions. In acute coronary syndrome groups of patients, plasma HCY level is obviously higher than those in the control group. The more serious coronary artery lesions are, the higher plasma HCY concentration is. Therefore, in some extent, plasma HCY level could be regarded as an indicators used to guide disease assessment of clinical acute coronary syndrome.

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**GW23-e0141**

**THE RELATIONSHIP BETWEEN VENTRICULAR LATER POTENTIAL AND FRAGMENTED QRS COMPLEX IN ACUTE ST-ELEVATION MYOCARDIAL INFARCTION PATIENTS**

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**Objectives**

To investigate the relationship between ventricular later potential (VLP) and fragmented QRS complex (fQRS) in acute ST-elevation myocardial infarction patients.

**Methods**

Acute ST-elevation myocardial infarction patients who admitted to the First Affiliated Hospital of China Medical University from January 2011 to June 2011 were included in this prospective study, and all patients were given VLP examination and fQRS on a 12-Lead Electrocardiogram. There were 239 patients in all, who were divided into two groups according to whether fQRS were positive or not: fQRS positive group (172 patients) and fQRS negative group (67 patients). Data were analysed using a statistical software programme (SPSS V13.0; SPSS Inc, USA). Categorical data between two groups were compared by χ² test.

**Results**

In fQRS positive group (172 patients), 69.2% (119 patients) were VLP positive; in VLP negative group (67 patients), only 3.0% (2 patients) were VLP positive. The VLP positive rate was significantly higher in fQRS positive group than in fQRS negative group (X²=84.54, p<0.001).

**Conclusions**

In acute ST-elevation myocardial infarction patients, the VLP positive rate in fQRS positive group was significantly higher than that in fQRS negative group.

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**GW23-e0153**

**CLINICAL FEATURES OF VLP IN THE HIGH-ELDERLY ACUTE MYOCARDIAL INFARCTION PATIENTS**

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**Objectives**

To discuss the positive rate of ventricular late potential (VLP) in the High-elderly group (ages ≥ 60), the elder group (ages ≥ 60) and the non-elderly group AMI patients (ages < 60), respectively.

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**GW23-e1091**

**RELATIONSHIP OF ARACHIDONATE 5-LIPOXYGENASE ACTIVATING PROTEIN GENE SG13S114T/A POLYMORPHISM WITH ACUTE MYOCARDIAL INFARCTION**

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**Objectives**

To investigate the association between 5-lipoxygenase activating protein (ALOX5AP) gene SG13S114T/A polymorphism and acute myocardial infarction (AMI) in the Chinese Han population of Sunan region.

**Methods**

All of 300 patients with AMI and 415 control subjects free from coronary artery disease were recruited into the study. The ALOX5AP SG13S114T/A polymorphism ism was determined by PCR and restriction fragment length polymorphism analysis.

**Results**

(1) Compared with the control group, there was statistical difference of the frequencies of TT and AT genotype in the AMI group (p value was 0.027 and 0.032 respectively); the frequencies of T allele was not significantly different (59.50% vs 64.82%, p=0.324). (2) subgroup revealed: The frequencies of AA, AT, TT genotype and the T allele of the SG13S114T/A had no association with AMI in male group, but the frequency of TT genotype had significant correlation with AMI in female. Multivariate logistic regression analysis indicated that there was significantly correlation between ALOX5AP gene SG13S114T/A AT and TT with AMI (p value was 0.000 and 0.001 respectively). T allele had significantly association with AMI (p=0.038). There w as statistical difference of the frequencies of TT genotype in male and female (p value was 0.010 and 0.040 respectively in male group; p value was 0.010 and 0.004 respectively in female group), T allele was a significant risk factor for AMI in the female carrier (p=0.026), but had no association with AMI in male (p=0.285).

**Conclusions**

Conclusion: The ALOX5AP gene SG13S114T/A polymorphism may be associated with the susceptibility to AMI in the Chinese Han population of Sunan region. The T allele was a significant genetical risk factor for AMI and was the susceptibility to AMI in the female.
**Methods**

Sunan region.

**gene SG13S114T/A polymorphism in Chinese Han population of the arachidonate 5-lipoxygenase activating protein (ALOX5AP) Han population of Sunan region.**

**Results**

Without coronary heart disease (CHD). The serum LT4 level was found among any genotypes in this locus within the same gender (p>0.05). The serum LT4 level was positively correlated with the smoking, and unrelated with the gender, age, hypertension, diabetes and hyperlipidaemia in AMI patients.

**Conclusions**

In Chinese Han population of Sunan region, there are polymorphisms of ALOX5AP gene SG13S114 in patients with AMI and subjects without CHD. The serum LT4 level in AMI patients is higher than those in subjects without CHD, but unrelated with ALOX5AP gene SG13S114 polymorphism.

**Objectives**

To investigate the association of the serum leukotrienes (LT) B4 level with the ALOX5AP gene SG13S114T/A polymorphism in patients with acute myocardial infarction (AMI) in Chinese Han population of Sunan region.

**Methods**

The ALOX5AP gene SG13S114T/A polymorphism was genotyped by PCR and restriction fragment length polymorphism analysis, and the serum LT4 level (M/IQR) was measured by ELISA in 262 AMI patients (AMI group) and 132 subjects without coronary heart disease (CHD) (control group).

**Results**

Serum LT4 level in AMI group was significantly higher than the one in control group (477.97/370.52 pg/ml vs 200.57/236.65 pg/ml, p<0.001). In AMI patients, no significant difference in the serum LT4 level was found among any genotypes (AA, AT and TT) of ALOX5AP gene SG13S114T/A (517.98/392.00 pg/ml vs 492.31/427.55 pg/ml vs 495.29/398.54 pg/ml, all p>0.05), and there was also no significant difference in serum LT4 level among any genotypes in this locus within the same gender (p>0.05). The serum LT4 level was positively correlated with the smoking, and unrelated with the gender, age, hypertension, diabetes and hyperlipidaemia in AMI patients.

**Conclusions**

The serum LT4 level is significantly higher in UAP patients and has significant correlation with the risk of UAP, but unrelated with ALOX5AP gene SG13S114 polymorphism.

**Objectives**

To investigate the effects of monocyte chemoattractant protein-1 (MCP-1) -2518 G/A genetic polymorphism on its serum levels and unstable angina pectoris (UAP), and the association of MCP-1 serum level with UAP in Chinese Han population of Sunan region.

**Methods**

The -2518 G/A polymorphism of MCP-1 gene was genotyped in 263 patients with UAP and 192 control subjects by PCR-RFLP and DNA sequencing; Serum concentration of MCP-1 was randomly measured in 72 patients with UAP and 73 control subjects by ELISA.

**Results**

No significant difference was found in genotype distribution of the MCP-1-2518G/A between UAP and controls (all p>0.05), but G allele frequencies is significantly lower in UAP group than that in controls (p=0.044). Multivariate logistic regression analysis revealed that MCP-1-2518G/A polymorphism was not associated with an increased risk of UAP (p>0.05). No significance was found in the serum level of MCP-1([median/IQR]) pg/ml) between genotypes of the MCP-1-2518G/A within UAP group and controls, respectively; The serum level of MCP-1 was significantly higher in UAP group (175.89/283.09 pg/ml) than that in controls (100.71/134.02 pg/ml) (p=0.007). Multiple linear regression analysis revealed that the serum levels of MCP-1 was associated with hypertension, diabetes mellitus, smoking and female in UAP group. Multivariate logistic regression analysis further revealed an elevated serum level of MCP-1 (>75th percentile) was associated with an increased risk of UAP [p=0.039; OR 2.904 (1.058–7.970)].

**Conclusions**

The serum level of MCP-1 was significantly higher in UAP group than that in controls, and an elevated serum level of MCP-1 (>75th percentile) was associated with an increased risk of UAP in Chinese Han population of Sunan region; but the MCP-1-2518G/A polymorphism does not effect its serum levels nor contributes to an increased risk of UAP.

**Objectives**

To explore the association of the serum C-reactive protein (CRP) level with the CRP gene T-757C polymorphism and its serum levels with unstable angina pectoris (UAP), and the association of CRP gene T-757C polymorphism, its serum levels with unstable angina pectoris.

**Methods**

The ALOX5AP gene SG13S114T/A polymorphism was genotyped by PCR and restriction fragment length polymorphism analysis, and the serum LT4 level (M/IQR) was measured by ELISA in 262 AMI patients and 132 subjects without coronary heart disease (CHD) (control group).

**Results**

No significant differences in serum LT4 level also were showed among the three genotypes in this locus within the same age class by further subgroup [seniors group (>60 years old) and early onset group (<60 years old) analysis (all p values were greater than 0.05).

**Conclusions**

The serum LT4 level is significantly higher in UAP patients and has significant correlation with the risk of UAP, but unrelated with ALOX5AP gene SG13S114 polymorphism.
**GW23-e1096**

**THE RELEVANCE AMONG SERUM CRP LEVEL, CRP GENE C+1444T POLYMORPHISM AND THE RISK WITH ACUTE MYOCARDIAL INFARCTION**

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**Objectives** To investigate the relationship between serum CRP level, CRP gene C+1444T polymorphism and the risk with AMI from Sunan Chinese population.

**Methods** The serum CRP level was measured by enzyme linked immunosorbent assay (ELISA) and the CRP gene C+1444T polymorphism was genotyped by Polymerase reaction restriction-fragment length polymorphism (PCR-RFLP) between 227 patients with AMI (AMI group) and 161 control subjects.

**Results** 1. No differences were found in genotype distribution between AMI group and controls (CC 82.38%, CT 17.62%, TT 0 vs 86.96%, 13.04%, 0) (p>0.05).
2. The serum CRP level in AMI group was significantly higher than controls (p<0.01).
3. There were no differences in the serum levels between any genotypes of the CRP gene C+1444T (p>0.05).

**Conclusions** The elevated serum CRP level is an independent risk factor of AMI, but not influenced by CRP gene T-757C polymorphism in Chinese Han population of Sunan region.

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**GW23-e1079**

**ASSOCIATION OF THE SERUM LEVELS OF C-REACTIVE PROTEIN WITH ITS GENE POLYMORPHISMS AND ACUTE CORONARY SYNDROME**

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**Objectives** To investigate the association of the serum levels of CRP with its gene polymorphisms and the risk of ACS in Chinese Han population in Sunan region.

**Methods** The CRP gene T-757C polymorphism was genotyped by polymerase reaction restriction-fragment length polymorphism analysis, and the serum CRP level was measured by ELISA in 215 AMI patients (AMI group) and 173 subjects without coronary heart disease (CHD) (control group).

**Results** In Chinese Han population of Sunan region, there were CRP gene T-757C polymorphisms in patients with AMI and in subjects without CHD. The serum CRP level in AMI patients (5.985/6.527μg/ml) was significantly higher than those in subjects without CHD (3.262/1.556μg/ml) (p<0.01) and multivariate logistic regression analysis showed that the serum CRP level was a independent risk factor of AMI (OR (95% CI)=2.048 (1.234–3.401), p<0.01); In AMI patients, no significant differences were found in the serum CRP level among any genotype (CC, TC or TT) of the CRP gene T-757C (4.069/2.493μg/ml vs 5.745/6.321μg/ml vs 6.127/6.629 μg/ml), and there also were no significant differences in the serum CRP level among any genotypes in this locus within the same gender and age (p>0.05).

**Conclusions** The elevated serum CRP level is an independent risk factor of AMI, but not influenced by CRP gene T-757C polymorphism in Chinese Han population of Sunan region.
male ACS/UAP or elderly ACS/AMI/UAP carrying the CT genotype in C+1444T locus with the same gender and age stage (all p values less than 0.05).

3. Association of the serum CRP levels with the CRP gene polymorphisms

3.1 The serum CRP levels with the CRP gene T-757C polymorphism

3.1.1 ACS/AMI/UAP/control group There was no significant difference of the serum CRP levels between TT and (CC+TC) genotype in ACS/AMI/UAP/control group (7.244/9.076 µg/mL vs 8.601/8.009 µg/mL; 7.446/8.185 µg/mL vs 8.369/7.157 µg/mL; 6.980/9.617 µg/mL vs 8.369/9.183 µg/mL and 3.567/2.979 µg/mL vs 3.642/2.209 µg/mL, respectively) (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene T-757C polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis (all p value greater than 0.05).

3.2.2 ACS/AMI/UAP/control group with the same gender and age stage There was no significant difference of the serum CRP levels between TT and (CC+TC) genotype in ACS/AMI/UAP/control group with the same gender and age stage (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene T-757C polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis with the same gender and age stage (all p value greater than 0.05).

3. The serum CRP levels with the CRP gene C+1444T polymorphism

3.1.1 ACS/AMI/UAP/control group There was no significant difference of the serum CRP levels between CC and CT genotype in ACS/AMI/UAP/control group (8.148/8.287 µg/mL vs 8.550/6.797 µg/mL; 8.220/7.262 µg/mL vs 8.095/8.433 µg/mL; 8.075/9.432 µg/mL vs 8.550/7.241 µg/mL and 3.590/2.490 µg/mL vs 3.559/2.127 µg/mL, respectively) (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene C+1444T polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis (all p value greater than 0.05).

3.2.2 ACS/AMI/UAP/control group with the same gender and age stage There was no significant difference of the serum CRP levels between CC and CT genotype in ACS/AMI/UAP/control group with the same gender and age stage (all p value greater than 0.05); Logistic regression analysis showed that there was no association of the serum CRP levels with the CRP gene C+1444T polymorphism in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis with the same gender and age stage (all p value greater than 0.05).

Conclusions In Chinese Han population in Sunan region, elevated serum CRP levels is relevant to risk of ACS/AMI/UAP. There are no associations of the serum CRP levels with the CRP gene T-757C and C+1444T polymorphisms in ACS/AMI/UAP patients and non-CAD subjects without coronary stenosis of any gender and age stage.

Objectives To further up investigate the distribution of CRP gene T-757C polymorphism in the promoter region and the correlation analysis again of the CRP gene T-757C polymorphism with the risk of ACS in the Chinese Han population of Suwan region.

Methods This study was conducted with a case-control design including 920 patients with ACS (ACS group) and 524 control subjects without coronary artery disease (CAD) (control group). The T-757C polymorphism in CRP gene was determined by PCR and restriction fragment length polymorphism analysis.

Results As compared with those in control group, there was no statistical differences of the frequencies of TT, TC or CC genotype, and T allele between ACS group and controls. Multivariate logistic regression analysis adjusting for traditional CAD risk factors such as age, gender, smoking, hypertension, diabetes, triglycerides, low density lipoprotein cholesterol and high density lipoprotein cholesterol indicated that there was no significant correlation between the CRP gene T-757C polymorphism and the risk of ACS (p>0.05).

Conclusions Conclusion: There is no significant correlation of the CRP gene T-757C polymorphism with risk of ACS in the Chinese Han population of Suwan region.

GW23-e1083 CORRELATION ANALYSIS AGIAN OF C-REACTIVE PROTEIN GENE T-757C POLYMORPHISM WITH RISK OF ACUTE CORONARY SYNDROME

doi:10.1136/heartjnl-2012-302920k.22

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Objectives To investigate the possible association between arachidonate 5-lipoxygenase activating protein (ALOX5AP) gene SG13S114T/A polymorphism with acute coronary syndrome in male.

GW23-e1085 CORRELATION OF ARACHIDONATE 5-LIPOXGENASE ACTIVATING PROTEIN GENE SG13S114T/A POLYMORPHISM WITH ACUTE CORONARY SYNDROME IN MALE

doi:10.1136/heartjnl-2012-302920k.24

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Objectives To investigate the changes of the serum leukotriene (B4) level and its correlation with susceptibility in acute coronary syndrome (ACS).

Methods The serum LTb4 level was measured by ELISA in 403 patients with ACS (ACS group) and 132 subjects with chest pain who were free from coronary heart disease by coronaryography (control group).

Results The serum LTb4 level (M/IQR) was significantly higher in patients with ACS (477.97/370.52 pg/ml) in patients with acute myocardial infarction (AMI) and (352.52/255.48 pg/ml) unstable angina pectoris (UAP) patients, respectively) than the those in controls (200.57/236.65 pg/ml) (p<0.001), and was higher in patients with AMI than the those in patients with UAP (p<0.001). The serum LTb4 level was significantly positively correlated with smoking (p<0.05), unrelated with the male, the elderly, hypertension, diabetes and hyperlipidaemia (p>0.05) in ACS patients.

Conclusions The elevated serum LTb4 level may be associated with the susceptibility to AMI in the Chinese Han population of Sunan region and positively correlated with the smoking in patients with ACS.
A polymorphism and acute coronary syndrome (ACS) in male.

Methods A case-control study was conducted in 374 ACS patients documented by coronary angiography and 288 control subjects without coronary artery disease. The ALOX5AP gene SG13S114T/A polymorphism was determined by PCR and restriction fragment length polymorphism analysis.

Results Compared with those in control group, there was no statistical difference of frequencies of AA, AT and TT genotype (p>0.05) and the T allele frequency was obviously higher (68.06% vs 82.42%, p<0.05) in ACS group. Multivariate logistic regression analysis showed that AT and TT genotype, and the T allele were related with the risk of ACS in male (p<0.001, p=0.001 and p=0.016, respectively).

Conclusions The AT and TT genotype and the T allele of ALOX5AP gene SG13S114T/A may be associated with the susceptibility to ACS in male.

INTERRELATION AMONG THE SERUM LEUKOTRIENE B4 LEVEL, ARACHIDONATE 5-LIP OXYGENASE ACTIVATING PROTEIN GENE SG13S89G/A POLYMORPHISM AND RISK OF ACUTE MYOCARDIAL INFARCTION

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Objectives To investigate the interrelation among the serum leukotriene (LT) B4 level, the arachidonate 5-lipoxygenase activating protein (ALOX5AP) gene SG13S89G/A polymorphism and the risk of acute myocardial infarction (AMI) in the Chinese Han population of Changzhou region.

Methods The polymorphism in the ALOX5AP gene SG13S89G/A was genotyped by PCR and restriction fragment length polymorphism analysis and the serum LT B4 level (M/IQR) was measured by ELISA in 262 patients with AMI (AMI group) and 132 subjects with chest pain who were free from coronary heart disease by coronary angiography (control group).

Results As compared with those in control group, there were no significant differences in (AA+GA) and GG genotype (7.58% vs 4.96% and 92.42% vs 95.04%, respectively), and A allele frequencies (4.17% vs 2.67%) of ALOX5AP gene SG13S89G/A locus in AMI group (all the p value >0.05). Multivariable logistic regression analysis showed that there was no significant association between ALOX5AP gene SG13S89G/A polymorphism and the risk of AMI. The serum LT B4 level in AMI group was significantly higher than the one in control group (477.97/370.52 pg/ml vs 200.57/236.65 pg/ml, p<0.001). Multivariable logistic regression analysis show that the serum LT B4 level was significantly correlated with the risk of AMI. No significant difference in serum LT B4 levels was found between (AA+GA) and GG genotype in AMI group or control group (all the p value>0.05).

Conclusions The serum LT B4 level is significantly correlated with the risk of severe haemorrhage in patients with ACS. The ALOX5AP gene SG13S114G/A polymorphism may not be correlated to the risk of AMI and not influence the serum LT B4 level in Chinese Han population of Changzhou region.

THE ROLES OF COMMON CAROTID ARTERY INTIMA-MEDIA THICKNESS AND COMPLEX CORONARY LESIONS IN RISK STRATIFICATION OF NON-ST-ELEVATION ACUTE CORONARY SYNDROMES

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Objectives To explore the relationship of common carotid intima-media thickness (CIMT) and the coronary lesions’ morphology with the Thrombolysis in Myocardial Infarction (TIMI) risk score for non-ST-elevation acute coronary syndrome (NSTEMI). And evaluate the roles of CIMT in risk stratification of NSTEMI.

Methods One hundred and thirty-two patients with NSTEMI were recruited. CIMT were measured, and the coronary angiographies were analysed to detect the single or multiple complex coronary stenotic lesions. Their correlation with TIMI risk score and its variables were investigated.

Results Satisfying images of CIMT were obtained in one hundred and twenty-three patients (99.2%), and the general CIMT was 0.83 ±0.22 mm. Sixty-two patients (50.4%) had an abnormal ≥0.8 mm) CIMT, whilst 52 patients (39.4%) only had single complex coronary lesions and 80 (60.6%) had multiple complex coronary lesions. CIMT was correlated with TIMI risk score
and chronic renal failure were the major risk factors for long-term coronary artery lesion severity. Gender

Conclusions CIMT and the presence of multiple complex lesions in patients with NSTEACS are correlated with TIMI risk score. Both variables were related to age and diabetes. CIMT can act a role in the risk stratification of NSTEACS.

GW23-e1471 CORRELATION BETWEEN CORONARY ARTERY LESION SEVERITY AND LONG-TERM CLINICAL OUTCOMES IN CHINESE HAN OCTOGENARIANS WITH ACUTE CORONARY SYNDROME

doi:10.1136/heartjnl-2012-302920k.28
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Objectives There is little long-term outcome data regarding acute coronary syndrome (ACS) in Chinese Han octogenarians (>80 years old). Accordingly, we assessed the correlation between coronary artery lesion severity and long-term mortality in octogenarians with ACS.

Methods We classified 536 consecutive octogenarians with ACS based on the Gensini score into 4 groups: a control group (group 1), a group with Gensini score <20 (group 2), a group with Gensini score from 21 to 60 (group 3), and a group with Gensini score >61 (group 4). Survival and MACE rates were calculated using the Kaplan-Meier method. Multivariate Cox regression was used to identify mortality predictors.

Results There were 66 (12.3%), 141 (26.3%), 167 (31.2%) and 162 (30.2%) patients in groups 1, 2, 3 and 4, respectively. The average Gensini score was 30.2% patients in groups 1, 2, 3 and 4, respectively. The average follow-up was 27.1±16.0 months. Heart rate, systolic blood pressure (SBP), blood glucose level, e-GFR, morbidity from old myocardial infarction, smoking, ACS type, and GRACE score were the determinants of coronary artery lesion severity. Increasing coronary artery lesion severity was associated with increased long-term mortality and MACE rates. The overall long-term mortality rate was 9.1% and increased from 3.0% in group 1 to 16.7% in group 4. Age, gender, heart rate, SBP, chronic renal failure, e-GFR, GRACE score, Gensini score, and ACS type were the independent predictors of long-term mortality.

Conclusions Long-term mortality of octogenarians with ACS was associated with increased coronary artery lesion severity. Gender and chronic renal failure were the major risk factors for long-term mortality.

GW23-e2499 ACETYLCHOLINE INJECTION CAUSES CORONARY ARTERY SPASM AND CORONARY ARTERY MICROcirculation DYSFUNCTION—A CLINICAL RESEARCH

doi:10.1136/heartjnl-2012-302920k.29
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Objectives Observing the patients with angina during the procedure acetylcholine causes coronary artery spasm, whether coronary artery microcirculation dysfunction is existed and surveying the influencing factor.

Methods We studied the patients with doubtful angina whose coronary arteriography showed the major and branches of coronary artery with less than 50% stenosis. Acetylcholine causes coronary artery spasm was carried out with these patients. These patients who had Angina were in the hospital of cardiovascular Department of Kyushu Medical University in Japan during Jan 2001 to Oct 2003.

Results We studied 574 patients. These patients were divided into three groups according to the changing of lumen diameter of the coronary artery after acetylcholine was injected. 574 patients were accepted acetylcholine by coronary artery injection, 337 patients appeared Coronary artery spasm, the incidence was 58.7%; the age of coronary artery spasm group was higher than the matched group with p<0.05. It was Prompted that the incidence of Coronary artery spasm was increased Followed up age increasing, whether it was Related to Coronary atherosclerosis that was Atherosclerosis Coronary artery was Coronary artery spasm was More likely to occur, it was no reported.129 patients appeared coronary artery microcirculation dysfunction, the incidence was 22.8%, and the Proportion of Female in this group was higher than the matched group, it was 69.8%. Difference was Significantly than matched group with p<0.001; We had noticed that in the coronary artery microcirculation dysfunction group, the Proportion of smoker was lower than the matched group, Subgroup analysis about all the Subjects, Smoking rates in Male was 72.2%, and 13.6% in female, with p<0.001; the male and female were analysis Respectively in the two group, the Smoking rates was no difference, it was showed that the difference of smoking was caused by the difference of gender. Coronary artery spasm, Coronary artery microcirculation dysfunction were no relationship with Hypertension and Diabetes. In the whole test; Cardiac arrhythmias was occurred with some subjects such as Sinus bradycardia, Atial contractions, Ventricular contractions, Atioventricular block, Facing rhythm Etc., The incidence was 28.2%, but it was no significant difference between three groups. Among the subjects with Cardiac arrhythmias, one was Right coronary artery spasm, following the spasm, the Ventricular fibrillation was occurred immediately, and it was turned to Sinus rhythm by way of defibrillation.

Conclusions In the test of acetylcholine causes coronary artery spasm, the age of coronary artery spasm group was higher than matched group, prompted that the incidence of coronary artery spasm was increasing with aging; Coronary artery microcirculation dysfunction was really existed. The evidence was the increasing of lactate concentration in the coronary sinus vein, this phenomenon was common in women. In this test, whether coronary artery spasm or coronary artery microcirculation dysfunction, it was no relationship with smoking, hypertension and type 2 diabetes.

GW23-e0133 CLINICAL FEATURE ANALYSIS OF VENTRICULAR LATE POTENTIAL BETWEEN ACUTE STEMI AND NSTEMI PATIENTS

doi:10.1136/heartjnl-2012-302920k.30
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Objectives To discuss the positive rate of ventricular late potential (VLP) between acute ST-segment elevation myocardial infarction (STEMI) and acute non ST-segment elevation myocardial infarction (NSTEMI) patients.
The VLP positive rate of STEMI group is higher than that of NSTEMI group. The occurrence rate of malignant ventricular arrhythmia in VLP positive patients was 14.1%, while in VLP negative patients was 7.0% (X²=4.996, p<0.05). VLP positive was a risk factor of malignant ventricular arrhythmia in acute myocardial infarction patients. VLP is one of the important indicators to predict the malignant ventricular arrhythmia attack in acute myocardial infarction patients.

**Methods** 576 cases of acute myocardial infarction patients (304 cases of STEMI patients and 72 cases of NSTEMI patients), which were admitted to the first affiliated hospital of China Medical University between January 2011 and July 2011, were undergone VLP examination.

**Results** The VLP positive rate of STEMI group was 53.6%, while that of NSTEMI group was 38.9%, and the differences have statistics meaning (X²=5.053, p<0.05). The occurrence rate of malignant ventricular arrhythmia in VLP positive patients was 14.1%, while in VLP negative patients was 7.0% (X²=4.996, p<0.05). VLP positive was a risk factor of malignant ventricular arrhythmia (OR=2.178, 95% CI 1.087 to 4.366).

**Conclusions** The VLP positive rate of STEMI group is higher than that of NSTEMI group. The occurrence rate of malignant ventricular arrhythmia in VLP positive patients is higher than that in VLP negative patients. VLP is one of the important indicators to predict the malignant ventricular arrhythmia attack in acute myocardial infarction patients.
Results (1) The plasma TFPI-1 antigen levels were higher in the AMI and UAP groups than in the SAP and control groups (52.05 ±8.52 and 31.49 ±10.61 ng/ml vs 19.93 ±9.22 and 19.21 ±9.60 ng/ml, p<0.05), there was no significant difference between the AMI group and UAP group, SAP group and control group. (2) The plasma TFPI-2 antigen levels were higher in the AMI and UAP groups than in the SAP and control groups (4.56 ±0.96 and 4.73 ±1.04 ng/ml vs 2.43 ±1.07 and 2.06 ±0.64 ng/ml, p<0.05), there was no significant difference between the AMI group and UAP group, SAP group and control group. (3) The plasma TFPI-1 was higher in those patients who had 3 sick coronaries and 2 coronaries than those who had 1 sick coronary (p<0.05), there was no difference of TFPI-2 among the three groups (p>0.05). (4) There was a positive relationship between the level of plasma TFPI-1 and the level of serum TC, LDL-C (r=0.633 and r=0.386, p<0.01), between the level of plasma TFPI-2 and the quantities of serum TC, LDL-C (r=0.248 and r=0.235, p<0.01), there were no significant relationships between TFPI-1, TFPI-2 and the level of TC, HDL-C (p>0.05). (5) Spearman analysis showed there was no positive relationship between the plasma TFPI-1 and TFPI-2 and the number of involved branches of coronary arteries (p>0.05).

Conclusions The plasma TFPI antigen levels of ACS patients are higher than those of SAP patients and healthy adults, There were positive relationships between plasma TFPI-1, TFPI-2 quantities and serum TC, LDL-C quantities.

GW23-e0972 THE CLINICAL VALUE OF MYOCARDIAL ENZYMES AND TROPONIN I COMBINED DETECTION FOR EARLY DIAGNOSIS OF ACUTE MYOCARDIAL INFARCTION doi:10.1136/heartjnl-2012-302920k.34
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Objectives To investigate the clinical value of myocardial enzymes and troponin I combined detection for early diagnosis of acute myocardial infarction.

Methods 169 patients with acute chest pain were detected of myocardial enzymes (AST and LDH, CK, CK-MB) and troponin I, which were used to calculate the specificity and sensitivity.

Results Out of 48 cases of acute myocardial infarction patients, 41 cases of myocardial enzymes increased, the sensitivity was 85.4%, but 43 cases of cardiac troponin I were positive, the sensitivity was 89.6%. Out of 21 cases of ST-segment elevation acute myocardial infarction (STEMI) patients, 20 cases of myocardial enzyme increased and 21 cases of cardiac troponin I were positive. Out of 27 cases of non-ST-segment elevation acute myocardial infarction (NSTEMI) patients, 25 cases of myocardial enzyme increased and 25 cases of cardiac troponin I were positive. Out of 120 cases of non-acute myocardial infarction patients, 10 cases of myocardial enzymes increased, the specificity was 91.7%, but 5 cases of cardiac troponin I were positive, the specificity was 95.8%.

Conclusions Combined detection of myocardial enzymes and troponin I in acute myocardial infarction has high specificity and sensitivity and has important clinical value of early diagnosis of acute myocardial infarction.

GW23-e1620 ACTIVATION AND EXPRESSION OF NF-κB IN CIRCULATING MONONUCLEAR CELLS IN APPARENTLY HEALTHY PEOPLE doi:10.1136/heartjnl-2012-302920k.35

Objectives JUPITER trial demonstrated that administering Rosuvastatin to ‘apparently healthy people’ (with normal lipid levels, but hsCRP >2 mg/L) could decrease the incidences of cardiovascular diseases significantly. Whereas, little is known about the inflammatory state of ‘apparently healthy people.’ NF-κB is a major inflammatory pathway enlarging the effects of CRP and could be suppressed by statins. The aim of this study was to figure out whether NF-κB is in active status in the circulating mononuclear cells in ‘apparently healthy people’.

Methods We collected fasting venous blood samples from ‘apparently healthy people’ (n=14) and control group (n=14). The recruit and exclusion criteria referred Jupiter trial in the context of Chinese Han people. We recruit men age 55 years and older and women age 65 years and older, who have hsCRP <2 mg/L, LDL-C <3.4 mmol/l, and who have no history of myocardial infarction, stroke, arterial revascularisation, or coronary risk equivalent as defined by current NCEP guidelines. Control group have hsCRP <2 mg/L, and other criteria were the same with apparently healthy group. Additional exclusion criteria were as follows: current use of statins or other lipid-lowering therapies; current use of postmenopausal oral hormone therapy; current use of immunosuppressants; uncontrolled hypertension; history of cancer; chronic inflammatory conditions; history of alcohol or drug abuse within the past year. MNC was isolated by Ficoll standard density gradient centrifugation, and nuclear and cytoplasmic protein were extracted separately. NF-κB DNA binding activity was measured by electrophoretic mobility shift assay (EMSA). Detect and compare the expression of p65, p50, 1KB-α and 1KB-β by western blotting. Densitometry was performed with the use of Odyssey infrared imaging system, and all values were corrected for loading with GAPDH. Levels of IL-6 and TNF-α in serum were assayed by ELISA.

Results The baseline characteristics of the apparently healthy people and control group were equivalent. The average hs-CRP in apparently healthy group and the control group were 4.89 mg/l (3.54–10.03 mg/l) and 0.53 mg/l (0.31–0.98 mg/l) respectively. The NF-κB binding activity in nuclear extracts increased markedly compared to that of control group (fluorescent intensity 6.19±1.76 vs 3.02±1.18, p<0.001), and the NF-κB activation had a positive correlation with levels of hsCRP (r=0.683, p<0.001). The expression of p50 in ‘apparently healthy people’ was significantly higher (p<0.001) and the level of 1KB-β was lower (p<0.001) than that of control group in protein level, whereas the expression of p65 was a little higher in ‘apparently healthy people’ group (p=0.05) and the level of 1KB-α showed no significant difference between the two groups. The TNFα expression in serum of ‘apparently healthy people’ group is significantly higher than that of control group (22.32±0.89 pg/ml vs 17.91±1.35 pg/ml, p<0.05), but the expression of IL-6 between the two groups showed no significant differences (17.91±1.35 pg/ml vs 17.91±1.35 pg/ml, p=0.46).

Conclusions These data showed for the first time that NF-κB binding activity and expression of P50 were higher in ‘apparently healthy people’ than that of healthy control, and the activity of NF-κB is positively correlated with the levels of hsCRP in serum, all of which might call on attentions on the ‘apparently healthy status’, and build the base for revealing the mechanisms underlying the Jupiter Trial in further research.
**GW23-e2033** DICKKOPF-1 (DKK1) AS A NOVEL BIOMARKER IS ASSOCIATED WITH RISK STRATIFICATION BY GRACE RISK SCORE FOR PREDICTIVE VALUE IN PATIENTS WITH ACUTE CORONARY SYNDROME

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**Objectives** DKK-1, a major regulator of the wingless (Wnt) pathway, turns out to play role in cardiovascular disease. The knowledge of relationship between DKK-1 and ACS is limited, and we also want to find whether the predictive value of post-discharge GRACE risk score can be improved by adding DKK-1.

**Methods** 291 patients admitted in our cardiovascular department from March 2008 to January 2010 were enrolled (46 with STEMI and 245 with NSTE-ACS) in the study. All the clinical data were collected by a specific physician. The plasma DKK-1 concentrations were measured using ELISA (R&D) strictly according to the manufacturer’s protocol. We calculated the post-discharge GRACE score and assessed the prognostic value alone and together with DKK-1 or hs-CRP.

**Results** After a median follow-up of 2 years, 40 patients had major adverse cardiac event. DKK-1 was significantly higher in STEMI patients compared with NSTE-ACS patients in baseline (p=0.006). The concentration of DKK-1 was higher in the high risk category of GRACE score than the intermediate and low groups (p=0.006 and p<0.001). There was no significant difference between the intermediate and low groups (p=0.099). The event group also had higher DKK-1 concentration compared with non-event group (p<0.001). DKK-1 concentration was correlated with hs-CRP (r=0.295, p<0.01). The GRACE score provided a c-statistic regarding MACE of 0.525. The c-statistic was improved to 0.782 after addition of hs-CRP, 0.768 for DKK-1 and 0.834 when both two biomarkers were added.

**Conclusions** DKK-1 is an independent predictor for long-term MACE of ACS patients. The long-term predictive ability of post-discharge GRACE score is enhanced by the addition of DKK-1.

**GW23-e1347** CLINICAL ANALYSIS ON ACUTE MYOCARDIAL INFARCTION WITH NORMAL CORONARY ARTERY IN CORONARY ANGIOGRAPHY

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**Objectives** To observe presentation of acute myocardial infarction (AMI) with normal coronary artery in Coronary Angiography (CAG).

**Methods** 76 patients with AMI underwent coronary angiography in 2 weeks. According to coronary angiogram the patients were divided into group A (those with normal coronary artery, 16 cases) and group B (those with abnormal coronary artery, 60 cases). Their risk factors were analysed retrospectively: Risk factors; clinical data; left ventricular ejection fraction; ventricular wall motion abnormalities ratio; total cardiac events and acute stage prognosis were compared between Group A and Group B.

**Results** Mean age of A group and B group (48.06±13.8 years’old vs 57.60±8.73 years’old) have significant differences. No significant difference has found in sex ratio (0.0% : 31.7%). The proportion of hypertenion (25% : 50%); diabetes (0.0% : 31.7%); hyperlipemia (6.25% : 16.7%); smoking as single risk factor (50.0% : 20.0%) in two groups have significant differences. Previous angina were more frequent in Group B than group A (18.8% : 31.7%). More Inferior wall myocardial infarction (62.5%) in group A and more anterior wall myocardial infarction (51.7%) are found in group B.P send aneurysm (0.0% vs 5.0%); malignant arrhythmia (6.3% vs 10.0%) and Killip >2 in group A were lower than group B. Left ventricular ejection fraction in group A (61.6±13.64%) is higher than group B (56.5±14.54%), the difference is significant.

**Conclusions** Patients of AMI with normal coronary artery are relative younger and have more males; more smokers; less previous angina; more inferior wall myocardial infarction; better cardiac function and clinical outcomes during hospitalisation.

**GW23-e1537** A NOVEL POLYMORPHISM OF THE CYP4F2 GENE IS ASSOCIATED WITH ACUTE CORONARY SYNDROME

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**Objectives** CYP4F2 is responsible for metabolising arachidonic acid to 20-hydroxyeicosatetraenoic acid (20-HETE), which plays a crucial role in the regulation of cardiovascular homeostasis. The present study aimed to evaluate whether or not the CYP4F2 gene polymorphism is involved in acute coronary syndrome (ACS).

**Methods** Four CYP4F2 SNPs were genotyped (rs1588159, rs5093166, rs5093194, rs2108622) using the Real-Time PCR System. We examined the role of these SNPs for ACS using two independent case–control studies: one was in the Han population (326 ACS patients and 338 control subjects) and the other was in the Uygur population (265 ACS patients and 276 control subjects).

**Results** CC+CT carriers of SNP4 (rs2108622) genotype were more frequent among ACS patients than among controls not only in the Han population of men (97% vs 91%) but also in the Uygur population of men (95% vs 88%). After adjustment of confounding factors such as smoking, alcohol consumption, hypertension, diabetes, body mass index, the OR for carriers of the rs2108622 genotype for ACS was 4.180 (95% CI 1.304 to 13.400) in the Han population of men and 2.878 (95% CI 1.059 to 7.825) in the Uygur population of men.

**Conclusions** The rs2108622 genotype of CYP4F2 may be a genetic maker of ACS in the Han and Uygur population of men in western China.

**GW23-e0671** THE INFLUENCE OF ABNORMAL GLYCOMETABOLISM ON ADIPONECTIN LEVEL AFTER STEMI TREATED WITH PPCI AND PROGNOSTIC VALUE OF ADIPONECTIN

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**Objectives** To characterise the glycometabolic state of patients with acute myocardial infarction (AMI), and to investigate the influence of abnormal glycometabolism on adiponectin levels after the first acute myocardial infarction treated with PPCI and prognostic value of adiponectin.

**Methods** Two hundreds and six consecutive patients with STEMI at Beijing Friendship hospital were enrolled from July 2010 to August 2011. Patients with non-diagnosed diabetes were performed oral glucose tolerance test (OGTT). Patients with AMI were divided into three groups on the glycometabolic state: NGT (normal glucose
tolerance), IGR (impaired glucose regulation) and DM (Diabetes Mellitus). Blood samples were drawn before the invasive procedure, immediately after the invasive procedure, and at 24 h, 48 h, 72 h and 7 days after AMI onset. Left ventricular end-diastolic diameter (LVEDD) and left ventricular ejection fraction (LVEF) were measured in all patients. All of the subjects accomplished the coronary angiography (CAG); assessed the severity of coronary artery lesions, TIMI grade and CTF (corrected TIMI frame count).

**Results**

1. 28.2% patients had known type 2 diabetes mellitus before AMI. Of patients with no diabetes, 46.6% patients had impaired glucose regulation (IGR), 10.8% patients had newly diagnosed diabetes. Of all patients with AMI, 79.4% patients had abnormal glycometabolism.

2. Compared with NGT and IGT group, the fasting blood glucose and blood glucose immediately at admission of DM group were higher (p<0.05). LVEF of DM group was lower than the others (p<0.05).

3. Plasma adiponectin levels after the invasive procedure in NGT, IGR and DM was the lowest one.

4. Plasma adiponectin levels after the invasive procedure in NGT, IGR and DM were lower than before the invasive procedure. Plasma adiponectin at 24 h after AMI onset in NGT, IGR and DM was the lowest one.

5. Increased plasma adiponectin predicts MACE in patients with STEMI treated with PPCI at discharge and 6-month follow up.

**Conclusions**

1. Abnormal glycometabolism is common in patients with AMI.

2. Compared with NGT and IGT, LVEF of DM at admission was worse.

3. Compared with NGT and IGR, adiponectin of DM was lower.

4. Plasma adiponectin levels after the invasive procedure in NGT, IGR and DM were lower than before the invasive procedure. Plasma adiponectin at 24 h after AMI onset in NGT, IGR and DM was the lowest one.

5. Increased plasma adiponectin predicts MACE in patients with STEMI treated with PPCI at discharge and 6-month follow up.

**GW23-e1081 ASSOCIATIONS OF THE SERUM LEUKOTRIENE B4 LEVEL WITH ARACHIDONATE 5-LIPOXYGENASE ACTIVATING PROTEIN GENE POLYMORPHISMS AND THE RISK OF ACUTE CORONARY SYNDROME**

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**Objectives**

To explore the associations of the arachidonate 5-lipoxygenase activating protein (ALOX5AP) gene SG13S114T/A or SG13S89G/A polymorphisms with the serum leukotriene (LT) B4 levels in acute coronary syndrome (ACS) patients and subjects without coronary artery disease (CAD) from Chinese Han population of Sunan region for providing laboratory data in the further research of effects of LT4 on the ACS pathogenesis.

**Methods**

In the same individuals, the ALOX5AP gene SG13S114T/A or SG13S89G/A polymorphisms was genotyped by polymerase reaction-restriction fragment length polymorphism analysis and the serum LT4B level (M/IQR) was measured by ELISA in 506 cases of ACS patients (ACS group) and 201 subjects without coronary stenosis (control group).

**Results**

1. The serum LT4B levels in ACS group significantly were higher than those in the control group (470.27/316.32 vs 233.05/226.82 μg/ml, p<0.001); after adjusting for traditional CAD risk factors such as gender age, smoking, hypertension, diabetes and dyslipidemia by the Logistic regression analysis, there was a significant correlation of the serum LT4B levels with the risk of ACS (OR=6.454, 95% CI 4.203 to 9.911, p<0.001).

2. In the ACS group and control group, there were no significant difference of the serum LT4B levels among any genotypes (AA, AT and TT) of the ALOX5AP gene SG13S114T/A or between GG and (GA+AA) genotypes of the ALOX5AP gene SG13S89G/A (all p>0.05).

**Conclusions**

Conclusion: In Chinese Han crowd of Sunan region, elevated serum LT4B levels is relevant to risk of ACS, but there are no associations of the ALOX5AP gene polymorphisms. There is a significant difference of the serum LT4B levels in ACS patients and subjects without coronary stenosis.

**GW23-e1594 CORRELATION BETWEEN ENDOTHELIAL DYSFUNCTION EVALUATED BY PERIPHERAL ARTERIAL TONOMETRY AND PROGNOSIS OF ACUTE MYOCARDIAL INFARCTION**

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**Objectives**

To explore whether the use of Peripheral Arterial Tonometry (PAT) in the evaluation of admission vascular endothelial function of acute myocardial infarction (AMI) patients can predict recurrence of major adverse cardiovascular events (MACE). Patients with high adiponectin had increased MACE at discharge and 6-month follow up compared to patients with low adiponectin (p<0.05).

**Methods**

116 consecutive patients clinically diagnosed with AMI were divided into the normal endothelial function group (RHI >=1.67) and the endothelial dysfunction group (RHI<1.67), follow-up of MACE was conducted in both groups during hospitalisation (median value 8.0 days) and after discharge from hospital (243.8 ± 68.3 days). MACE included cardiac death, recurrent acute myocardial infarction, recurrent unstable angina during hospitalisation, ischaemic stroke, elective PCI or CAGB, and hospitalisation due to cardiovascular causes.

**Results**

There was no significant difference in recurrence of MACE between PAT-determined endothelial dysfunction group (RHI<1.67) and normal endothelial function group (RHI >=1.67) both during hospitalisation and after discharge from hospital (p=0.098 and 0.104, respectively), yet Kaplan-Meier survival curves showed that during hospitalisation the cumulative event-free incidence of endothelial dysfunction group tended to be lower than that of normal endothelial function group, although the difference was not statistically significant (p=0.367).

**Conclusions**

PAT cannot predict recurrence of major adverse cardiovascular events in AMI patients both during hospitalisation and after discharge from hospital.
**GW23-e0094**

**CLINICAL PROGNOSIS OF DIFFERENT CORRESPONDING ST SEGMENT DEPRESSION TYPE IN ECG IN PATIENTS WITH ACUTE ST SEGMENT ELEVATION MYOCARDIAL INFARCTION**

doi:10.1136/heartjnl-2012-302920k.42

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**Objectives** To explore the relationship of culprit artery and clinical prognosis of different corresponding ST segment depression type in patients with acute ST segment elevation myocardial infarction.

**Methods** 967 cases of STEMI patients with completed data were enrolled in present study. The patients were divided into four groups according to the amplitude of R-ST-D, and group 1 consisted of 145 patients with non R-ST-D, group 2 consisted of 664 patients which the amplitude of R-ST-D, were less or equal to the amplitude of the ST segment elevation in myocardial infarction area, group 3 consisted of 93 patients whose the amplitude of R-ST-D were larger than the amplitude of the ST segment elevation, group 4 consisted of 67 patients whose corresponding ST segment and ST segment in myocardial infarction area were all elected. Analyse the relationship of the culprit artery and clinical prognosis between the four groups.

**Results** group 2 occured in 68.7% patients in the four groups. Group 1 were not so many as group 2 and were mainly in anterior descending branch. Group 4 were mainly in complex anterior wall with anterior descending branch and circumflex branch and right coronary artery, and involved in many artery branch. group 3 and group 4 occured in 9.6%, 6.9% were significantly higher than group 1 and group 2 (p<0.05 or p<0.01). Clinical occurrence of complication such as pump failure, low blood pressure, malignant arrhythmia, infarction extension, ventricular wall incoordination, EF index (50%), case fatality rate in hospital were much more in 3 and 4 group (p<0.05 or p<0.01).

**Conclusions** Different corresponding ST segment depression type in patients with ST segment elevate acute myocardial infarction can forecast the culprit artery and clinical prognosis.

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**GW23-e2000**

**EFFECTS OF PITAVASTATIN ON MONOCYTE CHEMOTACTIC PROTEIN-1 AND HIGH SENSITIVITY C-REACTIVE PROTEIN IN ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION PATIENTS**

doi:10.1136/heartjnl-2012-302920k.44

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**Objectives** To observe pitavastatin mediated inflammatory factor monocyte chemotactic protein -1 (MCP-1) and high sensitivity C-reactive protein (hs-CRP) in patient with acute ST-segment elevation myocardial infarction.

**Methods** 198 patients with consecutive elections ST-segment elevation acute myocardial infarction were collected from January 2007 to December 2012, aged 32–85 years old, ruled out infectious diseases, cancer, collagen diseases, application of immunosuppressive drugs. All patients underwent emergency coronary intervention, were randomly divided into control group and early intervention pitavastatin group (undergoing emergency percutaneous coronary intervention 30 min to 1 h after oral administration of pitavastatin 4 mg). ELISA was used to measure the contents of MCP-1 and hs-CRP.

**Results** (1) The levels of MCP-1 and hs-CRP in two groups increased 24 h after PCI (p<0.01); (2) The levels of MCP-1 and hs-CRP in the intervention group was statistically significant compared with the control group 24 h later.

**Conclusions** High-dose pitavastatin used in patients with Acute ST segment elevation myocardial infarction before percutaneous coronary intervention promotes MCP-1 and hs-CRP levels drop, reduce inflammatory response in patients.

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**GW23-e0999**

**CLINICAL CHARACTERISTICS OF 53 CASES OF NON-ST-SEGMENT ELEVATION ACUTE MYOCARDIAL INFARCTION**

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**Objectives** To explore the clinical features of non-ST-segment elevated acute myocardial infarction.

**Methods** The differences between non-ST-segment elevation group (group A) and ST-segment elevation group (group B) were compared, such as risk factors of coronary heart disease, clinical presentation and prognosis (angina pectoris during peri-infarction period, infarct extension or reinfection, cardiac pump failure, incidence of atrial fibrillation and ventricular arrhythmias, and hospital mortality within 4 week), peak serum myocardial enzymes and the results of coronary angiography.

**Results** No significant differences were found in risk factors of coronary heart disease, infarct extension or rein fraction (p>0.05). The incidence of angina pectoris during peri-infarction period in group A was higher than that in group B, but cardiac pump failure, incidence of atrial fibrillation and ventricular arrhythmias, and hospital mortality within 4 week were lower than that in group B (p<0.05). Serum myocardial enzymes reached the peak after (14.2±2.6) h in group A and (23.6±15.6) h in group B (p<0.05). Significant differences were found in incidence of multi-vessel lesions (81.1% vs 38.2%, p<0.05) and single-vessel lesion (18.9% vs 61.8%, p<0.05) by Coronary angiography between group A and group B.

**Conclusions** Clinical symptoms are often mild and hospital complication rate is often lower in patients with non-ST-segment elevated...
THE OUTCOMES OF GENDER DIFFERENCES AFTER PERCUTANEOUS CORONARY INTERVENTION IN SMALL CORONARY ARTERIES

GW23-e0113

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**Objectives** To examine whether gender-based differences existed in outcomes of percutaneous coronary interventions (PCIs) in the same coronary arteries.

**Methods** A total of 1350 consecutive CAD patients undergoing PCI with lesions ≤ 0.50 mm in reference vessel diameter were divided into male group and female group. Angiographic analysis was performed by independent observers. Statistical analysis was performed using R and SPSS software. A p value < 0.05 was considered statistically significant.

**Results** (1) Clinical characteristics: Members of the female group were older, and had higher rates of angina and comorbid conditions (diabetes mellitus and hypertension) but were less likely to have had prior surgical or percutaneous coronary revascularisation procedures. (2) Angiographic lesion characteristics: The characteristics were similar except that there were significantly more bifurcation lesions, less pre-TIMI grade 3 flow and less procedural success. (3) Half-year outcomes: there was no significant difference in the rate of MACEs or other subgroups (target lesion revascularisation, actual myocardial infarction, restenosis).

**Conclusions** Women have worse short-term outcomes after PCI when all coronary artery diameters are included. But when we select the same coronary artery diameters, women have similar rates of short-term MACEs. So maybe the diameter of coronary artery is the most important factor contributing to gender-based differences in outcomes of percutaneous coronary interventions.

PROGNOSTIC VALUE OF NT-PROBNP COMPLEMENTS THE GEACE SCORE IN PEOPLE WITH NON-ST-SEGMENT ELEVATION ACUTE CORONARY SYNDROME

GW23-e1170

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**Objectives** This study was designed to investigate whether admission N-terminal pro-brain natriuretic peptide (NT-proBNP) increase the prognostic accuracy of Global Registry of Acute Coronary Events (GRACE) risk score in the prediction of short-term prognosis after non-ST-segment acute coronary syndrome (NSTE-ACS).

**Methods** A total of 126 patients with Unstable angina 84 (66.7%) and non-ST-segment elevation Myocardial infarction 42 (33.3%) were studied and followed up to 30 days. Admission GRACE score and NT-proBNP levels were measured. The primary endpoint was 30–day incidence of major adverse cardiac events (cardiac death, recurrent ischaemia or myocardial infarction, unplanned revascularisation, new onset of congestive heart failure). Patients were divided into endpoints group and non-endpoints group. The receiver operating characteristic (ROC) curve was used to evaluate prognostic value of NT-proBNP level and GRACE score. The logistic regression models were used to assess the prognostic contribution of NT-proBNP level and GRACE score.

**Results** During the follow up, 14 primary endpoints were recorded including nine recurrent ischaemia or myocardial (64.3%), two unplanned revascularisation (14.3%) and three new onset of congestive heart failure (21.4%) and no cardiac death. The systolic blood pressure was significantly lower while heart rate, left ventricular ejection fraction (LVEF), Killip grading were significantly higher in the endpoints group than in non-endpoints group. The lnNT-proBNP level at admission (mean±SD 2.39±0.56 vs 2.13 ±0.59) and GRACE score ((mean±SD 162.48±33.15 vs 101.63 ±30.49) were significantly higher in the endpoints group than in non-endpoints group (all p<0.001). After GRACE risk stratification, lnNT-proBNP of high risk group was the highest among the three groups (p<0.001). According to NT-proBNP levels, patients were stratified into four groups by quartile. Compared with lowest, second, and third quartiles, the GRACE risk score was the highest in the fourth quartile (p<0.001). The lnNT-proBNP in patients with NSTE-ACS had positive correlation with their GRACE risk score (r=0.30, p<0.001).

**Conclusions** Both NT-proBNP level at admission and GRACE score were independent predictors for endpoints at 30 days in patients with NSTE-ACS. The prognostic criteria for NT-proBNP level was 608 pg/ml determined by ROC (p<0001). For GRACE score, the predictive value for endpoints was 0.718 (p=0.001) and the cut-off point was 156. Addition of NT-proBNP to the GRACE score, the predictive value for endpoints was 0.825 (p<0.001). In the logistic regression model, NT-proBNP and GRACE score were independent predictors of endpoints in the patients with NSTE-ACS.
Objective: To investigate related factor between \( ^{13}C \)-UBT Hp positive and upper gastrointestinal bleeding in patients with ACS during hospitalisation.

Methods: Prospective analysis of 160 patients with STEMI and NSTEMI hospitalised to the CCU from May 2011 to November 2011. To observe the prevalence of \( ^{13}C \)-UBT Hp positive of patients and 50 healthy persons as control group, at the same time, learn the incidence of upper gastrointestinal bleeding, and study the interrelation between bleeding and Hp positive, as well as various risk factors. The Patients all be followed up for 3 months, all MACE (include recurrent angina pectoric, readmitted in hospital for heart failure, upper gastrointestinal bleeding, death for all causes) will be recorded during the 3 months.

Results: 90 out of 160 patients are \( ^{13}C \)-UBT Hp positive (56%), whereas, the incidence of Hp infection in control group is 42%, the difference is statistically (p=0.04). There are no interrelation between age, sex, smoking, hypertension, diabetes mellitus and Hp infection in ACS patients (p>0.05), the prevalence of Hp infection is not different between STEMI and NSTEMI patients (p>0.05). There is no difference of serum lipid, hs-CRP, FIB between \( ^{13}C \)-UBT Hp positive and Hp negative group. 8 of 160 patients suffered from upper gastrointestinal bleeding during hospitalisation (5%), the prevalence of upper gastrointestinal bleeding makes no senses between Hp positive and Hp negative patients. Predictors of upper gastrointestinal bleeding included advanced age (≥70) (p=0.004), taken aspirin for long time (p=0.03), history of peptic ulcer (p=0.04) and bleeding (p=0.01), higher value of serum creatinine (>2 mg/dl, p=0.01), insertion of IABP (p=0.003).

Conclusions: 56% of these patients are suffered from Hp infection, significantly higher than that in control group. The prevalence of upper gastrointestinal bleeding in patients with STEMI and NSTEMI are still high (5%), advanced age, history of upper gastrointestinal bleeding and higher value of serum creatinine (>2 mg/dl) significantly increase the incidence of upper gastrointestinal bleeding. Hp infection may no be the predictor of upper gastrointestinal bleeding.
myocardial infarction (STEMI) group. Serum bilirubin and lipids were measured and compared among three groups.

**Results** Compared with control group, serum level of direct bilirubin (DBIL) and total bilirubin (TBIL) were significant lower in AP group but no significant difference between STEMI group and control group. DBIL and TBIL were significant higher in STEMI group than in AP group. LDL in both AP group and STEMI group were significantly higher than that in control group. In-direct bilirubin was no statistically difference among three groups. Spearman correlation showed that DBIL was negatively correlated with TC, LDL, VLDL and TBIL was negatively correlated with LDL in control group. DBIL was negatively correlated with TC, LDL in both AP and STEMI groups.

**Conclusions** Serum bilirubin influence the effects of Cholesterol in the progress of CAD, the effects of DBIL might be more meaningful.

GW23-e0531

**THE ANTICOAGULANT THERAPY OF HAEMODIALYSIS PATIENTS WITH ACUTE CORONARY SYNDROME**

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**Objectives** To evaluate the effect of different dose of anticoagulants in haemodialysis patients with acute coronary syndrome (not including ST-elevate myocardial infarction).

**Methods** 28 patients with ACS (not including ST-elevate myocardial infarction) were enrolled between March 2008 and March 2012 who started haemodialysis for 5–10 years in regular pattern. The patients were randomly divided into two groups: the routine group (n=12) and strengthen group (n=16). All patients were given routine therapy including regular haemarphinised haemodialysis (three times a week), rest, oxygen inhaling, antiplatelet, reducing blood lipid levels, controlling the blood pressure. The patients in the routine group were given the factor X a inhibitor fondapanarinux 2.5 mg every day except the haemodialysis days. The patients in the strengthen group were given fondapanarinux 2.5 mg every day including the haemodialysis days. The course of treatment was 7 days. Observe the symptom, electrocardiogram, cardiac troponin T, coagulation function (PT, APTT, INR) for 14 days.

**Results** One patient in routine group was died of heart failure, another patients in strengthen group exited because of gastrointestinal bleeding. The basic characteristics of the two groups were identical (p>0.05). Patients’ symptom relieved in (3.1±2.3) days in strengthen group and (5.0±3.6) days in routine group (p<0.05). Patients’ electrocardiogram returned to the origin in (4.5±2.1) days in strengthen group and (5.2±4.3) days in routine group (p<0.05). The cardiac troponin T of patients in strengthen group reduced to stable level in (4.7±5.2) days and (5.8±2.9) days in routine group (p<0.05). In the 3rd day and 5th day and 7th day and 9th day, the PT, APTT, INR in strengthen group were significantly longer than those in routine group (p<0.05).

**Conclusions** Strengthen anticoagulant therapy in haemodialysis patients with acute coronary syndrome (not including ST-elevate myocardial infarction) is more effective than routine therapy, but we must be care of the risk of haemorrhage.

GW23-e0549

**NEW-GENERATION DRUG-ELUTING STENTS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: A PROPENSITY SCORE MATCHED ANALYSIS**

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**Objectives** This study was aimed to compare everolimus-eluting stents (EES) with zotarolimus-eluting stents (ZES) in patients with acute myocardial infarction (AMI).

**Background** There is a paucity of data to exclusively evaluate the safety and efficacy of second-generation drug-eluting stents (DESs) in the setting of AMI.

**Methods** The present study enrolled 3309 AMI patients treated with ZES (n=1608) or EES (n=1701) in a large-scale, prospective, multicenter Korea Acute Myocardial Infarction Registry (KAMIR). Propensity score matching was applied to adjust for differences in baseline clinical and angiographic characteristics, producing a total of 2646 patients (1545 receiving ZES, and 1343 receiving EES). Target lesion failure (TLF) was defined as the composite of cardiac

E199
death, recurrent nonfatal myocardial infarction (Re-MI), or target lesion revascularisation (TLR). Major clinical outcomes at 1 year were compared between the two propensity score matched groups.

**Results** After propensity score matching, baseline clinical and angiographic characteristics were similar between the two groups. Clinical outcomes of the propensity score matched patients showed that despite similar incidences of Re-MI, in-hospital and 1-year mortality, patients in the EES group had significantly lower rates of TLF (6.5% vs 8.7%, p=0.029), and probable or definite stent thrombosis (0.3% vs 1.6%, p<0.001) as compared with those in the ZES group. Furthermore, there was a numerically lower rate of TLR (1.2% vs 2.2%, p=0.51) in the EES group than in the ZES group.

**Conclusions** In this propensity-matched comparison, EES appears to be superior to ZES in reducing TLF and stent thrombosis in patients with AMI.

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**ABSTRACTS**

**POSTCONDITIONING EFFECTS OF ORAL NICORANDIL TREATMENT ON PATIENTS WITH ACUTE ANTERIOR MYOCARDIAL INFARCTION**

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**Objectives** In recent years, the development of thrombolysis and percutaneous coronary intervention (PCI) have positive impacts on outcome of the patients with acute myocardial infarction (AMI), but the reperfusion injury followed by these treatments per se would lower the benefit. After carrying on a large amount of research, people have found that ischemic preconditioning can decrease the reperfusion injury and reduce the infarct size, which is a strong endogenous myocardial protective form of reducing reperfusion injury. But it must be operated in a transient time before myocardial ischemia, which is the bottleneck of its wide clinical application. But recent research has found that ischemic post conditioning can exert cardiac protective effect as well when operated after a short period of myocardial ischemia, which has become a hotspot of coronary heart disease therapy researches. Since the mitochondria potassium ATP (mito-KATP) channel is at the downstream of signal pathway of preconditioning and post conditioning, the activation of mito-KATP channel can directly induce preconditioning and postconditioning. Nicorandil is a medicine which can act as agonist of mito-KATP channel and has nitrates effect. The pharmacologic preconditioning caused by Nicorandil has been confirmed in animal experiments and clinical tests. By activating mito-KATP channel, nicorandil can induce pharmacologic post conditioning effect, limit the infarct size of the acute anterior myocardial infarction and decrease the reperfusion injury, which eventually form cardio protective effects. Besides, this effect is no related to nitrates effect.

**METHODS** A total of 312 patients with coronary artery diseases were diagnosed by coronary angiography in Beijing Anzhen Hospital. There were 204 male and 108 female patients. They took aspirin 75–100 mg per day more than 1 month before they were admitted to the hospital. We used light transmission aggregation to evaluate aspirin resistance with detection of optical platelet aggregation induced by arachidonic acid and adenosine diphosphate. It was divided into aspirin resistance (AR), semi-resistant to aspirin (ASR) and aspirin sensitivity (AS) according to the response of aspirin. We tried to investigate the gender differences and influential factors of aspirin resistance in patients with coronary artery disease.

**RESULTS**

**RESULTS** Coronary heart disease patients with AR, ASR, AR+ASR and AS followed by the percentage of women were 60.5%, 60.4%, 60.5%, 16.5%. Compared with men, women were more susceptible to AR and ASR. Logistic regression analysis showed that gender and age were significantly associated with AR and ASR.

**Conclusions** AR and ASR occurred easily in female patients with coronary artery disease than male and age was also a risk factor of AR and ASR.
GW23-e1476  CLINICAL APPLICATION OF DOMESTIC LONG BIODEGRADABLE POLYMER COATED SIROLIMUS ELUTING STENTS FOR TREATMENT OF LONG CORONARY ARTERY LESIONS

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Objectives To evaluate the efficacy and safety of domestic long biodegradable polymer coated sirolimus eluting stents (Excel stent, Shandong JW) for treatment of long coronary artery lesions.

Methods Our analysis reviewed retrospectively 125 patients with coronary artery disease due to long coronary lesions who received percutaneous coronary artery balloon expansion and stent implantation (PTCA+Stent) from June 2008 to June 2010. All patients were divided into two groups according to clinical information, number of stents and methods of operation: A group: a long stent in the target lesion (≥28 mm, long-stent group, 63 cases), group B: 2–3 short stents adjacent together in the target lesion (≤24 mm, short-stent group, 62 cases). Procedure time, x-ray exposing time, technical successful rate, contrast quantity, cost of surgery, and complication rate were compared between two groups. All patients were followed up in 1 year to observe clinical efficacy, major adverse cardiac events (MACE) and incidence of stent thrombosis.

Results Basic clinical conditions were no significant difference between two groups. Except the average diameter and length of stent, angiographic characteristics (site of the lesion, length of the lesion, degree of stenosis of the target vessel, incidence of chronic total occlusion) were no significant differences. The technical successful rate was 100% in two groups. The procedure time (0.5±0.2 vs 0.3±0.4 h, p<0.05), x-ray exposing time (5.6±1.2 vs 10.6±1.6 min, p<0.05), and contrast quantity (60±15 vs 100±20 ml, p<0.05) in long-stent group was less than that in short-stent group. The surgery costs in short-stent group increased significantly (p<0.01). One-year after surgery, the angiographic follow-up rates were 31.7% (20/63) in long-stent group and 29.0% (18/62) in short-stent group respectively. At the same time, in-stent restenosis rates were 5.0% (1/20) in long-stent group and 5.6% (1/18) (p=0.847) in short-stent group respectively. The clinical follow-up rates of two groups in 1 year were 100%. No deaths, myocardial infarction, and thromboembolic events occurred; the incidence of MACE was no significant difference between two groups (5.7% vs 6.8%, p=0.679).

Conclusions Retrospective analysis of our data indicates that it is effective, safe and feasible of domestic long biodegradable polymer coated sirolimus eluting stents for treatment of long coronary artery lesions, which are similar to the multiple short stents in the near and medium term.

GW23-e0987  SAFETY AND EFFICACY OF THROMBOLYSIS FOLLOWED BY EARLY PERCUTANEOUS CORONARY INTERVENTION VIA TRANSRADIAL ARTERY APPROACH IN PATIENTS WITH ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION

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Objectives This study was to investigate the safety and efficacy of thrombolysis followed by early PCI via transradial artery approach in patients with ST-segment elevation myocardial infarction (STEMI).

Methods From September 2009 to March 2010, all consecutive STEMI patients within 12 h from symptom onset or thrombolyis in the Department of Cardiology of the Second Hospital of Hebei Medical University were enrolled. All eligible STEMI patients were divided into two groups according to patients received thrombolyis or not: early PCI group (E-PCI group, patients received thrombolytic agents in non-PCI capable hospital and immediately transferred to receive early PCI) and primary PCI group (P-PCI group, patients received primary PCI). Coronary angiography (CAG) and PCI were performed immediately after admission via transradial artery approach for patients in both groups with standard technique. According to the results of angiography, PCI was performed unless the blood flow of IRA achieved TIMI flow grade 3 without significant stenosis. Thrombus score, TIMI flow grade (TFC) of IRA before and after PCI, corrected TIMI frame count (CTFC), TIMI myocardial perfusion grade (TMPG) post PCI were analysed. Bleeding complications was also observed and evaluated. All patients were followed up for 6 months to assess major adverse cardiac events (MACE).

Results A total of 161 cases were enrolled, with 53 cases in E-PCI group and 108 cases in P-PCI group. The patients in E-PCI group were younger than those in P-PCI group (51.36±12.24 vs 57.31±9.87, p=0.003). The other baseline clinical characteristics such as gender distribution, baseline levels of serum BNP, SCr and Hb, and the medication therapies were similar between the two groups (all p>0.05). The mean time from symptom onset to thrombolysis was 5.62±1.85 h in E-PCI group, and the time from thrombolysis to PCI was 5.13±3.0 h. Compared to P-PCI group, the mean time from onset to PCI was longer in E-PCI group (5.75±2.36 vs 6.03±3.19 h, p<0.001). There were no differences in door to balloon time and IRA distribution between the two groups. Of the 53 patients treated with thrombolysis, 51 patients underwent early PCI when transferred to our hospital except two patients who only underwent CAG. In the P-PCI group, 106 patients underwent primary PCI, while two patients underwent CAG. Before PCI procedure, the thrombus score of IRA in E-PCI group was lower, and the percentage of TIMI 3 flow was higher (both p<0.05) compared to those in P-PCI group. TFC of IRA after PCI was similar, and there was no significant difference in the volume of contrast medium (p>0.05). However, CTFC of IRA post PCI in E-PCI group was lower than that in P-PCI group (28.12±5.06 vs 30.89±7.47, p<0.05), and rate of TMPG 3 in E-PCI group was higher than that in P-PCI group (82.8% vs 68.0%, p<0.05). All of the implanted stents were drug-eluting stents. No differences were found in the stent implantations between the two groups (all p>0.05). There was a trend toward lower in the peak value of serum CK-MB in E-PCI group. No significant differences were found in the incidence of bleeding complications and hospital stay between the two groups. There was a trend of better left ventricular function 7 days after PCI in E-PCI group than that in P-PCI group. After 6-month follow-up, the left ventricular function was improved in both the two groups (all p>0.05), and there was still a better trend in E-PCI group. Overall, there was no significant difference in 6-month MACE between the two groups (p=0.977).

Conclusions The myocardial perfusion and left ventricular function were better in patients underwent thrombolysis followed by early PCI, without increases of bleeding complications and incidence of MACE. It is safe and efficacious for STEMI patients to receive thrombolysis followed by early PCI via transradial artery approach.
**ABSTRACTS**

**GW23-e2116 SHORT- AND LONG-TERM OUTCOMES OF CORONARY REVASCULARISATION IN PATIENTS WITH SEVERE LEFT VENTRICULAR DILATATION**

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**Objectives** Patients with coronary artery disease accompanied by severe left ventricular dilatation (LVD) are at higher risk for heart failure and death. However, their clinical and angiographic profiles, short- and long-term outcomes after revascularisation are unknown.

**Methods** A total of 4283 patients (median age 60.0 years; 77.4% male) undergoing coronary revascularisation in our centre from July 2003 to September 2005 were stratified according to end-diastolic dimension (EDD). Patients with severe LVD (EDD>70 mm), mild/moderate LVD (EDD 52.7 mm to 70.0 mm in males, EDD 48.3 mm to 70.0 mm in females), and no LVD (EDD<52.7 mm in males, EDD<48.3 mm in females) was compared for outcome analysis.

**Results** Patients with severe LVD had more co-morbidities and complex coronary lesions. Severe LVD in patients undergoing coronary revascularisation was an independent predictor of early and late mortality and adverse ischaemic outcomes.

**GW23-e2228 THE UTILITY RATE OF ELECTIVE PERCUTANEOUS CORONARY INTERVENTION IN PATIENTS WITH ST ELEVATION ACUTE MYOCARDIAL INFARCTION IN BEIJING, CHINA**

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**Objectives** Despite primary percutaneous coronary intervention (PCI) was the most effective way to reduce the mortality for the patients with ST elevation acute myocardial infarction (STEMI), the time delayed STEMI patients could undergo elective PCI. Few studies have reported the utility rate of elective PCI in STEMI patients on a population-based study in Beijing. To examine the utility of elective PCI among hospitalised STEMI patients in Beijing.

**Methods** The study was based on the ‘Beijing Acute Myocardial Infarction (AMI) Surveillance Platform’ data system, which contains the electronic records of all AMI cases admitted to tertiary hospitals or secondary hospitals in Beijing area during the year 2007 to 2009. The patients with STEMI aged 25 or over were included in this study. Patients with STEMI underwent PCI>24 h from the onset of ischaemic symptoms were defined as elective PCI.

**Results** Totally 31 400 patients (mean age 62.8±13.2 year, 72.8% male) with STEMI were recruited. Totally 41.7% of STEMI patients received PCI during hospitalisation in acute period. STEMI patients received early PCI and elective PCI were 23.0% and 19.5% respectively. From 2007 to 2009, elective PCI rate showed upward trend (12.8% in 2007 vs 24.0% in 2009, p<0.001). The tertiary hospitals had 1.8 times higher elective PCI rate than that in secondary hospitals (24.6% vs 8.7%, p<0.001). The elective PCI rate for Beijing suburb was lower than that for Beijing urban (19.2% vs 15.2%, p<0.001). Among STEMI patients received elective PCI, 45.7% received the elective PCI up to 7 days of onset of AMI. Hospitalised mortality was 13.4% for patients without PCI, while 1.8% for those who received PCI.

**Conclusions** PCI rate of hospitalised STEMI patients is still low comparing with other countries. Elective PCI rate shows upward trend from 2007 to 2009. Secondary hospitals still have a huge gap on elective PCI for STEMI patients. The rate of Beijing suburb patients is lower than Beijing urban.
Results

Conventional group, matched with the MNS group by the vessel and patients within the same study period were recruited in the conventional PCI. The radiation dosage for guidewire crossing in MNS group was also significantly lower than that in the conventional group (235.8 (134.9, 455.1) vs 364.4 (223.4, 547.2) μGy²; p=0.033). All the enrolled vessels were successfully intervened in both groups.

Conclusions

Intracoronary administration of anisodamine before PCI could improve the myocardial perfusion which may be result in the hemodynamic effects of anisodamine.

Objectives

Relative efficacy and safety of triple antiplatelet therapy (TAT, addition of cilostazol to aspirin and clopidogrel) compared with conventional dual antiplatelet therapy (DAT, aspirin and clopidogrel) remained controversial. This meta-analysis was performed to compare the risk of cardiac events and restenosis of TAT versus DAT in drug-eluting stents (DES) implantation patients.

Methods

We performed PUBMED, MEDLINE, EMBASE and Cochrane CENTRAL searches for randomised clinical trials of TAT versus DAT in patients after DES implantation. Five clinical trials (3526 patients) were involved in the meta-analysis. Period of clinical follow-up ranged from 9 to 12 months.

Results

TAT was associated with a 36% reduction in major adverse cardiac events (MACE) (OR=0.64; 95% CI 0.51 to 0.81, p<0.01), a 40% reduction (OR=0.60, 95% CI 0.44 to 0.80; p<0.01) in target vessel revascularisation (TVR), a 44% reduction (OR=0.56, 95% CI 0.34 to 0.91; p=0.02) in target lesion revascularisation (TLR) and a 47%/44% reduction in in-segment/in-stent restenosis (p<0.01) and lower in-segment/in-stent late loss (p<0.01). As regards to the safety assessment, there was no significant difference about the risk of stent thrombosis (OR=1.0, p=1.0) and bleeding (OR=1.18, p=0.49) between TAT and DAT group, while the risk of gastrointestinal trouble was significantly higher in TAT group (OR=2.46, 95% CI 1.25 to 4.86; p<0.01).

Conclusions

Addition of cilostazol to conventional DAT reduced the incidence of MACE, TVR and TLR in patients after DES implantation. TAT also reduced the risk of angiographic restenosis and late loss in patients after DES implantation.

Objectives

We performed a prospective randomised pharmacodynamic investigation of four antiplatelet regimens to compare different effects in arresting the reactivity of platelets by assessed the hemodynamic effects of anisodamine.

Methods

We selected 61 STEMI patients, with 31 ANI group and 30 CON group. Patients in ANI group received intracoronary bolus injection of anisodamine (2000 μg, 10 ml) over 2 min according to the heart rate and blood pressure, and the same volume of 0.9% sodium chloride in the CON group. The other medications and laboratory examinations were the same as phase 1. The primary end point was the level of TMFG after PCI, and the second end points were including the hemodynamic parameters, STR, peak level of CK-MB, TIMI flow grade and major adverse cardiac events after PCI.

Results

Seventy-six patients were prospectively enrolled, with 39 in ANI group and 37 in CON group. No significant differences in baseline clinical data and baseline angiography data were found (all p>0.05). Compared to CON group, the rate of TMFG 3 was higher in ANI group, while the CTFC was lower (both p<0.05). There was a mild increase of heart rate, SBP and DBP after administration of anisodamine (all p<0.05). There were significant differences in the peak level of CK-MB, LVEF and STR in the ANI group. The incidences of MACE were similar between the two groups.

Conclusions

Intracoronary administration of anisodamine before PCI could improve the myocardial perfusion which may be result in the hemodynamic effects of anisodamine.
ABSTRACTS

P-selectin expression on platelet membrane and the plasma levels of sCD40L and PDGF-BB. Meanwhile, we compared end events between groups during 6-months follow-up.

Methods We enrolled eighty patients with acute ST segment elevated MI according to the American Heart Association/American College of Cardiology criteria. Patients undergoing primary percutaneous coronary intervention were enrolled in a 2×2 factorial study (group A: clopidogrel 300 mg; group B: clopidogrel 600 mg; group C: clopidogrel 300 mg plus tirofiban; and group D: clopidogrel 600 mg plus tirofiban). All patients were aged >18 years and pretreated with 300-mg aspirin loading dose. The clopidogrel loading dose was given to all patients immediately after diagnosed and was followed by 75 mg daily. Tirofiban was administered as a bolus (10 μg/kg) followed by an infusion (0.15 μg/kg per minute) for 36 h after the procedure. We initiated cardiovascular intervention within 2 h after clopidogrel pretreatment. In addition, all patients had received β-blockers coadministered with 300-mg aspirin before catheterisation and 100 mg was administered daily thereafter. Enzyme linked immunosorbent assay was used to assess circulating levels of sCD40L and PDGF-BB. Flow cytometry were used to assess platelet reactivity. We obtained the venous blood sample at three point of time: before pretreatment, 24 h and 5 days after intervention, respectively.

Results (1) Posttreatment P-selectin expression was significantly reduced in all groups compared with baseline expression, whereas treatment with 500-mg clopidogrel alone had the least effect in P-selectin expression. In the groups not treated with tirofiban, a 600-mg loading dose of clopidogrel provided greater platelet inhibition throughout the first 24 h after stenting, whereas this effect to some extent was attenuated 5 days after intervention. Inhibition of P-selectin positive platelet was higher in patients treated with tirofiban plus clopidogrel compared with clopidogrel alone (p<0.05).

Conclusions A strategy of parenteral GPIIIb/IIIa inhibitor plus high-dose (600-mg) clopidogrel pretreatment administration is associated with superior platelet inhibition and lower MACE occurring compared with a strategy of high-dose (600-mg) or standard-dose (300-mg) clopidogrel loading alone. In the absence of a GPIIIb/IIIa inhibitor, 600-mg clopidogrel pretreatment provides better platelet inhibition than standard 300-mg dose. Administration with clopidogrel of more than 75 mg daily after loading dose will provide superior inhibition of the proliferative response of vascular smooth muscle cells after PTCA. These results require confirmation in a large-scale clinical trial.

DEATH OF ONE CASE FROM POSTOPERATIVE CARDIAC RUPTURE AFTER EMERGENCY PCI IN ACUTE INFERIOR MYOCARDIAL INFARCTION
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Objectives (1) Clinical Data: Patient, male, 67, was admitted to hospital due to the severe chest pain with vomiting and profuse sweating on 3 February 2011. He had history of hypertension and smoking. The blood pressure was 150/90 mm Hg. The ECG showed that the ST segments in II, III, and AVF leads had arched upward elevation for 0.3–0.5 mV. He was diagnosed as acute inferior myocardial infarction. The emergency coronary angiography showed that left main artery, anterior descending branch, and circumflex branch were normal, and the middle of right coronary artery had acute occlusions. The patient was given PCI operation successfully and antiplatelet therapy. The ECG and the echocardiogram were improved after PCI. In the fourth day after operation, he suddenly felt the chest distress, dizziness, and then faint and convulsion of the limbs when the patient passed a stool (the stool was not dry). The blood pressure could not be detected. So we gave cardiopulmonary resuscitation, but the patient died finally. The B ultrasound displayed large number of pericardial effusions. The cause of death of this patient was considered as the cardiac rupture.

Methods (2) Discussion: For acute myocardial infarction, the mortality in the hospital of emergency PCI condition has been dropped to about 10%. The main death causes are malignant arrhythmia, pump dysfunction after massive myocardial infarction or cardiac rupture. Compared with anterior myocardial infarction, cardiac rupture in inferior myocardial infarction is rarely possible due to the protective action of the diaphragm. This patient was given emergency PCI operation successfully, and had normal treatment after the operation. The patient died from the cardiac rupture in the fifth day of onset of illness, which was gone beyond our expectation.

Results The author analyses the possible reasons as follows: Firstly, although the patient was performed emergency PCI successfully, we considered that most of cardiac muscles in the infarcted area were still necrotic according to QS wave in ECG. The patient had not been the chest pain symptom in the past, which could infer that the culprit vessel of the patient before the myocardial infarction had not the high-grade stenosis and the ischaemic preconditioning process.

Conclusions The collateral circulation has not yet been open. After the unstable plaque rupture, the thrombosis blocked acutely. The far-end cardiac muscle had not protected and acute serious ischaemia existed. Most of cardiac muscles might be necrosis in the short period. The reperfusion therapy was made, but the effect was limited. Secondly, the patient was inferior myocardial infarction, and had smaller influences on the pump function. The patient with a comparatively good pump function had a higher pressure in the cardiac chamber during contraction period, and the risk of the cardiac rupture might increase. Thirdly, after the reperfusion therapy of the patient, the reperfusion injury would change the pathological process, and also the blood perfusion with the preferable infarct might influence the mechanism of the inflammatory cells and inflammatory factors which could accelerate the oedema and liquefaction of the necrosis, and make the peak time of the cardiac rupture ahead of time.

INTRA VASCULAR ULTRASOUND ASSESSMENT OF BORDERLINE CORONARY ARTERY DISEASE OF PATIENTS WITH CORONARY HEART DISEASE AND DIABETES
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Objectives Characteristics of the technical evaluation of intracoronary ultrasound in diabetic patients with coronary heart disease intermediate coronary lesions, as well as a variety of critical lesions and serum hs-CRP in the coronary angiography, in order to improve the diagnosis and treatment of borderline coronary artery disease strategy to provide a scientific basis.

Methods Randomly selected from January 2011 to January 2012 because of suspected coronary artery disease admitted to the First Affiliated Hospital of Kunming Medical College of Cardiology, informed consent and implementation of coronary angiography ruled a single coronary artery with critical lesions in 44 patients,
with Taiwan and coronary ultrasound. (Male 29 cases, 15 were female, the oldest 85 years old, minimum 41-year-old, average 64.20±10.27 years), diabetes group, 17 patients (12 males and 5 females, age 78 years, minimum 41-year-old, average 64.12±10.05 years); non-diabetic group of 27 patients (17 males and 10 females, aged 85 years old, minimum age of 41 years, an average of 64.26±10.64 years). Crown made the results, IVUS, and comprehensive judgment of the clinical indicators are in line with coronary heart disease. All patients were fasting blood 5 ml pumping 24 h before coronary angiography, using a SIEMENS the BN II automatic biochemical analyser and ancillary reagents immune scattering turbidimetry measured serum of hs-CRP. Crown made surgery Volcano Therapeutics, Inc. of Invision-Gold intravascular ultrasound diagnostic apparatus observation and storage lesion coronary artery external elastic membrane area (EEMA), minimal lumen area (LA), plaque area (PA) and plaque burden (PB), to calculate the eccentricity index (EI), remodelling index (RI). Age, sex, hyperlipidaemia, history of hypertension, diabetes history, smoking history and other relevant factors, access to cases collect objects lesions in patients with the nature, extent and clinical manifestations of discretionary intervention treatment and/or conservative treatment after discharge from hospital records and follow-up end when the patient’s clinical outcome. STSS17.0 statistical software to analyse the observational data, the difference was statistically significant p <0.05 sentence.

Results
1. In patients with coronary heart disease with or without diabetes and gender, age, smoking history has no correlation (p>0.05).
2. Diabetes group triglyceride levels than non-diabetic group (1.83±0.82 mmol/l vs 1.42±0.42 mmol/l, p=0.032).
3. No significant difference between diabetic and non-diabetic patients with coronary artery disease, coronary artery disease location (p>0.05), but more of the three lesions of diabetes (47.06% vs 11.11%, p<0.05), rather than diabetes single vessel disease (59.26% vs 17.65% more, p<0.05).
4. The intermediate coronary lesions of the diabetic group of soft plaque detection rate in non-diabetic group (58.82% vs 14.81%, p=0.002), no difference in the fibrous plaque, calcified plaque and mixed plaque detection rate (11.76% vs 29.63%, p=0.169; 17.64% vs 33.33%, p=0.255; 11.76% vs 22.22%, p=0.381). Gender, age, hypertension, with or without smoking, blood lipids are normal and patch types had no correlation (p>0.05).
5. Plaque eccentricity index of the critical lesions of the diabetic group is slightly larger than non-diabetic group, but the difference was significant (0.21±0.06 vs 0.19±0.05, p=0.177). Critical lesions of the diabetic group, minimal lumen area of less than non-diabetic group (3.66±0.81 vs 6.77±2.14, p<0.001), plaque burden and plaque area in the diabetic group than non-diabetic group (73.11±3.57 vs 55.75±5.49, p<0.001; 9.76±1.87 vs 7.89±1.91, p=0.003), and critical vascular lesions external elastic membrane area, the proximal distal reference Vascular the EEMA average, remodelling index was no significant difference between the two groups (13.53±2.39 vs 14.76±2.91, p=0.159; 14.94±2.65 vs 16.24±2.34, p=0.094; 1.06±0.33 vs 0.89±0.34, p=0.107).
6. Diabetes group received PCI stent implantation is higher than non-diabetic group (52.38% and 44.44%, p=0.013).
7. Under the guidance of the IVUS, the success rate was 100%, 0% of hospital MACE event rates.
8. To complete the follow-up of 35 cases (85.37%) patients with symptoms of more than relieved. Diabetic group (17.65%) of the three cases of recurrent angina, one patient died of reinfection (5.88%); non-diabetic group two cases of recurrent angina (7.41%), death (0%).
9. Diabetes serum hs-CRP measured value slightly higher than the non-diabetic group (5.30±0.772 and 4.21±0.945, p<0.01), and the IVUS detection of soft plaques in patients with serum hs-CRP measured value is significantly higher than other plaques types of patients (5.65±0.72 4.51±0.80,3.99±0.62,3.98±0.88, p<0.001), the other patch types of the soft spot between serum hs-CRP measured value difference not statistically significant (4.51±0.80 and 3.99±0.62; 4.51±0.80 and 3.98±0.88; 3.99±0.62 and 3.98±0.88, p>0.05).

Conclusions
1. In diabetic patients with coronary artery disease, coronary critical lesions like eccentric soft plaque are mostly smaller minimum lumen area, lumen loss in the area of the high side, large plaque area, plaque burden and emphasis. required interventional treatment ratio is high, suggesting that coronary heart disease and diabetes, even if only critical lesions are more serious than non-diabetic patients.
2. Coronary angiography and IVUS both imaging diagnostic techniques joint use, not only can improve the diagnostic accuracy of critical coronary lesions, but also to guide treatment decisions on the critical lesions, reducing post-PCI MACE rate, suggesting that diabetes mellitus suspected coronary heart disease population to the implementation of coronary angiography, where appropriate, plus line IVUS examination is worth promoting.
3. Significantly increased in patients with serum hs-CRP level of critical coronary lesions in patients with diabetes mellitus and critical lesions of the soft plaque, suggesting that serum hs-CRP test might be a critical lesion severity and guide treatment of the judgment coronary one of the important basis of the decision-making. 4. known coronary heart disease risk factors, age, sex, with or without a history of smoking, whether the severity of hypertension and other critical coronary lesions seems to be no predictive value, and with or without diabetes and with or without fat The severity of hyperlipidaemia on the prediction of critical coronary lesions is of great significance, should be like as a necessary check of suspected coronary artery disease population.
ABSTRACTS

GW23-e0581 THE SAFETY AND EFFICACY OF DUAL-AXIS ROTATIONAL CORONARY ANGIOGRAPHY IN THE DIAGNOSIS OF CORONARY ARTERY DISEASE
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Objectives Standard coronary angiography (SA) is performed in multiple stationary views at different angles around the patient to evaluate the severity and location of the lesions. The procedure exposes patients to the potential health risks from contrast and radiation exposure. During dual axis rotations the x-ray system rotates with trails pre-programmed around the patient with a single injection. This study evaluates the efficacy and safety of Dual-axis rotational coronary angiography (DARCA) (X-per Swing) in the diagnosis of coronary artery disease.

Methods From March to July in 2010, consecutive 79 patients undergoing diagnostic coronary angiography were randomised to either standard angiography group (n=39) or X-per Swing angiography group (n=40). We measured the quantity of contrast utilised and radiation exposure. The number of additional angiography needed to be performed was used to evaluate and compare the efficacy of two methods.

Results Both groups were successfully completed angiography. All angiograms were reviewed for CAD screening efficacy by two independent invasive cardiologists. There was a 44% reduction in contrast utilisation in the X-per Swing group compared to the standard group (29.28±5.06 ml vs 52.02±12.05 ml, p < 0.001). Additionally, there was a 50% reduction in radiation exposure in the X-per Swing group compared to the standard group (6900±5445.03 mGycm² vs 16857±3884.68 mGycm², p < 0.001). Neither arrhythmia nor chest pain differed in both groups. X-per Swing can provide a significant reduction of contrast and radiation exposure while maintaining comparable diagnostic accuracy and safety. With an auto-inject system (ACIST CMS2000) that can autoinject contrast by interlinkage, operator can stay far away from x-ray tube, which enable the x-ray exposure to be extremely reduced.

Conclusions X-per Swing (DARCA) represents a new angiographic technique which is equivalent in terms of image quality and is associated with less contrast use, radiation exposure and procedural time than SA.

GW23-e0439 EARLY ROUTINE POST-FIBRINOLYSIS ANGIOPLASTY COMPARED TO PRIMARY ANGIOPLASTY IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND ST-SEGMENT ELEVATION
doi:10.1136/heartjnl-2012-302920.l.17

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Objectives Patients with acute myocardial infarction and ST-segment elevation (STEMI), primary angioplasty is frequently not available or performed beyond the recommended time limit. We designed a randomised, controlled study to evaluate whether lytic-based early routine angioplasty represents a reasonable reperfusion option for victims of STEMI irrespective of geographic or logistical barriers.

Methods A total of 234 STEMI patients were randomised to full tenecteplase followed by stenting within 3–12 h of randomisation (early routine post- fibrinolysis angioplasty;118 patients), or to undergo primary stenting within 3 h of randomisation (primary angioplasty; 116 patients). The primary endpoints were epicardial reperfusion and no-reflow; the extent of myocardial damage, determined by means of the infarct size and the extent of left ventricular myocardial damage, determined by means of the left ventricular function. The secondary endpoints were the acute incidence of bleeding and the 6-month composite incidence of death, reinfarction, stroke, or revascularisation.

Results Early routine post-fibrinolysis angioplasty resulted in higher frequency (p < 0.01) of complete epicardial reperfusion (TIMI 3 epicardial flow) following angioplasty. The primary angioplasty group resulted in higher frequency (p < 0.01) of no-reflow. Both groups were similar regarding infarct size (the level of Troponin T (cTnT), p > 0.05); 6-week left ventricular function (ejection fraction, p > 0.05); major bleeding (p > 0.05) and 6-month cumulative incidence of the clinical endpoint (p > 0.05).

Conclusions Early routine post-fibrinolysis angioplasty safely results in better epicardial perfusion and lower no-reflow than primary angioplasty. Despite its later application, this approach seems to be equivalent to primary angioplasty in limiting infarct size and preserving left ventricular function.

GW23-e0451 A CLINIC STUDY FOR FORECAST, PREVENTION, THERAPY TO NO-REFLOW PHENOMENON DURING PERCUTANEOUS CORONARY INTERVENTION TO CORONARY HEART DISEASE PATIENTS
doi:10.1136/heartjnl-2012-302920.l.18

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Objectives Discussing the forecast features of no-reflow phenomenon from clinical and coronary angiographic morphologic of crisis coronary in percutaneous coronary intervention for coronary heart disease, and searching prevention, therapy methods to no-reflow phenomenon.

Methods 618 CAD patients were operated PCI, according to whether or not have no-reflow phenomenons, finding danger factors from clinical and coronary angiographic feature for forecast no-reflow phenomenons, observing effect of powerful antithromb in acute coronary syndrome patients to reduce no-reflow phenomenons and using tirofiban as prevention method to no-reflow phenomenons before PCI after coronary angiography in patients with danger factors, and comparing bleeding cases. observing improve
effect of nitroglycerine and tirofiban to no-reflow phenomenons, and let these patients with higher blood pressure level after PCI, continue using tirofiban after PCI. Observing major adverse cardiac effects to 3 months after PCI.

Results

No-reflow phenomenon rate was 5.7% in this study, acute coronary syndrome patients, crisis coronary lumen more than four mm, right coronary artery disease, diffuse disease, coronary ectasia with stenosis disease, thrombosis sign found in crisis vascular have more no-reflow phenomenon occurrence (all p<0.05). Powerful antplatelet before PCI can reduce no-reflow phenomenon effect (p<0.001), without increase bleeding case (p>0.05). Using tirofiban by coronary inject before PCI can reduce no-reflow phenomenon (p<0.001), when no-reflow phenomenon occurred, using nitroglycerine by coronary inject can improve no-reflow phenomenon for 19.5% patients, using tirofiban by coronary inject can improve no-reflow phenomenon for 89.1% patients, there has a obvious different between two methods (p<0.001), tirofiban can improve no-reflow phenomenon more effectively to those usefulness with nitroglycerine. Keep higher blood pressure level and continue using tirofiban after PCI can reduce no-reflow phenomenon to ACS patients, inject tirofiban in coronary can improve no-reflow phenomenon effective, and this method was safety. It is worthy for clinic use.

GW23-e1894

INITIAL AND LONG-TERM CLINICAL OUTCOMES OF UNPROTECTED LEFT MAIN STENTING USING DRUG ELUTING STENTS

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Objectives

To evaluate the initial and long-term clinical outcomes of patients with unprotected left main (ULM) stenosis undergoing percutaneous coronary intervention (PCI) with drug eluting stents (DES) at XJing Hospital Centre in real world patient population.

Methods

After excluding acute ST-segment elevation myocardial infarction and bailout stenting, 798 patients treated for ULM disease with DES from January 2003 to December 2011 at Xijing Hospital were enrolled. The clinical outcomes of ULM treated with DES were evaluated by major adverse cardiac events (MACE) and stent thrombosis (ST) during in-hospital period and after long-term follow-up respectively. MACE was defined as cardiac death, non-fatal myocardial infarction (MI) and clinically driven target lesion revascularisation (TLR). ST was evaluated in accordance with the Academic Research Consortium (ARC) definitions.

Results

The mean age of study population was 62±10 years, 649 (81%) patients were male, 199 (25%) patients were diabetic, and the mean ejection fraction was 54±11%. 71 (9%) patients had an ostial and 27 (3%) had a lesion (nondistal subgroup), 700 (88%) patients had a bifurcation lesion (distal subgroup). In distal subgroup, 416 (59%) patients were treated with 1 stent (1-stent subgroup) and 284 (41%) were treated with 2 stent (2-stent subgroup). Among 2-stent subgroup, 74 (11%) patients were treated with crush (crush subgroup), 86 (12%) were treated with crush (crush subgroup), 45 (6%) were treated with kissing (kissing subgroup) and 81 (12%) were treated with T stenting (T subgroup). Angiographic and clinical successes of PCI were obtained in all patients. During the in-hospital period, MACE occurred in 7 (0.8%) patients including 5 (0.6%) cardiac deaths and 2 (0.2%) MIs. one patient had definite (died) and four patients had probable stent thrombosis (1 had a MI and 3 died). During the long-term follow-up duration of 27±20 months, MACE occurred in 176 (22%) patients including 25 (3%) cardiac deaths, 16 (2%) MIs and 155 (17%) TLRs. six patients had probable (died) and 12 patients had possible stent thrombosis (2 had MI and 10 died). There were no significant differences in in-hospital MACE rates between nondistal and distal subgroup, between 1-stent and 2-stent subgroup and among different 2-stent technique subgroups. After long-term follow-up, the TLR rate was significantly higher in distal
subgroup than in nondistal subgroup (18% vs 9%, p<0.05), the MACE rate was significantly higher in 2-stent subgroup than in 1-stent subgroup (28% vs 20%, p<0.05), and the different 2-stent technique subgroups showed similar long-term outcomes. The total stent thrombosis rates were also no significant differences between nondistal and distal subgroup, between 1-stent and 2-stent subgroup and among different 2-stent technique subgroups.

**Conclusions** Treatment of ULM with DES is feasible and safe with good in-hospital and acceptable long-term clinical results. Compared with ostial and shaft lesion, distal bifurcation lesion is associated with a worse long-term TLR rate. 1-stent technique had a better long-term MACE rate than 2-stent technique when distal bifurcation lesion was treated, whereas different 2-stent techniques had similar clinical outcomes.

**GW23-e1078**

**THE ROLE OF GEMININ GENE ON PROLIFERATION OF VASCULAR SMOOTH MUSCLE CELL**

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**Objectives** The proliferation of vascular smooth muscle cells (VSMCs) plays an important role in the pathogenesis of vascular diseases. Geminin is a 25 kDa nuclear protein, which regulate the proliferation of cells through inhibiting the initiation of DNA replication and regulation of cell cycle. The aim of this study was to examine the possible involvement of Geminin in VSMC proliferation.

**Methods** VSMCs were growth-arrested by incubating in DMEM containing 0.1% normal calf serum for 24 h and then were treated with angiotensin II (Ang II 10^{-8} mol/l), norepinephrine (NE 10^{-8} mol/l) for 48 h to induce proliferation. Immunofluorescence was used to determine the distribution of Geminin protein. We used RNA interference to knock down the Geminin Gene. CCK-8 was used to determine the proliferation of cell.

**Results** Compared with growth-arrested VSMC, the expression of Geminin was obviously increased after treatment of Ang II and NE and the distribution of Geminin protein gathered in nuclear more, Geminin was obviously increased after treatment of Ang II and NE. Compared with growth-arrested VSMC, the over-replication of proliferation of VSMC was not affected and the over-replication of DNA did not appear.

**Conclusions** Our data demonstrated that Geminin did not participate proliferating and regulating of cell cycle in VSMC. Geminin specific expression in the status of proliferating VSMC indicated that it can be seen as a marker of cell proliferation.

**GW23-e2647**

**STAGED HYBRID PROCEDURE FOR MYOCARDIAL REVASCULARISATION IN THE ELDERLY WITH CORONARY ARTERY DISEASE AND HIGH RISK STRATIFICATION**

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**Objectives** To summarise the experience of Staged hybrid procedure for Myocardial Revascularisation in the elderly with coronary artery disease and high risk stratification.

**Methods** Between August 2008 and December 2011, 10 elderly patients with coronary heart disease and high risk stratification, aged 60–75 years old, received staged hybrid procedure for Myocardial Revascularisation. Of the 10 patients, there was acute myocardial infarction (culprit lesion in circumflex or right coronary artery) concomitant with chronic total occlusion of left anterior descending artery in five cases. There was multivessel disease with bifurcation stenosis or calcification of left anterior descending artery and low left ventricular ejection fraction in 2, chronic obstructive pulmonary disease in 2, chronic pericarditis in 1. Off-pump coronary artery bypass grafting was performed after percutaneous coronary intervention with drug-eluting stents for Myocardial Revascularisation.

**Results** All procedures were uneventful. The 10 patients received 13 stents, 15 grafts and 1 Balloon angioplasty. The average number of revascularisation was 2.9 per patient. Chest tube loss was 486±172 ml. There was no perioperative myocardial infarction and in-hospital death with a postoperative hospital-stay of 8.5±1.6 days. During a follow-up of 2–28 months. There was no recurrent angina, late intervention and mortality with New York Heart Association class I of cardiac function in 9, classfllin 1.

**Conclusions** Staged hybrid procedure seems a safe and effective alternative for myocardial revascularisation in the elderly with coronary artery disease and high risk stratification. The short-term results are satisfactory. The mid-term and long-term results need further investigation.

**GW23-e2646**

**CLINICAL OUTCOMES OF ZOTAROLIMUS-ELUTING STENTS VERSUS THE FIRST GENERATION SIROLIMUS-ELUTING STENTS AND PACLITAXEL-ELUTING STENTS: A META-ANALYSIS OF RANDOMISED TRIALS**

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**Objectives** To compare the clinical outcomes after placement of zotarolimus-eluting stent (ZES) and the first generation stents (sirolimus-eluting stent (SES) and paclitaxel-eluting stent (PES)) in patients with coronary artery disease.
GW23-e2253 PROTECTIVE EFFECT OF TRIMETAZIDINE ON MYOCARDIAL INJURY AND RECURRENT ANGINA AFTER PERCUTANEOUS CORONARY INTERVENTION
doi:10.1136/heartjnl-2012-302920l.24
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Objectives To explore the effect of trimetazidine (TMZ) on the myocardial injury related to percutaneous coronary intervention (PCI) and left heart function after PCI.

Methods 132 patients with unstable angina pectoris admitted for elective PCI were randomly assigned to two groups to receive or not an acute load dose of 60 mg of TMZ prior to the intervention and routine dose of 20 mg tid after it. The frequency and the increase in the level of cTnI after successful PCI were measured before and 16–18 h after PCI. Heart function evaluated by echocardiography and major adverse cardiac events (MACE, including death, re-infarction and target vessel revascularisation) at 12 months after the procedure were also compared.

Results 106 patients who successfully undergoing elective PCI were finally enrolled, 51 in TMZ group and 55 in control group. Post-procedural cTnI levels were significantly reduced in the TMZ group at 16–18 h (p<0.05). The frequency of patients with an increase in cTnI of two times the upper limit of the control range (0.05 ng/ml) was significantly decreased in the TMZ group (p<0.05). At 12 months follow-up, left ventricular ejection fraction after PCI was significantly improved in the TMZ group (p<0.05).

Conclusions Trimetazidine can limit the post-PCI cTnI release and improve left heart function after PCI.

GW23-e0373 ATORVASTATIN COMBINED WITH PROBUCOL CAN REDUCE SERUM URIC ACID’S LEVEL DURING PERIOPERATIVE PERIOD OF INTERVENTION
doi:10.1136/heartjnl-2012-302920l.25
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Objectives To observe the effect of different doses of atorvastatin combined with different dose of probucol on the level of serum uric acid in patients undergoing coronary angiography or percutaneous coronary intervention (PCI).

Methods 208 cases enrolled in our study were randomly divided into three groups: Standard combining treatment group (n=55): Atorvastatin 20 mg qn and Probucol 0.25 g/bid; Intensively combining treatment group (n=79): Atorvastatin 40 mg qn and Probucol 0.5 g/bid, with a further dose of Atorvastatin 40 mg and Probucol 0.5 g 2 h before the angioplasty; Intensive Atorvastatin group (n=74): Atorvastatin 40 mg qn, with a further dose of Atorvastatin 40 mg 2 h before the angioplasty. Blood urea nitrogen (BUN), serum creatinine (Scr), serum uric acid (SUA), and estimated glomerular filtration rate (eGFR) (through MDRD method) of all patients were tested at the times of 24 h before and 24 h after the procedure.

Results (1) After operation, BUN of all groups decreased; Scr in Standard combining treatment group and Intensive Atorvastatin group increased significantly; while eGFR decreased only in Standard combining treatment group (p<0.05); there was no significant difference in Scr and eGFR between 24 h and 24 h after intervention in Intensively combining treatment group (p>0.05); (2) SUA in Standard combining treatment group and Intensively combining treatment group decreased significantly after operation (p<0.05), while no significant change in Intensive Atorvastatin group (p>0.05). (3) For hypertensive patients, Scr in Standard combining treatment group and Intensive Atorvastatin group increased significantly (p<0.05), as eGFR of the two groups decreased; in Intensively combining treatment group, BUN and SUA decreased markedly, while Scr and eGFR showed no significant changes.

Conclusions Preoperative combination treatment of Atorvastatin and Probucol could reduce perioperative serum uric acid’s level, what’s more with a intensive treatment of future dose of Atorvastatin 40 mg and Probucol 0.5 g 2 h before the angioplasty could also improve CIAKI. For hypertensive patients, intensively combining treatment could not only reduce serum uric acid’s level, but also improve CIAKI.

GW23-e1498 DURATION OF DUAL ANTIPLATELET THERAPY AND OUTCOMES AFTER LEFT MAIN PERCUTANEOUS CORONARY INTERVENTION
doi:10.1136/heartjnl-2012-302920l.26
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Objectives Despite treatment recommendations for at least 12 months of dual antiplatelet therapy (DAPT) following drug-eluting stent revascularisation, the optimal duration of DAPT after left main percutaneous coronary intervention remains controversial. We sought to evaluate differences in late safety outcomes relative to DAPT duration in patients treated with drug eluting stents in left main coronary artery.

Methods 216 patients undergoing successful primary percutaneous left main coronary intervention of dual antiplatelet therapy with aspirin (100 mg/d) and clopidogrel (75 mg/d) were eligible for enrolment in this randomised, double-blind, placebo-controlled trial from September 2008 to October 2011 at our institution. Patients were analysed according to continuation or discontinuation of DAPT at a 12-month landmark, excluding patients with events prior to the landmark, and outcomes were followed up to 36-months after stenting. Among patients who were event-free at 12-months, clopidogrel was discontinued in 88 patients and was continued for longer than 36-months in 94 patients. The main outcome for our current analysis was Target Vessel Failure (TVF), defined as target vessel-related cardiac death or myocardial infarction and target vessel revascularisation. Secondary outcomes included stent thrombosis (ST). (Un) adjusted hazard ratios (HR) for TVF were calculated with Cox regression.

Results Through 3 years, risk-adjusted ischaemic event rates did not significantly differ between groups: 12 versus ≥36 months: death (2.6% vs 2.3%), myocardial infarction (MI, 0.2% vs 1.0%), and definite/probable stent thrombosis (ST, 0.2% vs 0%). Composite events also did not statistically vary between DAPT durations. In multivariable analysis, 12-month versus longer DAPT duration was not associated with increased likelihood of thrombotic events at 3-year follow-up. Even after addition of identified independent predictors for TVF, adjusted TVF hazards were comparable. Major bleeding was negligible across groups.

Conclusions 12-month dual antiplatelet therapy seems to be feasible after left main percutaneous coronary intervention in Chinese patients.
OBJECTIVES
To evaluate the effect of intracoronary injection of tirofiban in treatment of acute myocardial infarction with recurring slow flow or no-reflow in the culprit vessel during delayed PCI.

METHODS
When the residual stenosis of the culprit artery was balloononed and (or) stents were implanted during delayed PCI 8–14 days after acute myocardial infarction, Coronary angiography showed that the slow flow or no-reflow in culprit artery occurred in 76 patients with culprit vessel recanalisation, which randomly divided into control group (57 cases): intracoronary injection of 200 µg of nitroglycerine; tirofiban group (59 cases): intracoronary bolus of tirofiban (10 µg/kg, more than 3 min) on the basis of injection of nitroglycerine. Flow grade (TIMI) of culprit artery immediately after PCI and incidence of cardiovascular adverse events in 1 week and 30 days after PCI were compared between two groups.

RESULTS
Compared with control group, there was better flow grade (TIMI) of culprit artery immediately after PCI (p=0.006), lower incidence of cardiovascular adverse events in 1 week after PCI (p=0.01), but similar incidence of it in 30 days after PCI in tirofiban group (p=0.08). There were no difference about the rate of bleeding complications and thrombocytopenia between two groups in a week after surgery.

CONCLUSIONS
Intracoronary injection of tirofiban has better advantage in terms of improving coronary blood flow and short-term clinical efficacy on acute myocardial infarction with recurring slow flow or no-reflow during delayed PCI.

WHAT IMPACTS DOOR-TO-BALLOON TIME IN REMOTE AREA OF CHINA—AN ANALYSIS FROM A SINGLE CENTRE

OBJECTIVES
Our study was aimed to analyse the impact factors and identified which factors significantly prolonged the DTB time in the west of China.

METHODS
We analysed the DTB time and its components from January 2008 to December 2010 in 301 consecutive patients presenting with STEMI in our hospital. Then, we determined which factors significantly prolonged the DTB time.

RESULTS
The median DTB time of all the patients was 149±78 min, the group was divided by DTB time, the ≤120 min group and the>120 min group. The median DTB time of two groups were 87±29 min and 201±68 min respectively (p=0.000). In the ≤120 min group, more patients (68.1%) presented to our hospital during working hours (p=0.000) while in the>120 min group more patients (65.2%) presented during off hours (p=0.000). Moreover, more patients (49.3%) presented when the interventional doctors was on site (p=0.000) in the ≤120 min group. Factors that significantly lengthened DTB time included the prolonged time of consultation by cardiology doctor (p=0.000), the prolonged time of explaining patient’s condition to the family (p=0.000), intervention doctor was off duty (p=0.000), having the symptom of slight chest pain (p=0.000), presenting during off hours (p=0.000).

CONCLUSIONS
The tertiary care general hospital in the remote area, the prolonged time of consultation by cardiology doctor and explaining patient’s condition to the family really accounted for the majority of reperfusion delay. Besides, lacking of interventional doctors usually resulted in DTB time delay during off hours. Therefore, directly activating the catheterisation laboratory by emergency department, strengthening the doctor to know the seriousness of early reperfusion, spreading propaganda of PCI among the masses, and increasing the numbers of interventional doctors will shorten DTB time more.
associated with higher procedural and medium-term complication rates. It has been technically difficult because it should be done with precise stent placement in ostium and absence of side branch compromise. The Szabo technique consists of side branch wiring through most proximal stent strut as well as main branch wiring through stent lumen. The side branch wire or anchor wire prevents stent advancement beyond ostial segment and makes possible the accurate stent implantation in ostium. The purpose of this study is to evaluate the safety, feasibility and success rate of Szabo technique by analysing technical, angiographic and IVUS (Intravascular Ultrasound) findings.

Methods We retrospectively analysed 39 PCIs in 39 patients with a significant lesion at a coronary artery ostium which was treated percutaneously using Szabo technique in The General Hospital of Chinese People’s Armed Police Forces’ cath lab. The procedure was defined as technically successful if there was neither stent loss nor second guide wire pull back during stent advancement. A successful procedure from angiographic point of view was defined as a precise stent implantation at ostium without side branch compromise. We also defined successful procedure from IVUS point of view consisting of accurate stent placement in ostium without proximal protrusion and without any stent uncovered area.

Results A total of 39 patients with 28 (71.8%) males, 21 (53.8%) diabetes, 25 (64.1%) hypertension, 27 (69.2%) hypercholesterolemia and 11 (28.2%) smokers or former smokers were enrolled in this study. They aged from 45 to 79 years with a mean age of 65 ±12 years. 6F and 7F guiding catheter were used in 35 (89.7%) and 4 (10.3%) patients separately. The access was radial in 31 (79.5%) and femoral in 8 (20.5%) patients. The culprit vessel was left anterior descending (LAD) in 26 (66.7%), right coronary artery (RCA) 5 (12.8%), circumflex-ostial marginal (LCX-OM) 3 (7.7%), and posterior descending (PDA) 5 (12.8%). IVUS was performed through culprit vessel in 30 (76.9%) and was also done in side branch in 9 (23.1%) patients after stent implantation. The procedure was technically successful in 36 (92.3%) patients. All technically successful patients had angiographic success (100%). IVUS examination of culprit vessel showed accurate stent placement in ostium 29 (96.7%) and slight stent proximal protrusion in 1 (0.3%) patients.

Conclusions This study shows that Szabo technique is safe and feasible for PCI in ostial coronary artery lesions with a high angiographic success rate. There was a high percentage of cases with accurate position of stent in ostium confirmed by IVUS.

[CORRELATION BETWEEN FRACTIONAL FLOW RESERVE AND QUANTITATIVE CORONARY ANGIOGRAPHY PARAMETERS IN INTERMEDIATE CORONARY ARTERY STENOSIS]

GW23-e0673 PREVENTION OF CONTRAST-INDUCED NEPHROPATHY WITH ASCORBIC ACID

doi:10.1136/heartjnl-2012-302920l.32
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Objectives A single-center prospective randomised controlled trials was performed, 149 patients were divided randomly into control group (n=78, receiving only 0.9% sodium chloride solution for routine hydration) and intervention group (n=71, based on routine hydration receiving vitamin C intravenous infusion, 3.0 g, 2–4 h before operation, and oral vitamin C, 1.0 g, on day 1, 2, respectively, after operation). The total dosage of intravenous and oral vitamin was 5.0 g. The renal function and the occurrence of adverse cardiac events were observed after operation.

Results There was no difference between ascorbic acid group and control group in mean peak increase in serum creatinine measured within 48 h after coronary angiography, the primary study end point (0.11±0.18 vs 0.08±0.08 mg/dl, p=0.07). The incidence of contrast-induced nephropathy, a secondary end point defined as increase of either ≥25% or ≥0.5 mg/dl in serum creatinine, was 6.14% in ascorbic acid-treated patients (5/78) and 5.63% in control group patients (4/71), a nonsignificant difference (p=0.73). There were also no differences between the 2 groups in the in hospital clinical outcomes and time of hospital stay.

Conclusions Ascorbic acid pretreatment for short-term at high dose do not prevent the decline in renal function after administration of contrast medium in patients with baseline renal insufficiency undergoing coronary angiography.

GW23-e0961 CLINICAL CONTRAST RESEARCH OF OPTIMAL TIME WINDOW IN DIRECT PCI TREATMENT OF ELDERLY PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

doi:10.1136/heartjnl-2012-302920l.33
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Objectives To investigate the optimal time window in treatment of elderly patients with acute myocardial infarction and primary percutaneous coronary intervention (PCI).
Methods 196 patients were divided into three groups according to their symptom-to-balloon time: group A (<3 h, n=48), group B (≥3 h, <6 h, n=67) and group C (≥6 h, <12 h, n=81). Achievement of TIMI grade 3 blood flow, degree of ST-segment resolution, left ventricular ejection fraction (LVEF) and the incidence of major adverse cardiac events (MACE) in hospital were compared among the three groups.

Results The rate of postoperative TIMI grade 3 and LVEF in group A was significantly higher than those in group B and group C. The incidence of no ST-segment resolution and MACE in hospital in group A were significantly lower than those in group B and group C. There were no differences between group B and group C in terms of TIMI grade 3 achievement, ST-segment resolution, LVEF and incidence of MACE in hospital.

Conclusions Compared with PCI 3 h after the onset of symptom, early PCI (<3 h) can improve the rate of TIMI grade 3 achievement, myocardial reperfusion and LVEF; and reduce MACE in hospital.

Clinical Efficacy and Security of Urokinase and (or) Verapamil in Improving No—Reflow Phenomenon of Percutaneous Coronary Intervention

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Objectives To investigate clinical efficacy and security of urokinase and (or) verapamil in improving no-reflow phenomenon of percutaneous coronary intervention.

Methods 68 patients with acute coronary syndrome (ACS) appeared no-reflow phenomenon of the target vessel during percutaneous coronary interventions, and were given nitroglycerine to coronary artery firstly. 64 patients (94.11%) had no improvement in result and then were divided into three groups at random: group A (n=21) were given the urokinase (10–50)×10^4 U and verapamil 0.5–1.5 mg by alternate injection to coronary artery; group B (n=19) were given the verapamil 0.5–2.0 mg by injecting to coronary artery; group C (n=24) were given the urokinase (20–60)×10^4 U by injecting to coronary artery.

Results There were 21 cases in A group (100%, p<0.01), 17 cases in B group (89.47%, p<0.05), 19 cases in C group (79.17%, p<0.05), whose TIMI blood stream improved to three degrees.

Conclusions No-reflow phenomenon is related to distal microthrombus forming and convulsing of the target vessel. It is safe and effective to inject small dosage of urokinase and (or) verapamil to coronary artery, and is worth using widely in the treatment.

The Clinical Efficacy and Safety Study of PCI Remedial Treatment after The

doi:10.1136/heartjnl-2012-302920.35

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Objectives To evaluate the efficacy and safety of PCI remedial treatment after the failure of intravenous thrombolytic therapy in the aged patients with acute myocardial infarction (AMI).

Methods 59 patients with acute ST-segment elevated acute myocardial infarction (STEMI) were divided into two groups according to the age: group A (<65 years) and group B (≥65 years). If the infract-related artery (IRA) failed to effectively open after thrombolytic therapy, coronary angiography (CAG) would be carried out. If the IRA blood flow during the CAG was below TIMI 3 level, and there were still more obvious chest pain and (or) the ST-segment elevation in the ECG leads corresponding to infarction, the PCI remedial treatment on IRA was completed except for emergency PCI contraindication. The effective opening ratio of thrombolytic therapy, PCI treatment success ratio and complications were compared between two groups.

Results Compared with group A, the effective opening ratio of thrombolytic therapy in group B was lower, but PCI treatment success ratio after the failure of intravenous thrombolytic therapy was no significant difference between two groups. The major complications after PCI such as intracranial haemorrhage and gastrointestinal bleeding and so on didn’t increased significantly in group B.

Conclusions PCI remedial treatment after the failure of intravenous thrombolytic therapy has significant clinical efficacy and safety in the aged patients with AMI.

Patients With Single Coronary Artery Malformations and Acute Inferior Myocardial Infarction Undergoing Emergency PCI: 1 Case

doi:10.1136/heartjnl-2012-302920.36

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Objectives

1. Clinical Data: Patient, male, 48 years old, chest pain 5 h, aggravation 4 h, was admitted to hospital on 9 February 2012.

Methods

2. Discussion: Single coronary artery malformation is rare, and it is origin from single opening to supply with entire heart blood.

Results This patient appeared chest pain and chest tightness aggravation in short time, companion with hypotension, alternation accelerated ventricular arrhythmia with sinus bradycardia, ST segment re-elevation, the necrotising Q wave deeper in intraoperative reperfusion therapy. Reperfusion therapy made ischemic-injured-myocardium worse, aggravated myocardial cells injury, even necrosis. In preoperative and postoperative period, daily ECG showed that QRS waves had obvious variation. In preoperative day showed QR waves (R>Q), intraoperative period showed QS waves and R wave disappeared. The third postoperative day showed QR waves, the fourth day showed QR waves (R<Q), the fifth day showed QR waves (R>Q). It explained that reperfusion injury induced part myocardial stunning, and the stunned myocardium recuperated activity within a few days.

Conclusions Experiences: First, if conventional method of doing CAG failed to find the coronary openings, abnormal coronary openings should be considered. Second, single coronary artery malformations is rare, down opening and acute occlusion of RCA increase the difficulty of CAG and PCI. Third, when do emergency PCI, we should pay special attention to ischaemia-reperfusion injury. Reperfusion is a double-edged sword, it can provide timely help for part ischemic myocardium, also can make part ischaemic-injured-myocardium worse, aggravated myocardial cells injury, even necrosis. Myocardial stunning may be the main performance of aggravated injury, and stunned myocardium recuperated activity within a few days. In postoperative days, daily ECG may be found QRS waves dynamic variation.
GW23-e0454  COMPARISON OF ISOEFFECTS AND SAFETY OF ISODOSE CLOPIDOGREL AND IMPORTED CLOPIDOGREL ON PCI PATIENTS

Objectives To compare the efficacy and safety of Talcorn and Plavix on PCI.

Methods 1798 patients with CAD to undergo CAG+PCI were divided to two groups, including Talcorn group (n=1104), Plavix group (n=694). 300 mg loading dose clopidogrel was oral before PCI and 75 mg/d foreword 1 year. There were follow-up 3–28 month to survey the incidence rate of MACE of combination end point of acute, subacute, late stage, very late stage stent thrombus and AMI, cardiac death, stroke and correlated adverse reaction of bleed, major bleed, gastrointestinal complaint, and etc.

Results There were no significant differences in the incidence of target vessel revascularisation and combination end point between Talcorn group and Plavix group (2.2% vs 3.3%, 2.6% vs 4.2%, X² value 2.176, 3.287, p value 0.140, 0.070, respectively). There were no significant differences in the incidence of stent thrombus and cardiac death between Talcorn group and Plavix group by Fisher’s exact probability (0.5% vs 0.6%, 0 vs 2 patients, p value 0.440, 0.149, respectively). There were no significant differences in the incidence of bleed and major bleed between Talcorn group and Plavix group (1.6% vs 2.9%, 0.2% vs 0.4%, p value 0.072 and 0.380, respectively). The incidence of regression of WBC in Talcorn group was fewer than Plavix group (0.9% vs 2.4%, X²=6.866, p=0.009). There were no significant differences in survival without event and accumulation MACE hazard analysed by Kaplan-Meier survival analysis (X²= 3.458 and 1.076, p=0.064 and 0.300).

Conclusions Effects and safety of isodose Talcorn used in under-went PCI patients are similar to those of Plavix.

GW23-e0450  CLINICAL OBSERVATION FOR ACUTE ST ELEVATION MYOCARDIAL INFARCTION PATIENTS WITH POST-FIBRINOLYSIS ANGIOPLASTY AND PRIMARY ANGIOPLASTY

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Objectives To observe the treatment effect and safety of the STEMI patients with Post-fibrinolysis Angioplasty.

Methods 212 STEMI patients were divided into two groups according to clinical therapy. One group accepted Post-fibrinolysis Angioplasty (n=104), the other group took Primary Angioplasty (n=108). Compared the TIMI flow, TIMI myocardial perfusion, left ventricular function and bleeding event, the compound endpoints between two groups in infusing the infarction related artery (IRA) after 30 days followup.

Results the baselines of two group were similar, the TIMI 3 grade were higher in Post-fibrinolysis Angioplasty than Primary Angioplasty (67% vs 13.7%, p<0.001), after PCI, the TIMI 3 grade were similar in two group, but TMP 3 grade were higher in Post-fibrinolysis Angioplasty than Primary Angioplasty (50% vs 25.3%, p=0.03), follow up data were similar in left ventricular function and bleeding event, the compound endpoints between two groups.

Conclusions Post-fibrinolysis Angioplasty is a safety, efficacy and economical treatment method and this therapeutic methods will be worthy for deeply search to treat AMI in clinic.
after PCI, 10 min to peak, 30 min down to preoperative levels; and 6-keto-PGF$_2\alpha$ in both groups showed a transient ischaemic decline, 10 min to restore to the preoperative level after PCI.

Conclusions The change of PAE, TXB$_2$ and 6-keto-PGF$_2\alpha$ levels in patients with coronary heart disease after PCI, were associated with platelet activation.

**GW23-e1414**  
CYP2C19 LOSS-OF-FUNCTION POLYMORPHISMS, STENT THROMBOSIS, BLEEDING EVENTS, AND MORTALITY IN PATIENTS WITH CORONARY STENT PLACEMENT

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Objectives Several studies indicated that CYP2C19 loss-of-function polymorphisms have a higher risk of stent thrombosis (ST) after percutaneous coronary interventions (PCIs). However, this association has not been investigated thoroughly in Chinese population. In this study, we aimed to determine the effect of CYP2C19 loss-of-function polymorphisms on the occurrence of ST and other adverse clinical events in Chinese population.

Methods The study population included 1068 consecutive patients undergoing intracoronary stent implantation after pre-loading with 600 mg of clopidogrel. CYP2C19*2 and CYP2C19*3 were genotyped by use of TaqMan SNP Genotyping Assay. The adverse clinical events recorded were death, ST, myocardial infarction, and bleeding events. The primary end point of the study was the incidence of definite ST within 1 year following PCI. The secondary end point was clinical outcome 1 year after the procedure.

Results The cumulative 1-year incidence of ST was 0.88% in patients with the extensive metabolizers (EMs) (CYP2C19*1/*1 genotype carriers), 4.67% for patients with the intermediate metabolizers (IMs) (CYP2C19*1/*2 or *1/*3 genotype carriers), and 10.0% for patients with the poor metabolizers (PMs) (CYP2C19*2/*2, *2/*3 or *3/*3 genotype carriers) (p<0.001). One-year event-free survival was 97.5% in patients with EMs, 96.5% in patients with IMs, and 92.0% in patients with PMs. (p=0.014). Multivariate analysis confirmed the independent association of CYP2C19 loss-of-function allele carriage with ST (p=0.009) and total mortality (p<0.05).

Conclusions Carriage of CYP2C19 loss-of-function alleles increases the risk on ST and total mortality after PCI in Chinese population.

**GW23-e2267**  
THE CLINICAL ANALYSIS OF VAGOVAGAL REFLEXES AFTER HEART CORONARY INTERVENTION WHILE PULLING OUT ARTERIAL SHEATH

doi:10.1136/heartjnl-2012-302920l.43

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Objectives To explore the causes and prevention of vascular vagovagal reflexes (VVRs) occurred in the process of pulling out the arterial sheath after cardiac intervention operation.

Methods A total of 3518 patients with elective coronary angiography, percutaneous transluminal coronary angioplasty or coronary artery stenting were divided into eight groups: pure coronary angiography group, PCI group, the old group, the young group, the Men group, the Woman group, femoral artery approach group and radial artery approach group. The incidence of vascular vagovagal reflexes were compared between groups.

Results Vascular vagovagal reflexes in 52 patients occurred in the process of pulling out the arterial sheath after cardiac intervention operation.

Conclusions The femoral artery approach, PCI and old age can increase the incidence of vascular vagovagal reflexes and the femoral artery approach might be the main factor.

**GW23-e2295**  
PROTECTION OF N-ACETYLCYSTEINE FOR PATIENTS WITH CONTRAST INDUCED NEPHROPATHY AFTER PERCUITANEOUS CORONARY INTERVENTION TREATMENT

doi:10.1136/heartjnl-2012-302920l.42

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Objectives This paper aims to explore whether there is a preventive and protective effect of N-acetylcysteine for patients with contrast induced nephropathy after percutaneous coronary intervention treatment.
THE FEASIBILITY OF PERCUTANEOUS TRANSRADIAL CORONARY INTERVENTION FOR CHRONIC TOTAL OCCLUSION (CTO)

Methods 80 patients, 37 of which were remote myocardial infarction, 38 unstable angina, five chronic stable angina, were accepted angiography via radial access. Angiography revealed there were 45 patients with three-vessel disease, 19 two-vessel disease, 16 single vessel disease and 48 patients with left anterior descending artery CTO, 15 left circumflex artery, 17 right coronary artery. Guidewires of CrosswireNT, Miracail3, 4.5, 6, 9, 12, conquest 9, 12 (PRO) were used in percutaneous transradial coronary intervention for chronic total occlusion.

Results The success rate of transradial PCI was 80% (64 of 80 cases), with 145 stents implanted, and the causes of failure included failure to pass the guidewire through the lesion in nine of 16 failure cases, failure of balloon passage in seven cases, failure of cardiac tamponade in no case.

Conclusions The radial artery might be a feasible vascular route in coronary interventions for CTO, with comparable procedural success and no access site complications.

A RARE CASE OF CLOPIDOGREL HYPERSENSITIVITY COMBINATION WITH UPPER GASTROINTESTINAL BLEEDING

Methods He was treated with antihistamines and proton pump inhibitors without clopidogrel discontinuation or steroids, after which a daily dose of 75 mg clopidogrel was well tolerated.

Results No major adverse events occurred during a follow-up period of 6 months.

Conclusions Oral anti-histamines in clopidogrel hypersensitivity seem to be a safe method to reduce the risk of coronary stent thrombosis in patient complicating with gastrointestinal bleeding.

EFFECT OF MYOCARDIAL PROTECTION OF INTRACORONARY ADENOSINE IN PATIENTS WITH ACUTE CORONARY SYNDROME DURING ELECTIVE PERCUTANEOUS CORONARY INTERVENTION

Methods We enrolled 100 consecutive patients with acute coronary syndrome who were scheduled for elective percutaneous coronary intervention. Patients were randomised into group A (adenosine 50 μg, n=45), group B (control saline, n=52). Assessments of CK-MB and cTnI were used to assess myocardial necrosis before and after PCI.

Results No significant differences were observed between the two groups with regard to baseline and angiographic characteristics. There were no significant differences in the CK-MB and cTnI between the two groups.

Conclusions Our randomised trial showed that preprocedural intracoronary administration of adenosine does not provide benefit in terms of peri-procedural myonecrosis in patients undergoing elective coronary angioplasty.
risk of acute occlusion of LM and tearing left coronary sinus, therefore, it need to quickly handle emergencies. We should grasp the following principles: Firstly, avoid repeated angiography. Repeated angiography can lead to CAD further expansion to distal end of LAD, and lost the opportunity of interventional therapy. Secondly, has the risk of tearing coronary sinus. Once tearing coronary sinus, can lead to two results, right coronary artery occlusion and ascending aortic dissection. So, to keep in mind, once formed left main coronary artery dissection, avoid repeated angiography. But emergency interventional therapy, implant stent to avoid the further expansion of dissection.

**Results** Experiences and lessons: Firstly, grasp the position of CAG, if no contrast agents, according to the head of catheter whether into the coronary artery opening. Secondly, along with the heart beating to preliminary determine the head of the catheter whether into the coronary artery opening. Secondly, develop a good habit to always pay attention to pressure monitoring of the coronary artery opening. If has pressure ridge, contrast agent shouldn’t be vigorous and rapid bolus. For the patient, the biggest lesson is that we did not pay great attention, when the opening of LM has lesions.

**Conclusions**

GW23-e2001 CLINICAL SIGNIFICANCE OF THE LEVELS OF HMGB1 BEFORE AND AFTER PERCUTANEOUS CORONARY INTERVENTION

Faquan Li, Wei Liao, Yihong Yang, Faquan Li. The Affiliated Hospital of Gannan Medical College

**Objectives** To observe the levels of HMGB1 in the coronary circulation before and after percutaneous coronary intervention (PCI) in the patients with coronary heart disease and provide a guide to clinical drug usage.

**Methods** Blood was obtained from the coronary sinus before and after PCI. The levels of HMGB1 were determined by the ELISA.

**Results** 206 patients with unstable angina and 209 patients with stable angina pectoris were compared, we found patients with unstable angina HMGB1 was significantly higher than those with stable angina before PCI (p<0.05). The levels of HMGB1 were significantly increased after PCI, 50 min to reach the peak, then back to normal at 120 min. both had the same trend.

**Conclusions** The levels of HMGB1 in patients with coronary heart disease were different between stable angina pectoris and unstable angina, and increased after PCI, It may related plaque rupture.

GW23-e1475 LONG-TERM FOLLOW-UP OBSERVATION OF DOMESTIC BISULPHATE CLOPIDOGREL AFTER PCI IN ACUTE CORONARY SYNDROME

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**Objectives** To observe the efficacy and safety of domestic clopidogrel after PCI in acute coronary syndrome.

**Methods** From July 2003 to March 2007, totally 352 patients with acute coronary syndrome (ACS), which were underwent PCI successfully in our hospital, were given dual antiplatelet therapy such as aspirin and domestic bisulphate clopidogrel (75 mg/d, trade name Taijia, Shenzhen Salubris Pharmaceutical Co., Ltd. production) before and after surgery. Clopidogrel was used at least 1 year and reduced to 50 mg/d in the second year after surgery. At last the longest lasted for 5 years. Primary endpoint events were observed within 5 years such as myocardial infarction, recurrent angina, death, stent thrombosis, in-stent restenosis and adverse reactions (symptoms, blood analysis, fecal occult blood, liver and kidney function).

**Results** Adverse cardiovascular event rate (<5%) and adverse drug reactions (<1%) were very low within 5 years after operation.

**Conclusions** It is effective and safe of dual antiplatelet therapy, combined with domestic clopidogrel, in patients with acute coronary syndrome after PCI in long-term follow-up.
grouping and 101 to 400 group (76.3% was 78.7%, p<0.05). 128-SCTCA diagnosis of distal white tube lesion sensitivity, positive predictive value were lower than those near the middle of the white tube (p<0.05).

**Conclusions** 128-SCTCA in Intermediate risk group of DWKE model with coronary artery calcification, lesion and lumen diameter.

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**GW23-e2112**  
THE SECURITY, MEDIUM-TERM AND LONG-TERM EFFECTS OF SIX FRENCH TRANSRADIAL PERCUTANEOUS CORONARY INTERVENTION FOR PATIENTS WITH UNPROTECTED LEFT MAIN CORONARY ARTERY LESIONS  
doi:10.1136/heartjnl-2012-302920l.52

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**Objectives** To study the clinical security, medium-term and long-term effects of six French transradial percutaneous coronary intervention for patients with unprotected left main coronary artery lesions.

**Methods** Our study investigated 61 patients with unprotected left main coronary artery lesions treated by six French transradial percutaneous coronary intervention in our hospital between January 2008 and December 2009. The mean age of these patients was 66.05±10.02 (total scope: 44–87). Of the 61 cases, 40 had hypertension and 14 had diabetes mellitus. 22 patients had a history of smoking. The average left ventricle ejection fraction was (62.96–86) and the average plasma creatinine level was (82.92±18.30) μmol/l (total scope: 44–130). Patients enrolled in the study underwent clinical evaluation of MACE after the procedure. (The deadline is 31 October 2011).

**Results** Procedural success was achieved in all cases. A total of 67 stents were implanted. No in-hospital death occurred. Mean clinical follow-up period was (26.25±5.92) months (total scope: 19–44 months). MACE developed in six cases (9.8%) during the follow-up period, including 2 death (3.3%) and four case of target lesion revascularisation (6.6%). Compared with low-risk group (SYNTAX score < 32,(From the study of SYNergy between percutaneous coronary intervention with TAXus and cardiac surgery trail)), MACE was increased in the high-risk group of the patients (SYNTAX score>32).

**Conclusions** Six French transradial percutaneous coronary intervention for patients with unprotected left main coronary artery lesions is safe, feasible and highly successful, bringing about medium-term or long-term good outcomes. Patients in the low-risk group (SYNTAX score <=32) have better clinical prognosis compared with high-risk group (SYNTAX score>32).
ABSTRACTS

The incidence of VTE in patients undergoing EPS and RFCA is considerable high. Procedure duration is potential to be a risk factor of TE. Better pharmacological thromboprophylaxis is considered to be essential, particularly in those patients with presented with manifested accessory pathways, 13 concealed accessory pathways. All accessory pathways were ablated with temperature controlled between 55 and 60°C and energy between 15 and 50 W for 60–90 s at sinus rhythm.

Results Radiofrequency catheter ablation was successful in all 20 patients. Of them, two patients occurred transient complete atroventricular block, two patients developed complete right bundle branch block. Other 16 patients showed no complications.

Conclusions Radiofrequency catheter ablation of parahisian accessory pathway is safe and effective under accurate mapping and low energy at sinus rhythm.

**GW23-e2061** COMPARATIVE STUDY BETWEEN RIGHT VENTRICULAR OUTFLOW TRACT AND RIGHT VENTRICULAR APEX PACING ON CARDIAC FUNCTION
doi:10.1136/heartjnl-2012-302920m.4
Faquan Li, Wei Liao, Zhanglin Yan, Faquan Li. The First Affiliated Hospital of Gannan Medical College

Objectives To evaluate cardiac function change in patients using the right ventricular outflow tract and right ventricular apex pacing.

Methods 119 patients with bradyarrhythmias in our hospital were consecutive selected, cardiac pacemaker implantation are in line with class one indications. exclude, chronic atrial fibrillation, cardiac function three or four grade (NYHA), acute coronary syndrome and other serious medical diseases. And 60 patients randomly selected for right ventricular outflow tract pacing (DDD), (group A). 59 cases (group B), selected for right ventricular apex pacing in. Both groups were no significant difference with age, gender, type of arrhythmia, breast function.

Results The two groups according to the cumulative percent ventricular pacing (cum% VP >50% <100%, 42 cases in group A, 38 cases in group B, between the two groups was not statistically significant; but the left ventricular ejection fraction (LVEF) in group A higher than in group B, and B-type natriuretic peptide (BNP) decreased in group A compared with group B (p<0.05). Group A after 18 months compared with preoperative LVEF has a certain degree increased, BNP decreased (p>0.05), group B after 18 months compared with preoperative LVEF slightly lower, with a certain degree of increased BNP (p>0.05).

Conclusions Right ventricular outflow tract pacing can improve heart function compared with right ventricular apex pacing, and to some extent improve heart function compared with preoperative too.

**GW23-e2040** THE INCIDENCE OF VENOUS THROMBOEMBOLISM AND ITS RISK FACTORS FOLLOWING ELECTROPHYSIOLOGIC STUDY AND RADIOFREQUENCY CATHETER ABLATION IN PATIENTS WITH CARDIAC ARRHYTHMIA
doi:10.1136/heartjnl-2012-302920m.5

1Yong Sun, 2Jian an Wang. 1Department of Cardiology, Second Affiliated Hospital, College of Medicine, Zhejiang University; 2Department of Cardiology, Second affiliated Hospital, College of Medicine, Zhejiang University

Objectives The incidence of VTE in patients undergoing EPS and RFCA is considerable high. Procedure duration is potential to be a risk factor of TE. Better pharmacological thromboprophylaxis is considered to be essential, particularly in those patients with presented with manifested accessory pathways, 13 concealed accessory pathways. All accessory pathways were ablated with temperature controlled between 55 and 60°C and energy between 15 and 50 W for 60–90 s at sinus rhythm.

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**GW23-e2061** COMPARATIVE STUDY BETWEEN RIGHT VENTRICULAR OUTFLOW TRACT AND RIGHT VENTRICULAR APEX PACING ON CARDIAC FUNCTION
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Results The two groups according to the cumulative percent ventricular pacing (cum% VP >50% <100%, 42 cases in group A, 38 cases in group B, between the two groups was not statistically significant; but the left ventricular ejection fraction (LVEF) in group A higher than in group B, and B-type natriuretic peptide (BNP) decreased in group A compared with group B (p<0.05). Group A after 18 months compared with preoperative LVEF has a certain degree increased, BNP decreased (p>0.05), group B after 18 months compared with preoperative LVEF slightly lower, with a certain degree of increased BNP (p>0.05).

Conclusions Right ventricular outflow tract pacing can improve heart function compared with right ventricular apex pacing, and to some extent improve heart function compared with preoperative too.
potential risk factors. The ACT measurement should be repeated to maintain the ACT more than 300 s during the procedure. Procedure duration is potential to be a risk factor. The incidence of VTE in patients with additional heparin was greater than the patients without additional heparin. While, both ablation (OR=1.330, 95% CI 0.666 to 2.658) and adipositas (OR=0.311, 95% CI 0.402 to 1.621) did not appear to be related to TE. Smoking habit influenced negatively the incidence of VTE (OR=0.311, 95% CI 0.107 to 0.904). Prettreatment of aspirin had no relation to the occurrence of VTE (OR=1.055, 95% CI 0.537 to 2.072). Additional heparin was required most in the patients with RF ablation, more introducer sheaths and longer length of duration to maintain the ACT more than 300 s during the procedure. The incidence of VTE in patients undergoing EPS and RFCA is considerable high. Procedure duration is potential to be a risk factor of TE. Better pharmacological thromboprophylaxis is considered to be essential, particularly in those patients with potential risk factors.

Results All 176 PVs in 44 patients could be mapped by the HDMM and CARTO. About 43.2% of the PV ostial anatomies were matched very well between the two different map images. The point-to-point straight distance between the HDMM-guided map and CARTO-guided map is \(6.20 \pm 1.44\) mm. The distance in some PV segments between the two images is nearly 5 mm. The area of circumferential right PV (CRPV) in the two views is \(8.12 \pm 2.48\) mm\(^2\) in CARTO map, \(9.37 \pm 1.84\) mm\(^2\) in HDMM map respectively (p=0.013). The area of circumferential left PV (CLPV) is \(8.12 \pm 2.48\) mm\(^2\) in CARTO, \(9.82 \pm 2.53\) mm\(^2\) in HDMM respectively (p=0.071). The CRPV perimeter in CARTO and HDMM is \(11.63 \pm 1.95\) mm vs \(11.87 \pm 1.72\) mm (p=0.471), the CLPV \(11.29 \pm 1.59\) mm vs \(11.12 \pm 1.71\) mm (p=0.573). The comparison of the CARTO-guided PV anatomy image, the HDMM-guided one still has some discrepancies, which maybe explain a part of reasons why the high-density mesh ablator (HDMA) has a high acute PVI rate but low long-term efficiency.

GW23-e1327 DECREASED PLASMA GLUCOSE CONCENTRATION PREDICTS LEFT ATRIAL THROMBUS IN PATIENTS WITH ATRIAL FIBRILLATION

Shauntao Ma, De Li, Dachun Yang, Bing Tang, Yongqian Yang. General Hospital of PLA Chengdu Military Area Command Department of Cardiology

Objectives This study examines the predictors of left atrial (LA) thrombus in candidates for atrial fibrillation (AF) catheter ablation. Methods From January 2010 to December 2011, 72 consecutive patients with nonvalvular AF were enrolled. Patients with valvular heart disease, stroke, deep vein thrombosis, or pulmonary embolism were excluded. All patients underwent transesophageal echocardiography (TOE) to detect LA thrombus. Several potential risk factors for thrombus were defined: aging, male, smoking index, hypertension, systolic/diastolic blood pressure, diabetes, fasting plasma glucose (FPG), dyslipidemia, triglyceride, cholesterol, uric acid, LA diameter, ischaemic cardiomyopathy, congestive heart failure and persistent AF. Results The incidence of thrombus was 8/72 (11.1%) without therapeutic anti-coagulation. Patients with thrombus had lower plasma glucose level, mean 4.58±0.45 mm vs 5.77±1.22 (p=0.008). In univariate analysis, smoking index (OR=1.002 with 95% CI 1.000 to 1.003), plasma glucose concentration (OR=0.043 with 95% CI 0.005 to 0.379), triglyceride (OR=4.942 with 95% CI 1.585 to 15.410), high density lipoprotein (OR=0.044 with 95% CI 0.002 to 0.840), LA diameter (OR=1.210 with 95% CI 1.070 to 1.369), and persistent AF (OR=6.600 with 95% CI 1.224 to 35.602) were significantly associated with LA thrombus. In multivariate analysis, plasma glucose concentration (OR=0.010 with 95% CI 0.000 to 0.894) was independently associated with LA thrombus. Conclusions In conclusion, decreased plasma glucose concentration is an independent risk factor of LA thrombus in patients with AF.

GW23-e1698 CLINICAL EFFECT ANALYSIS OF ATRIAL FIBRILLATION AFTER CATHETER ABLATION

Liuxwen Liuxwen. shanxidayiyuan

Objectives Atrial fibrillation (AF) is one of the most common cardiac arrhythmias, which is harmful to human health and...
quality of life. AADs are limited in clinical because of their side effects, so in recent years, RFCA has become one of the effective treatments for AF whose clinical application is showing a clear upward trend. In order to explore the efficacy and safety of catheter ablation for AF, we have followed up the patients with AF undergoing catheter ablation in this study.

**Methods** A cohort of 39 patients with AF after RFCA from 2008 to 2011 was studied. 25 male and 14 female; the average age was 61.08±10.17 (36–74) years old. Among them, there were 32 cases with paroxysmal AF and seven cases with persistent AF. 19 cases were complicated with hypertension, six cases with coronary heart disease, seven cases with diabetes and two cases with cerebral infarction. All the patients suffered from obvious clinical discomfort symptoms. Although treated by one to two kinds of AADs already, the effects were poor. CPVI was performed in the all of them (five cases occurred, 13.51%). The endpoint of the ablation was complete electronic isolation of all the pulmonary veins (PVs). The patients who were converted to sinus rhythm in the cause of ablation were validated by Lasso electrodes, and could not be evoked atrial arrhythmia again. However, those who failed to be converted to sinus rhythm would be validated after electroversion for those who weren’t isolated PVs completely; the conducted gap was initially posited by the mapping catheter, and the earliest fragmented potential was targeted for ablation till the complete electronic isolation of all the PVs.

**Results** (1) The results of catheter ablation: 37 cases were successfully achieved immediately the endpoint after the ablation. Surgery average time of operation was (174.89±53.05) min, average X-ray exposure time (53.62±16.44) min, average discharge time (40.78±11.61) min; No severe complications such as pulmonary vein stenosis, pericardial tamponade, cardio-esophagus fistula, stroke occurred during and after the procedure. One case with paroxysmal AF was converted to auricular flutter after ablation, who were failed to be converted to sinus rhythm by synchronised cardioversion, but converted after Marshall Ligament ablation; three cases with persistent AF undergoing ablation were turned to be sinus rhythm by intravenous irapbullitt. Five cases developed atrial tachyrhythmias in 5–7 days after ablation: four cases appeared paroxysmal AF with fast ventricular rate; one case appeared paroxysmal atrial tachycardia; another one was sinus bradycardia, junctional escape. All the patients didn’t suffer dyspnea, cough, haemoptysis and so on before discharge, moreover, the activated myocardium (EAA) and the area of captured myocardium (ECA) were not found through physical examination. No severe complication happened during and after the procedure, and all of them maintained sinus rhythm before discharge. (2) Follow-up: 37 cases were followed-up after 6–12 months, average 6±2 months, only one case lost communication and one case died of congestive heart failure. Five cases occurred: one case with paroxysmal AF who occurred after simple CPVI refused re-ablation, decreased episode frequency and took amiodarone to maintain sinus rhythm. One patient who performed CPVI and atria sinistrum isthmus ablation, three cases with paroxysmal AF appeared atrial arrhythmia after RFCA, but they refused re-ablation temporarily because of decreasing episode frequency. 36 cases took warfarin according to monitoring INR periodically, while one case took warfarin only 2 months after ablation because of hemorrhinia. Dyspnea, cough related to pulmonary vein stenosis, and thromboembolism complications didn’t occur for all of the cases. The LAD of 29 cases recovered already, the effects were poor. CPVI was performed in the all of them (five cases occurred, 13.51%). The endpoint of the ablation was complete electronic isolation of all the pulmonary veins (PVs). The patients who were converted to sinus rhythm in the cause of ablation were validated by Lasso electrodes, and could not be evoked atrial arrhythmia again. However, those who failed to be converted to sinus rhythm would be validated after electroversion for those who weren’t isolated PVs completely; the conducted gap was initially posited by the mapping catheter, and the earliest fragmented potential was targeted for ablation till the complete electronic isolation of all the PVs.

**Conclusions** Catheter ablation is safe and effective for treating AF. **GW23-e2387** IDIOPATHIC RIGHT VENTRICULAR TACHycARDIA AND PREMATURE VENTRICULAR CONTRACTIONS: ABLATION STRATEGY AND A FURTHER LOOK INTO PACE MAPS GUIDED BY NON-CONTACT MAPPING doi:10.1136/heartjnl-2012-302920m.9

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**Objectives** The spatial resolution between activation and pace mapping for idiopathic ventricular arrhythmia is still controversial. In this study, we further analysed pacemap spatial resolution and compare it to non-contact activation mapping.

**Methods** The earliest activation from unipolar based non-contact mapping can be classified as the earliest activation (EA) and the breakout (BO) sites. A total of 124 patients (mean age was 43.65 ±12.74 years old) with 124 VT/PVCs, 36 male, were included in this study. A standard pace mapping at twice the diastolic threshold was applied at both EA and BO sites and the area of activated myocardium (EAA) and the area of captured myocardium (ECA) were measured based on activation and pace maps respectively. Initial ablation attempt was randomised at either the EA site or the BO site. If initial RF attempt failed, it would be followed by a crossover ablation.

**Results** The overall acute successful rate was 98.39% (122/124 VT/ PVCs). Ablation was succeeded at the BO site in 40 (32.79%) VT/PVCs, and at the EA site in 52 (42.71%) VT/PVCs, p<0.01. Pace score is similar between the EA and BO sites (22.95±1.59 vs 22.68±1.52, p=0.47). The ECA at 1 ms, and 5 ms was bigger than the corresponding EAA at the EA site (4.58±3.97 cm² vs 0.03±0.13 cm², 5.44±2.63 cm² vs 0.95±1.41 cm², p<0.01, respectively). Similarly, the ECA at 1 ms, and 5 ms was bigger than the corresponding EAA at the BO site (5.69±5.17 cm² vs 0.75±0.50cm², 10.89±5.08 cm² vs 8.51±4.97 cm², p<0.05, respectively).

**Conclusions** Activation mapping provides better spatial resolution than pace mapping for identifying the origin of RVOT VT/PVCs.

**Pacing and cardiac electrophysiology**

**GW23-e1417** ANALYSIS OF THE COMPLICATIONS IN 296 PATIENTS WITH PERMANENT PACEMAKER IMPLANTATION doi:10.1136/heartjnl-2012-302920n.1

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**Objectives** To analyse of the complications caused by permanent pacemaker implantation.

**Methods** The number of all patients receiving a permanent pacemaker in the inclusive period January 1995 to July 2011 were 297 in our hospital. These patients with an age range of 31–85 years (The mean age of patients was 60±10.5 years.) were paced. Of these 205 were males (age range 52–95 years). Of these 91 were women. In 287 brady arrhythmias (bradyarrhythmia) patients, there were 174 patients with sick sinus syndrome (sinus bradycardia, sinus pause, sinoatrial block, bradycardia-tachycardia syndrome), 108 patients with Atrioventricular block (complete heart block, Mobitz type 2 block), 15 patients with three branch block and 71 patients with binodal disease. There were 10 patients with heart failure for Dilated cardiomyopathy; three patients with vessel pneumogastric syncope, one patients with Carotid sinus syndrome and one patients with long Q-T syndrome. The method of permanent pacemaker implantation followed WANG-fangzheng introduction. Electrode values request: atrial pacing threshold low 1.0 V, P
wave amplitude high 2.5 mV ventricular pacing threshold low 1.0 V, R wave amplitude high 2.5 mV. The range of impedance is 300–1000 Ω. VVI pacemakers were implanted in 173 patients, AAI pacemakers were implanted in 28 patients, DDD pacemakers were implanted in 81 patients, DDDR pacemakers were implanted in two patients, CRT pacemakers were implanted in two patients.

**Results** All operations of implanting permanent pacemaker succeeded and the bradycardia symptom of all patients disappeared. In this study, pacing threshold is 0.2–1.3 V (the mean was 0.45±0.10 V). The impedance was 350–1280 Ω (the mean was 690±103 Ω). P wave amplitude was 3.9–8.5 mV (the mean was 5.0±3.0 mV), R wave amplitude was 5.6±14.5 mV (the mean was 8.5±3.6 mV). There were four patients with haematoma of the pocket of pacemaker. By the treatment of pumping, squeezing and treading with sandbag, the haematoma disappeared. The Skin incision of one patient did not heal after 1 month due to a suture. After the suture was taken out, the Skin incision healed and did not find infection of the pocket of pacemaker. There was one patient with prolapse of the pocket of pacemaker, one patients with long-dated diabrosis. Adams-Stokes syndrome occurred in one patient’s operation, the patient highly depended on pacemaker. Electrocardiograph recorded sinus pause when the patient occurred twitched. After Cardiopulmonary resuscitation, heartbeat of the patient returned. Pacemaker syndrome occurred in two patients with VVI pacemaker. The related symptom disappeared after turning pacing frequency to 50 hpm. Electrode of in one patient’s heart right ear dislocated and Back to normal by banning activities of the sufferer. Pacing threshold in one patient increased, the related symptom disappeared after adjusting output voltage. Muscles in left breast area of one patient jumped, the related symptom disappeared after adjusting output voltage. One patient happened sudden death when working due to unexplained reason. There were no reported incidences of haemothorax, pneumothorax, Arteriogenous fistula, infection of the pocket of pacemaker, electrode fracture, Electrode shift and death in this study.

**Conclusions** Skilled operation method can obviously reduced incidences of complications of permanent pacemaker. Permanent pacemaker insertion can be effective and safe, and the rate of complications was low.

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**LEFT HEART ATRIAL AND VENTRICULAR EPICARDIAL PACING THROUGH A LEFT LATERAL THORACOTOMY TO TREAT PAEDIATRIC COMPLETE ATROVENTRICULAR BLOCK**

doi:10.1136/heartjnl-2012-302920n.2

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**Objectives** To investigate the feasibility, advantages and results of using Left heart atrial and ventricular epicardial pacing to treat paediatric complete atrioventricular block.

**Methods** Eight children diagnosed as complete atrioventricular block (CAVB) ineffective treated by drugs received implantation of left heart atrial and ventricular epicardial pacemakers. Temporal or permanent right ventricular pacing were used for all of them before implantation of left heart atrial and ventricular epicardial pacemaker. Pacemaker syndrome appeared in two of them using permanent right ventricular or right atrioventricular pacing, with EF18–25%. Heart failure appeared in one child diagnosed as acute severe myocarditis, whose EF was 47%, she firstly received temporary right ventricular pacing. Left lateral thoracotomy was performed under general anaesthesia at 4th intercostal space, two pacing leads were individually located at left atrial appendage and left ventricular lateral wall. After all the parameters were detected to be satisfactory, a pouch was made at left abdomen under coastal margin. Dual chamber pacemaker was connected with pacing leads through subcutaneous tunnels. Determine left ventricular diastolic diameters (LVDd) and EF before and after implantation of left heart atrial and ventricular epicardial pacemakers, and also during follow up. To summarise the acute and late parameters and working status for pacemaker and PR interval, QTc of electrocardiogram before and after implantation.

**Results** (1) Left heart atrial and ventricular epicardial pacemakers were successfully implanted in all of these patients with no complications associated with surgical procedure. (2) EF of two patients with pacemaker syndrome were prominently improved after implantation (18–25% to 40–54%) and LVDd were significantly decreased (52–55 mm to 46–47 mm). EF increased from 47% to 65% 2 days after implantation for the child diagnosed as acute severe myocarditis with heart failure. (3) acute parameters: threshold for left atrium: 2.2±0.6 V, decreasing to 1.03±0.27 V (p<0.05) 1 month after implantation; threshold for left ventricular:1.3±0.4 V, decreasing to0.65±0.13 V (p<0.05) 1 month after implantation. (4) QRS interval decreased from180±38 ms to 140±24 ms after implantation (p<0.05); (5) AV interval was set at 90 ms, PR interval 124±4 ms.

**Conclusions** Implantation of left heart atrial and ventricular epicardial pacemaker should be regarded as first choice for children diagnosed as complete atrioventricular block for whom endocardial pacemaker could not be implanted. It’s advantageous for protecting heart function and avoiding pacemaker syndrome with minimal injury.

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**TREATMENT OF PAEDIATRIC ATRIAL TACHYCARDIA ORIGINATING FROM ATRIAL APPENDAGES BY RADIOFREQUENCY CATHETER ABLATION UNDER THREE DIMENSIONAL ELECTROANATOMIC MAPPING SYSTEM COMBINED WITH APPENDECTOMY**

doi:10.1136/heartjnl-2012-302920n.3

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**Objectives** To evaluate the electrocardiographic characteristics of atrial tachycardia (AT) originating from atrial appendages in children and to investigate the effects of radiofrequency catheter ablation (RFCA) under guidance of CARTO system and appendectomy.

**Methods** Of the 17 children with incessant AT receiving RFCA under CARTO system in our electro cardiac lab, five were diagnosed as AT originating from atrial appendages, age 8±1.46 (3.2–12.8) years. Male:Female 1:4. AT appeared to be incessant in all of these five children, resisting to diverse antiarrhythmic drugs or only minimal effects were gained. Decreased cardiac systolic function were detected in four children (80%) whose left ventricular ejection fraction (LVEF) were 44%–50%. Electroanatomical mapping under CARTO system revealed atrial appendage origin for these five children, RFCA by cooled tip catheter (Navi-Star THERMO COOL) were performed at the location of earliest AT origin. We investigated the P’ wave configurations in electrocardiogram of this AT type and effects of RFCA. Appendectomy was used for patients with AT recurrence after RFCA, and effects of this surgical procedure were evaluated.

**Results** Increased focal automaticity was regarded as electro physiologic mechanism for AT originating from atrial appendages proved by CARTO mapping. Three from right atrial appendage...
(RAA) and two from left atrial appendage (LAA). P wave configuration for AT from RAA: (1) positive P' wave in I and aVL leads; (2) positive P' wave in II, III and aVF leads; (3) negative and double-peak P' wave in V1 lead. P wave configuration for AT from LAA: (1) negative P' wave in I and aVL leads; (2) positive P' wave in II, III and aVF leads (3) positive P' wave in V1 lead (1 case) or bidirectional P' wave with positive tendency (1 case). Immediate success rate for RFCA was 100%, three recurred (60%) during follow-up (5–14 months). Of these, two originated from RAA (2/3, 66.7%) and one from LAA (1/2, 50%). Appendectomies were performed under general anesthesia with beating heart, resections to sinus rhythm were gained at time the appendages were incised. No recurrence was detected during 5–14 months' follow-up.

**Conclusions** (1) The electrocardiographic characteristics of AT originating from atrial appendages in children are unique. (2) RFCA under CARTO mapping system by cooled tip catheter is safe and effective for AT originating from atrial appendages in children. (3) RFCA originating from atrial appendage is reliable, while the assurance of AT origin by CARTO mapping system should be gained preoperatively.

**GW23-e0051** THE OBSERVATION OF MEXILETINE TO TREAT A CHINESE TIMOTHY SYNDROME INFANT WITH MOSAIC INHERITANCE

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**Objectives** Timothy syndrome is a rare LQTS caused by CACNA1C-α mutations G406R (TS1) and G402S (TS2). Management of TS is of challenge and the prognosis is poor. This study aimed to further explore the inherited pattern and mechanism of sodium channel blocker, mexiletine, to improve clinical manifestation in TS.

**Methods** A 2.5-year-old Chinese girl showing a typical TS phenotype was undergone candidate gene screening. Mosaicism analysis was performed using specific primers to amplified the mutated allele for family members. Therapeutic effects of mexiletine and propranolol were evaluated using ECG and Holter monitoring.

**Results** This girl presented with severe bilateral syndactyly, cutaneously syndactyly, patent ovale foramen and delayed language learning. Her baseline ECG showed markedly prolonged QTc (640 ms), intermittent 2:1 AV block (AVB) and macro-T wave alternans (TWA). A few R-on-T extrasystoles occurred during 2:1 AVB caused bradycardia. Candidate gene search identified G406R mutation in CACNA1C-α. G406R was absent in her mother but partly present in her father’s oral mucosa, sperm and white blood cells. Though completely asymptomatic he had mild-moderate QTc prolongation (470–490 ms) and syndactyly. Further analysis demonstrated that the proband’s other paternal family members were also mosaic.

**Conclusions** Mexiletine but not propranolol is highly effective in a Chinese TS1 by shortening QTc, abolishing 2:1 AVB, and mimimising TWA.
(165 IU/l), total bilirubinemia (371.8 μmol/l), direct bilirubin (193.5 μmol/l) and indirect bilirubin (178.3 μmol/l) were concomitantly high. Total serum protein and serum globulin were within usual ranges (61.1 g/l, 35.4 g/l, respectively). In contrast, a severe hypoaalbuminemia was observed (serum albumin, 25.7 g/l). She tested positive for HEV RNA and anti-HEV antibodies. Serological testing for hepatitis A, B, and C, cytomegalovirus, and HIV were negative or showed past immunisation. No autoimmune hepatitis-associated antibodies were found. She was diagnosed with LQTS, torsades de points (TdP), acute viral hepatitis E, hyponatremia, hypoalbuminemia. The patient suffered a cardiac arrest due to TdP requiring resuscitation on the admission day. She had many further non-sustained episodes. She was treated with lidocaine, electrical conversion and was immediately catheterised for temporary transvenous ventricular pacing at the bedside. Sodium Chloride, Magnesium sulphate and potassium were administered. The patient had received compound glycyrrhizin as well as reduced glutathione sodium, methylprednisolone, albumin, and blood plasma at the same time. The pacing rate was set to 90 beats/min and gradually dropped to 70 beats/min when she remained stable 2 days later. Syncpe occurred when the pacemaker was not working due to dislocation at week 4 and at week 8. Transaminase levels and bilirubinemia were slowly normalised at week 9. ECG demonstrated sinus bradycardia with normal T-wave and U-wave and a QT interval of 450 ms (QTc = 411 ms) when the liver function nearly returned to normal. She was offered an ICD which she declined. A permanent AAI pacemaker (STJUDE 2406L) and unipolar endocardial lead (STJUDE 1642T/S2 cm) were implanted surgically at week 10. Pacing rate was set to 90 beats/min. She was discharged from hospital 3 months later and the syncope never occurred during the 6 months follow-up.

Conclusions

2. Discuss: The clinical and electrocardiographic features of LQTS are stereotypic. Abnormal prolongation of the QT interval identifies patients at increased risk for TdP as well as giant, abnormal T–U waves as seen in our patient. In this case, the patient is female, ECG demonstrated sinus bradycardia, and laboratory investigation revealed hyponatremia and abnormal liver function. The patients had no obvious structural heart disease and history of administration of QT prolongation drugs. She was diagnosed with acute viral hepatitis E. The relationship of acute viral hepatitis E and LQTS have not been reported. It remains unclear whether acute hepatitis E virus infection was the cause of QT prolongation, or just a coincidence. In this case, the QT interval shortened but didn’t return to normal after correction of the liver function, so the genetic LQTS is also possible. The further scanning of the gene has an important significance for diagnosis and differential diagnosis. An individual’s response to QT-prolongation upon exposure severe disease depends to a certain extent on genetic disposition controlling intrinsic myocardial properties or signalling pathways. Sustained bradycardia is associated with long-QT syndrome and TdP in human beings. The patients had significant sinus bradycardia. It is reported that TdP is pause-dependent in most of LQTS patients (particularly adult females). The beneficial effects of pacing in high risk LQTS patients probably relate to the prevention of bradycardia and pauses and the shortening of QT interval. Syncpe occurred when the pacemaker was not working due to dislocation in our case. In patients with LQTS, ICD implantation for secondary prevention of SCD is a class I indication. ICDs are thought to be the most effective treatment in the prevention of arrhythmic SCD in LQTS but our patient declined. β-blockers remain first-line treatment for LQTS, however, our patient has contraindication during hospitalisation. In summary, factors predisposing to QT-prolongation and higher risk of TdP include older age, female sex, slow heart rate, electrolyte abnormalities, organic diseases, genetic predisposition and so on. Our awareness and understanding of the mechanisms of LQTS will help to identify patients at risk and reduce their exposure to risk factors.

GW23-e1301 IMPLANTABLE DEFIBRILLATOR LEAD EXTRACTION WITH OPTIMISED STANDARD EXTRACTION TECHNIQUES
doi:10.1136/heartjnl-2012-302920n.7

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Objectives Implantable cardioverter-defibrillator (ICD) leads might not be extracted in especially developing countries because of the high cost and lack of specialised tools. We aimed to evaluate transvenous extraction of ICD leads by optimised standard techniques.

Methods We prospectively analysed clinical characteristics, optimised extraction techniques and feasibility of extraction for 40 patients with ICD leads (53 males, mean age 47.9±16.1 years; 42 ICD leads).

Results Infection was the leading reason for ICD lead extraction. Altogether, 37 dual-coil and four single-coil ICD leads were successfully removed by the transvenous approach, one ICD lead required cardiothoracic surgery. No major complications and death occurred. Complete procedural success was achieved in 38 patients (95%), and the clinical success in 39 patients (97.5%). Locking styles were used in 34 leads (81.0%). Twenty leads (47.6%) required mechanical dilatation to free fibrictic adhesions; these leads had been implanted longer than other leads (43.7±18.2 vs 18.4±13.4 months, p<0.05). In all, 30 leads (71.4%) were extracted with locking styles plus manual traction (12, 22.6%) or mechanical dilatation with counter-traction (18, 42.8%) by the superior transvenous approach. Another 11 leads (26.2%) were removed by optimised snares techniques with the femoral vein approach. Median extraction time was 20 min (range 2–68 min) per lead and was correlated with implant duration (r=0.70, p<0.001). Median follow-up was 14.5 months (range 1–58 months), and three patients died due to sudden cardiac death, heart failure and traffic accident.

Conclusions Our optimised procedure for transvenous extraction of ICD leads was practical in use of standard procedures and therefore low cost.

GW23-e2546 SHORT-TERM EFFECTS OF FISH OIL SUPPLEMENTATION ON HEART RATE VARIABILITY IN HUMANS: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS
doi:10.1136/heartjnl-2012-302920n.8

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Objectives Effects of fish oil on heart rate variability, an index of autonomic function in humans, remain controversial. We performed a meta-analysis to investigate the influence of fish oil on parameters of heart rate variability.

Methods Human intervention studies were identified by systematic search of Medline, Embase, Cochrane’s library and references of related reviews and studies through March 2012. Random-effect
model was applied to estimate the pooled results. Prespecified sub-
group analyses were performed to explore the influence of study
characteristics on the overall outcomes.

Results A total of 17 studies were reviewed. Meta-analysis results
showed that SD of normal-to-normal interval (SMD=0.10, 95% CI
−0.11 to 0.30, p=0.35) and root mean square of successive differ-
ces (SMD=0.05, 95% CI −0.18 to 0.27, p=0.35), two of the
the time domain parameters of heart rate variability, were not signifi-
cantly influenced by fish oil supplementation. For frequency
domain parameters, by fish oil supplementation, the high-fre-
cuency power, a surrogate of vagal function, was significantly
increased (SMD=0.34, 95% CI 0.10 to 0.58, p=0.005), the low-fre-
cuency power was not significantly affected (SMD=0.00, 95% CI
−0.24 to 0.24, p=0.99), and the ratio between the low and high-
frequency power showed a trend of reduction (SMD=−0.22, 95% 
CI −0.47 to 0.05, p=0.08). Subgroup analyses according to prede-
fined study characteristics, such as mean age, gender and healthy
status of the participants, total dose and ratio between EPA and
DHA, follow-up duration, b-blocker usage and Jadad scores, retrieved no significant results.

Conclusions Short-term fish oil supplementation may favourably
influence the frequency domain parameters of heart rate variability,
indicating enhancement of vagal tone may be an important mech-
anism underlying the antiarrhythmic effect of fish oil. Large scale
clinical trials with adequate statistical power are needed to confirm
these effects and their clinical relevance in the future.

GW23-e0398 MIDAZOLAM MAY HAVE THE CARDIOVERSION EFFECTIVENESS IN SOME PATIENTS WHO UNDERWENT EXTENSIVE ABLATION FOR PERSISTENT ATRIAL FIBRILLATION
doi:10.1136/heartjnl-2012-302920n.9

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Objectives This study described and analysed the termination of 
persistent atrial fibrillation (AF) by an intravenous bolus of
common dosage midazolam in patients who underwent extensive
catheter ablation.

Methods Radiofrequency catheter ablation was performed in 210
consecutive persistent AF patients (156 males, mean age 58.1
±10.5 years), who under sedation with a bolus of midazolam and
analgesia with a continuous infusion of fentanyl. An intravenous
bolus of midazolam was used for inducing sedation for electrical
cardioversion in patients whose atrial arrhythmias were not termi-
nated by ablation.

Results After extensive ablation, inducing sedation for electrical
cardioversion was attempted in 99 patients (47.1%, 74 males,
meanage 57.9±10.3 years). Termination of atrial arrhythmias and
restoration of sinus rhythm were observed in five patients (5.1%,
all male, mean age 53.0±9.9 years old), 16±4.2 s after the admin-
istration of midazolam (1–2 mg) without antiarrhythmics or elec-
trical cardioversion. Two patients encountered the recurrence of
atrial flutter (AFL), and one of them had a second ablation. During
32.8±16.7 months post the last procedure, 4 (30%) patients were
free of arrhythmias without the use of antiarrhythmics and one
patient remained in drug-refractory persistent AFL.

Conclusions In patients who underwent extensive ablation for
persistent AF an intravenousbolus of common dosage midazolam may
have the cardioversion effectiveness.
CI 1.021 to 1.221), RAD (p=0.043, OR=1.174, 95% CI 1.005 to 1.371), LVEF (p=0.003, OR=0.894, 95% CI 0.817 to 0.996) are related to the occurrence of AF after pacemaker implantation, while the multivariate logistic regression analysis showed that only the LVEF is related to the occurrence of AF after pacemaker implantation (p=0.041, OR=0.900,95% CI 0.813 to 0.996).

**Conclusions** Compared with other middle-term studies (follow-up 1–3 years) that suggesting VVI mode tending to AF, our long-term follow-up data reveal that the impaired LVEF is a predictor for postimplantation AF.

**GW23-e0957 CLINICAL APPLICATION OF EMERGENCY BEDSIDE TEMPORARY CARDIAC PACING WITHOUT X-RAY FLUOROSCOPY**

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**Objectives** To investigate the clinical value and safety of emergency bedside temporary cardiac pacing without X-ray fluoroscopy.

**Methods** 65 patients were selected due to ventricular rate less than or equal to 40 times/min and (or) RR interval greater than 3.0 s caused by various diseases and associated with severe hemodynamic disorders, Adams syndrome attack or disturbance of consciousness. Subclavian vein was punctured for vasodilating sheath placement by seldinger technique without x-ray fluoroscopy at bedside. Temporary pacing electrode was inserted into the right ventricular cavity from the sheath and success was judged by three methods based on intracardiac ECG, pacing ECG, or whether it could induce PVCs.

**Results** Out of 65 patients, 59 cases of pacing was successful and the success rate was 93.7%. The operation time from the puncture to the successful pacing was about 2–15 min (average 4.5 min) and pacing thresholds were less than or equal to 2.0 V. The hemodynamic significantly improved, Adams syndrome attacks stopped and consciousness returned to normal in successful pacing patients. No serious complications occurred such as infective endocarditis, bleeding, pneumothorax, hemothorax and so on.

**Conclusions** Emergency bedside temporary cardiac pacing without x-ray fluoroscopy is important rescue of severe bradycardia or cardiac arrest, particularly suitable for critically ill patients, who should not be moved and need emergency pacing. It has fast, easy and safe advantages and is indispensable means in the cardiac emergency work.

**GW23-e2272 SICK SINUS SYNDROME RELATED WITH GASTRIC CANCER: ONE CASE REPORT**

doi:10.1136/heartjnl-2012-302920n.14

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**Objectives** We report a 58-year-old male who was admitted due to gastric antrum adenocarcinoma diagnosed by gastroscopy and pathology. He had no heart disease and syncope in his past medical history. Cardiac structure and function is also normal confirmed by echocardiography. 24-h ambulatory ECG examinations showed the average heart rate was 51 beats/min, the fastest heart rate was 62 beats/min, and the slowest was 35 beats/min. Atropine test was positive (the fastest heart rate was 71 beats/min).

**Methods** Therefore, the patient was diagnosed as sick sinus syndrome and temporary cardiac pacing was administrated during the perioperative to ensure the safety. After surgery of gastric cancer D2 radical resection, we re-examine the 24-h ambulatory ECG, which showed that it was sinus rhythm, mean heart rate was 69 beats/min, the fastest heart rate was 122 beats/min, and the slowest was 55 beats/min.

**Results** Then the temporary pacemaker was removed. The routine ECG showed that he had sinus rhythm and heart rate was 67–85 beats/min in 1 month and 3 month follow-up. Auscultation of heart rate after activity was about 130 beats/min. In this case report, patients with gastric cancer had significant bradycardia before surgery and returned to normal after surgery. Gastric cancer may be stimulated vagus nerve and cause bradycardia.

**Conclusions** Upon inquiry, there is no report found that the correlation of gastric cancer and bradycardia and it is easy to be misdiagnosis. We analysis that there is a lot of the vagus nerve in the abdominal organs, and organ lesions can lead to stimulation of vagus nerve. The spinal nerve T4–6 common dominates the heart, the stomach and duodenum. Abdominal organ disease accompanies with sinus bradycardia should be suspected vagus nerve reflex. If condition may be given temporary pacing to pass the critical stage, even if they have symptoms of bradycardia, permanent pacing should be suspended implanted in order to avoid unnecessary waste of medical resources, to bring patients with additional injury, the risk of accidents, and psychological and economic burden.

**GW23-e2288 EFFECT OF VAGAL NERVE ON THE MONOPHASIC ACTION POTENTIAL OF VENTRICULAR OUTFLOW TRACT**

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**Objectives** Vagal nerve may be related with idiopathic ventricular tachycardia (IVT). The present study was aimed to investigate the effect of vagal nerve on the monophasic action potential (MAP) of ventricular outflow tract.

**Methods** Eight adult mongrel dogs were involved. Bilateral vagosympathetic trunks were decentralised for stimulation. Metoprolol was given to block sympathetic effects. MAP was recorded at the LVOT, RVOT, RVA with or without vagal stimulation (VS) respectively.

**Results** 90% of MAP duration (MAPD90) under VS was significantly shorter than baseline (p<0.05). With or without VS, the MAPD90 of RVA were significantly shorter than RVOT and LVOT (p<0.05), while there was no difference of MAPD90 between RVOT and LVOT. With VS, the abbreviation of MAPD90 at LVOT and RVOT was greater significantly than RVA (MAPD90: 12.1±3.9 at RVOT, 14.8±5.5 at LVOT vs 8.3±4.1 at RVA, p<0.05), while there was no difference of MAPD between LVOT and RVOT (p>0.05).

**Conclusions** VS could reduce MAPD significantly. With VS, the abbreviation of MAPD90 at LVOT and RVOT was greater significantly than RVA. It suggested that outflow tract may be sensitive to vagal modulation, which might be related to the occurrence of VT.
Objectives To discuss the significance of HRV in hypertension and type 2 diabetes.

Methods In 45 elderly hypertension patients (A group) and 32 elderly patients with hypertension and type 2 diabetes mellitus and 55 healthy elderly persons (controlled group), 24 h electrocardiogram were recorded and analysed.

Results In the elderly patients (A group), the SDNN, SDANN, SDNN-index, rMSSD, PNN50 were 122.07±20.01 ms, 105.49±18.63 ms, 44.52±13.76 ms, 23.97±6.38 ms, 6.71±3.67% respectively. In the B group, the SDNN, SDANN, SDNN-index, rMSSD, PNN50 were 98.35±21.01 ms, 81.72±17.89 ms, 33.91±10.98 ms, 19.04±6.01 ms, 3.15±2.21% respectively. In controlled group, the SDNN, SDANN, SDNN-index, rMSSD, PNN50 were 152.46±19.23 ms, 129.58±20.03 ms, 57.51±16.79 ms, 37.13±13.78 ms, 13.13±11.01% respectively. The results showed that SDNN, SDANN, SDNN-index, rMSSD, PNN50 in patients with hypertension and hypertension with type 2 diabetes mellitus were much lower than those in the normal control group, especially in the hypertension with type 2 diabetes mellitus (p<0.05).

Conclusions The elderly patients with hypertension and type 2 diabetes mellitus tend to have more ventricular arrhythmias, ischaemic ST segment depression and less HRV.
Conclusions There was a significant torsion between the ipsilateral PVs, which should be taken into account when physicians plan their ablation to avoid a single-plane circumferential ablation.

GW23-e0399 PULMONARY VEIN SPONTANEOUS ACTIVITIES: INFLUENCE FACTORS AND IMPACT ON PULMONARY VEIN RECONNECTION
doi:10.1136/heartjnl-2012-302920n.19

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Objectives In this study, we sought to evaluate the influence factors of pulmonary vein (PV) spontaneous activities (SAs) and the impact of SAs on the PV reconnection (PVR) in atrial fibrillation (AF) patients.

Methods Circumferential PV isolation as a first ablation procedure was performed in 689 consecutive patients with AF (460 males, mean age 58.9±10.5 years).

Results The acute PV isolation was achieved in 680 (98.7%) patients. A total of 342 ipsilateral PVs (25.1%, 342/1360) with SAs were documented in 295 patients (43.3%, 295/680). Patients were classified as SAs Group and Control Group. Univariate analysis revealed that gender (p=0.002), type of AF (p=0.006), rheumatic heart disease (p=0.002) and a history of cardiac surgery (p=0.008) had significant difference between the two groups. The multivariate analysis revealed that male (Exp [B]1.717, 95% CI 1.216 to 2.425, p=0.002) and paroxysmal AF (Exp [B] 1.595, 95% CI 1.145 to 2.221, p=0.006) were independently associated with the presence of SAs. The incidence of acute and intraoperative PVR of SAs Group was higher than that of Control Group (27.0% vs 19.0%, p=0.026, 38.6% vs 29.9%, p=0.042).

Conclusions The male and paroxysmal AF were the two independently influence factors of SAs in patients under went circumferential PV isolation. The SAs had significant impact on the acute and intraoperative PVR during AF ablation.

GW23-e0960 CLINICAL CHARACTERISTICS OF 208 CASES OF CORONARY ANGIOGRAPHY IN ELDERLY PATIENTS WITH CORONARY ARTERY DISEASE
doi:10.1136/heartjnl-2012-302920n.20

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Objectives To explore clinical features of coronary angiography (CAG) in elderly patients with coronary artery disease.

Methods Selective CAG was performed by Judkins method. Coronary heart disease was defined as at least a subepicardial vascular diameter stenosis greater than or equal to 50% (visual method). Coronary arteries were divided into three main branches, namely left anterior descending artery, left circumflex artery and right coronary and the left main coronary artery lesion was treated as two lesions. Lesion sub-type was divided into A, B and C. Type A lesions were less than or equal to 10 mm in length, with localised lesions and no calcification; type B lesions were 10–20 mm in length and moderate calcification; type C lesions were greater than or equal to 20 mm in lesion, diffuse stenosis or severe calcification.

Results Multi-vessel lesions of the older group (149/208) were significantly higher than in the young group (74/176), while single vessel lesions (59/208) were significantly lower than in the young group (102/176) (p<0.01). Type B and C lesions in older group (180/208) were significantly higher than in the young group (82/176) (p<0.01), while type A lesions (28/208) were significantly lower than in the young group (94/176) (p<0.01). Multivessel lesions and diffuse calcified lesions in elderly patients with coronary artery disease were significantly higher than in young patients.

Conclusions Multivessel lesions and diffuse calcified lesions in elderly patients with coronary artery disease are significantly higher than in young patients, suggesting that elderly patients with coronary artery disease are usually in severe condition and poor prognosis.

GW23-e0834 THE TIME COURSE OF ELECTRICAL REMODELLING, STRUCTURAL REMODELLING, NEURAL REMODELLING AND ENDOTHELIN-1 LEVEL IN ATRIAL FIBRILLATION
doi:10.1136/heartjnl-2012-302920n.21

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Objectives The consistency between electrical remodelling, structural remodelling, neural remodelling and endothelin-1 level in atrial fibrillation (AF) has not been reported. The present study aimed to investigate the time course of atrial electrical remodelling, structure remodelling and neural remodelling as well as endothelin-1 (ET-1) in AF rabbit models induced by rapid atrial pacing, and to explore the possible values of ET-1 in predicting the initiation and development of AF so as to guide the treatment for AF.

Methods Forty adult New Zealand rabbits, rapid atrial pacing (600 bpm) was performed to make paroxysmal AF models. The experimental animals were randomly divided into five groups by pacing time, 0 h group (P0), 4 h group (P4), 8 h group (P8), 12 h group (P12), 24 h group (P24), (n=8). The AF induction rate, AERP rate adaptation of AERF, ventricular ejection fraction (EF), heart rate variability (HRV), plasma ET-1, FDPur and the field potential amorphous of atrial tissues, anti-growth-associated protein-43 (GAP43), anti-cholineacetyl transferase (ChAT), anti-tyrosine hydroxylase (TH) and anti-endothelin-1 (ET-1) antibodies in atrial tissues were measured after pacing 0, 4, 8, 12, 24 h.

Results The success rate of rapid right atrial pacing 24 h in rabbits for building AF model was 95%, 25% rabbit normal heart can be induced to AF. The induction rate at pacing 0, 4, 8, 12, 24 h were 25%, 37.5%, 65%, 75%, 85%, respectively. After pacing 8 h, AERP was significantly shortened, the rate adaptive of AERP was significantly decreased, the Fdpur of atrial tissues was significantly prolonged. The shortening of general AERP was inhomogeneous, but the dispersion of Fpdur was increased. The EF was significantly increased after AF 8 h and atrial pathological changes started at AF 24 h. The mean R-R internal was significantly decreased at pacing 4 h, but increased to the maximum at pacing 24 h. The LF and HF was significantly increased at pacing 12 h and 24 h, respectively. The LF/HF was gradually decreased and significantly decreased at pacing 24 h. After pacing 24 h, the density of GAP43-positive, ChAT-positive and TH-positive in the left and right atrium were higher than the density in 0 h group; Furthermore, after pacing 24 h, the left atrium had significantly higher nerve density of GAP43-positive and ChAT-positive than the right atrium. Plasma ET-1 was significantly increased after pacing 12 h and rise to the maximum after 24 h. There was no significant changes of ET-1 in atrial tissues after pacing, it was significantly increased until pacing 24 h.

Conclusions The atrial electrical remodelling, structural remodelling, neural remodelling occurred uniformly at rapid atrial pacing.
ABSTRACTS

GW23-e0283 MICROVOLT T-WAVE ALTERNANS AS A PREDICTOR OF MORTALITY AND SEVERE ARRYTHMIAS IN PATIENTS WITH CARDIAC DYSFUNCTION

doi:10.1136/heartjnl-2012-302920n.22

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Objectives Our previous study shows that Microvolt T-wave alternans (MTWA) testing has significant value for the prediction of mortality or severe arrhythmic events in a population of individuals with implanted ICDs. Whether MTWA is an accurate predictor of ventricular tachyarrhythmic events in patients without ICDs remains unclear. We conducted a meta-analysis of the predictive value of MTWA testing for mortality and severe arrhythmic events in patients with cardiac dysfunction but without implanted ICDs.

Methods Prospective studies of the predictive value of exercise-induced MTWA published between January 1990 and January 2012 were retrieved. All the patients had cardiac dysfunction but without implanted ICDs. Summary estimates of the predictive value of MTWA were derived with a random-effects model.

Results Data were accumulated from seven studies involving a total of 2953 patients, including 662 positive, 1705 negative, 340 indeterminate, and 246 non-negative (which includes both positive and indeterminate tests) MTWA test results. The risk of mortality or severe arrhythmic events was higher in patients with an abnormal MTWA compared to a negative test (HR=4.51, 95% CI=2.28 to 8.39). Similar results were obtained in primary or secondary prevention patients.

Conclusions This study found that MTWA testing has significant value for the prediction of mortality or severe arrhythmic events in a population of individuals with cardiac dysfunction but without implanted ICDs.

GW23-e2183 APPLIED RESEARCH ON USING GASBAG FLOATING ELECTRODES TO DO

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Objectives To investigate the feasibility, effectiveness and security by using gasbag floating electrodes to do temporary cardiac pacing at bedside.

Methods All of emergency treatment with temporary cardiac pacing and hospitalised patients were randomly divided into two groups, 96 cases were the common electrodes group; 100 cases were the gasbag floating electrodes group. Prospective controlled study, to compare with electrodes placement time, the success rate, complication incidence, and the incidence of loose electrode placement in two groups.

Results Compared with the common electrodes group, electrodes placement time is shorter, has higher success rate, lower complication incidence, and lower incidence of loose electrode placemen in gasbag floating electrodes group.

Conclusions It is feasible, fast, safe and effective to using gasbag floating electrodes to do temporary cardiac pacing at bedside, and should be widely applied.

GW23-e0571 ASSOCIATION OF INDUCED HEART RATE TURBULENCE WITH SEVERITY OF CORONARY ARTERY LESIONS IN CORONARY HEART DISEASE

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Objectives Impaired heart rate turbulence (HRT) denotes abnormalities in cardiac autonomic function. We aimed to assess the correlation between coronary artery lesion and HRT induced by programmed electrical stimulation.

Methods From January 2008 to January 2009, totally 113 patients (65 males and 48 females) who underwent coronary angiography were induced by programmed electrical stimulation and divided into four groups according to the number of coronary artery damage: normal control group (n=28), single vessel damage group (n=56), double vessels damage group (n=26) and many vessels damage group (n=23). The mean age of patients was 60.7±11.3 years (ranged from 45 to 74 years). After completion of coronary angiography, an extrastimulus was delivered from the right ventricular apex after 20 sinus beats with a V-S2 coupling interval decremented by 20 to 30 ms until refractoriness was reached. It was completed respectively for the measurement of heart rate, turbulence onset (TO), turbulence slope (TS) and Gemini’s score of coronary stenosis.

Results No serious complication were found during the programmed electrical stimulation, such as death and malignant ventricular arrhythmias. No significant differences were found in gender, age, blood pressure and heart rate. Compared with control group, TO was significantly higher but TS was significantly lower in coronary heart disease groups (p<0.05 or p<0.01). With the increasing severity of coronary heart disease, TO level was increased but TS level was decreased (p<0.05 or p<0.01). TS was negatively correlated with Gemini’s score (r=-0.245, p=0.009) but TO was positively correlated with it (r=0.288, p=0.002). Balanced the influential factors such as age, gender, blood pressure and heart rate, TO and TS still had significantly correlated with Gemini’s score (p<0.01). Multiple regression analysis showed that Gemini’s score was independent factor to influent TO and TS level.

Conclusions Our data show that it is safe to measure induced HRT after coronary angiography in patients with coronary heart disease. The abnormal parameters of HRT have close relationship with the severity of coronary artery stenosis.

GW23-e1420 RESYNCHRONISATION THERAPY IN PATIENTS WITH CHRONIC HEART FAILURE (10 CASES REPORTED PLUS)

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Objectives To evaluate the clinical effect of cardiac resynchronisation therapy on systolic function in patients with New York Heart Association class III or IV chronic heart failure.

Methods 10 male patients with an average age of 50±9 years who accepted the optimal drug therapy still had heart failure symptoms were selected to accept cardiac resynchronisation therapy. Changes of the QRS duration, LV ejection fraction, LV end-systolic volume index, mitral reflux volume and heart failure symptoms were measured in all patients at baseline, 3 month and 6 month after cardiac
Cardiac resynchronisation therapy is an effective method to treat chronic systolic heart failure, improving the hemodynamics, heart function and clinical symptoms. Cardiac resynchronisation therapy might be an effective and safety treatment for the patients with systolic heart failure who have the indication.

**GW23-e0477**  
**CARDIAC RESYNCHRONISATION THERAPY EFFECTS COMPARE OF THE SURGERY EPICARDIAL LEAD VERSUS CORONARY SINUS LEAD PLACEMENT**  
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**Objectives** Cardiac resynchronisation therapy (CRT) with biventricular pacing has demonstrated cardiac function improvement. Two strategies (coronary sinus vs epicardial) for left ventricular (LV) pacing were compared.

**Methods** 38 patients with ejection fraction <35%, widen QRS (168±19 ms) and heart failure were enrolled. For left ventricular stimulation coronary sinus (CS) leads were placed in 19 pts. In 14 patients epicardial (Epi) leads were implanted with video-assisted thoracoscopic.

**Results** All the Epi-lead cases and 13 cases in CS-lead group received the LV lead implantation at the latest activated site examined by Tissue Doppler Imaging. For the entire series QRS-duration decreased from 168±19 to 128±14 ms (P<0.05) without difference between groups. The Epi-lead group got better left ventricle resynchronisation effect than the coronary sinus lead group. There was no hospital mortality in the entire series. The LV lead implantation procedure time was 53.4±16.3 min for Epi-lead group and 136 ±55.1 min for the CS-lead group (p<0.05). During the follow up there was clinical cardiac function improvement (15/19 in CS-lead group vs 13/14 in Epi-lead group, p>0.05). Threshold of the CS-leads increased significantly compared to Epi-leads (15.7 month control: 2.3±1.6 vs 1.02±0.4 V/0.5 ms), which had no increase (p<0.05). One case died in the CS-lead group and none died in the Epi-lead group during the follow up. One patient in Epi-lead group and two cases in CS-lead group re-admitted because of the serious heart failure.

**Conclusions** Surgical Epi-lead placement for the resynchronisation therapy is a safe and reliable technique and should be considered as an equal alternative.

**GW23-e0251**  
**COMPARISON OF AMIODARONE AND LIDOCAINE IN A PROLONGED VENTRICULAR FIBRILLATION CANINE MODEL**  
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**Objectives** Ventricular fibrillation (VF) is one of the most common reasons for sudden cardiac death. Many events may prevent paramedics from timely arrival to treat cardiac events. In the USA, more than 400 000 adult deaths each year are due to sudden cardiac death, and 80% of all the sudden cardiac arrest cases are associated with VF. In China, more than 540 000 adult deaths are due to sudden cardiac death each year. Most patients experiencing cardiac events have structural heart diseases such as coronary heart disease, myocardiopathy and pericardial disease. The others have congenital cardiac arrhythmia such as Brugada syndrome and long QT syndrome. Implantable cardioverter defibrillator (ICD) is the best treatment for patients at risk, but many people in China cannot afford this treatment. So antiarrhythmic drugs have become the first choice for preventing cardiac arrhythmia, especially VF and may be the first emergency drug used in cardiopulmonary resuscitation in China. Lidocaine is a traditional class IB antiarrhythmic drug for VF and pulseless ventricular tachycardia (VT). Amiodarone, a class III antiarrhythmic agent, has been widely used for cardiac arrhythmia. Many clinical trials have demonstrated that amiodarone may be used to replace lidocaine. The Amiodarone versus Lidocaine in Prehospital Ventricular Fibrillation Evaluation (ALIVE) trial and the Amiodarone in Out-of-Hospital Resuscitation of Refractory Sustained Ventricular Tachyarrhythmia (ARREST) study are two large, randomised trials finding the benefit of amiodarone to treat refractory VF during cardiopulmonary resuscitation (CPR). However, in these trials, the mean time to receive first aid was about 8 min. In the ALIVE trial, the time that patients received the first shock was 8 ±3 min in the amiodarone group and 9±4 min in the lidocaine group. In the ARREST study, the first responder arrived within 4 min, and paramedics arrived and gave patients the first shock within 9 min, though the accurate time from sudden death to receive first aid is difficult determined during prehospital or out-of-hospital investigations. In a Japanese clinical study comparing nifekalant and lidocaine to treat refractory VF, the time to start CPR was about 7 min. In developed countries, the emergency medical system is better and the CPR technique and devices for first aid such as AED are more widespread than in developing countries. So, especially in less-developed countries, if patients experiencing sudden cardiac events cannot receive rescue measures in time, antiarrhythmic agents may have a positive effect on refractory VF. However, which agent is better, amiodarone or lidocaine? Few studies have compared the two drugs.

The purpose of this randomised, experimental canine study was to compare the effect of amiodarone and lidocaine on CPR when given simultaneously with adrenaline in a canine model of prolonged VF.

**Methods** Twenty-one mongrel dogs of both sexes (15.5–19 kg) were used. The dogs were anesthetised with pentobarbital (25 mg/kg intravenous, bolus). Animals were restrained in the supine position at the four extremities on the experimental table. A 5.0 cuffed tracheal tube was inserted into the trachea for intubation. The tube was attached to a ventilator. Ventilation began at a tidal volume of 10–15 ml/kg, a ventilator rate of 16–20 breaths/min, and an inspiration: expiration ratio of 1:1.5–2.0. Three electrocardiographic leads were placed to correspond to standard lead II electrocardiography (ECG). The right femoral artery was cannulated, and the tip of a fluid-filled polyurethane catheter was positioned in the proximal descending aorta for measuring aortic systolic pressure (AOSP) and diastolic pressure (AODP). A second fluid-filled polyurethane catheter was introduced through the right femoral vein into the right atrium (RA) to measure systolic pressure (RASP) and diastolic pressure (RADP). The remaining cannulated femoral vein was used for drug infusion. Heparin, 100 U/kg, was administered for anticoagulation. A continuous infusion of 0.9% NaCl, 3 ml/kg/h, was given throughout the experiment. Heart rate (HR) and QT
interval were measured at baseline and after resuscitation, during stable sinus rate. The corrected QT interval (QTc) was calculated by Bazett’s formula. The catheters were connected to pressure transducers connected directly to a computer for on-line recording of data (Acknowledge, Biopic Systems, Inc, CA, USA). Aortic and right atrial pressures were monitored throughout the study. Coronary perfusion pressure (CPP) was calculated on-line at mid-diastole by subtracting RAPD from AODP. Baseline measurements were made just before the 2 min of compression phase of CPR. After 2 min of compression, a ratio of 2:30 was delivered by a manual bag-valve ventilator. Ventilations were delivered continuously during the decompression phase of CPR. After 2 min of compression, defibrillation with 150 J biphasic was attempted immediately. Animals that were still in VF or pulseless VT after only once defibrillation were randomised to three groups (n=7 for each) for treatment: amiodarone plus adrenaline, lidocaine plus adrenaline or placebo and adrenaline. Adrenaline was given in intravenous boluses of 0.02 mg/kg; amiodarone (Cordarone, amiodarone hydrochloride injection, polysorbate-80, a diluent which on its own is a potent vasodilator and may be also negatively inotropic, was not included), 5 mg/kg; lidocaine, 1.5 mg/kg; and placebo (normal saline) 5 ml. Amiodarone was injected in 2 min. All dogs were followed by a 10-ml saline intravenous bolus to decrease the time for medication to reach the central circulation. Researchers were blinded to the treatment. CPR was not interrupted during drug administration. After the first administration of drugs, canines were given 5 min external thoracic compression (2 min per turn) and one shock with the same energy of defibrillation in every 2 min CPR as necessary. If animals were still VF we gave drugs once more. Animals with successful return of spontaneous circulation (ROSC) were treated with advanced life support and observed for 2 h. Animals without successful ROSC after 30 min of CPR were allowed to die. The study endpoints were ROSC, survival for 2 h under advanced life support, and death.

Results The three groups did not differ in survival rate, hemodynamic measurements after drug administration, or heart rate, PR interval or QRS complex (p=0.074, 0.077 and 0.415, respectively). ROSC did not significantly differ among the groups (p=0.807), with 4, 5, and 3 dogs achieving ROSC in the amiodarone, lidocaine and placebo groups, respectively. Three, 5, and 3 dogs in the amiodarone, lidocaine and placebo groups, respectively, survived for more than 2 h. The survival rate for the three groups was 42.9%, 71.4% and 42.9% respectively, with no significant difference between groups. ECG measurements did not differ between the amiodarone and lidocaine groups, except for QT interval (420.0±192.2 vs 234.0±19.5 ms, p=0.036). One case of atrypical torsades de pointes was found in the amiodarone group. Three, 5, and 3 dogs in the amiodarone, lidocaine and placebo groups, respectively, survived for more than 2 h.

Conclusions In the prolonged VF model, amiodarone and lidocaine had a similar effect on terminating VF hemodynamics and survival rate. Lidocaine may be safer than amiodarone in terminating refractory VF.

Objectives Remodelling of connexins was found accompanying with atrial fibrillation. The aim of the study is to investigate whether it is the remodelling of connexin 43 (Cx43) plays an important role during the initiation and maintenance of atrial fibrillation.

Methods Samples of right atrial appendage were taken from 30 patients with rheumatic valvular disease during surgery. Fibrosis and remodelling of connexin 43 was examined by microscopy technique and analysed by image analyser. The volume fraction of Cx 43 (Cx 43 VF) were studied between atrial fibrillation (AF) and sinus rhythm (SR) groups.

Results Microscopic examination demonstrated that Cx43VF significantly decreased in patients with AF compared to those with SR.

Conclusions It has been established that gap junctions between cells are of great importance for electrical conduction in human heart. Each junction allows small, water soluble molecules to move directly between the cytoplasm of the two cells in contact, which means that both cells share metabolites and even electrical properties. Gap junction between cardiocytes provides the normal pathway for electrical conduction, and accordingly, assures action potential to propagate uniformly. In cardiac tissue, connexin40, connexin43 and connexin45 which construct gap junctions have been detected; connexin40 and connexin43 are the main components of gap junction in the atrium. It is shown that depletion of Cx43 in mice atrial myocardium was accompanied with changes in atrial electrical coupling and enhancement of susceptibility for arrhythmia. Atrial fibrillation is a kind of electricity turmoil in the atrial myocardium. Many studies have demonstrated redistribution and remodelling of connexins in patients with atrial fibrillation. Gap junction distribution becomes progressively more polarised with increasing age in canine atrial muscles and localised to the cell termini. In this experiment, abnormal distribution of Cx43 in the human right atrial appendage was detected. The Cx43VF in patients with AF was significantly lower in comparison with the SR group; the result was similar with the study done by Kostin S et al. The change may improve the anisotropy of the impulse conduction through atrium and result in severe heterogeneity, thus to initiate and maintain atrial fibrillation.

Heart failure

Objectives Aims: During the 2005 American Heart Association (AHA) Consensus Conference, compression first versus defibrillation first for sudden cardiac arrest with ventricular fibrillation (VF) had drawn much interest. Some data challenged the standard
practice of providing defibrillation first, especially when 4–5 min or longer had elapsed between collapse and rescuer intervention. To allow rescuers the option of providing CPR first, particularly for out-of-hospital cardiac arrest when the response interval is estimated to be longer than 4–5 min, 1.5–3 min of CPR before defibrillation attempt could be considered for the purpose that heart can respond more favourably to a defibrillation attempt. However, the ideal duration of CPR before attempted defibrillation hasn’t determined because of lacking sufficient data. Investigators had drawn conflicting conclusions on the durations of CPR before offering first defibrillation attempt. In this study, we aimed to compare strategies of 2- with 4-min CPR before defibrillation in a canine model of 12-min VF to evaluate efficacy on hemodynamic parameters and survival outcomes, then determine the optimal CPR duration prior to the first defibrillation attempt for prolong VF.

**Methods** Twenty adult mongrel dogs (12–18 kg) of either sex were bred more than 1 week by the anaesthetiologist, so that when anaesthetised, they would not be anxious. All animals were then fasted overnight, but had free access to water. Anaesthetised were induced with 3% sodium pentobarbital (50 mg/kg IV). The degree of anaesthesia was assessed by respiration rate, pulse rate and animal movement, and additional sodium pentobarbital was administered as necessary. The anaesthesia was used in all surgical interventions and unnecessary suffering was avoided. After anaesthetisation, animals were placed in a supine position and incubated with a 5.5–6.0 cuffed endotracheal tube via direct laryngoscope. Dogs were mechanically ventilated to maintain normocapnia by use of a ventilator (Newport E-100M, Newport Medical Instruments, Costa Mesa, California, USA). Ventilation was begun at a tidal volume of 10–15 ml/kg, a ventilatory rate of 16–20 breaths/min and a ratio of inspiration to expiration of 1.1:5–2:0. Three surface electrodes configured to correspond to standard-lead II electrocardiography (ECG) were placed on shaven areas of the thorax and limbs. Continuous ECG was attained by use of an automated external biphasic waveform defibrillator (M4735, Philips, Eindhoven, Netherlands) and a multipurpose polygraph (PowerLab/16sp, AD instruments, Sydney, Australia). Two 6-F catheters (Cordis Corp, Miami, Florida, USA) were positioned in the ascending aorta and right atrium through the right femoral artery and vein, and catheter positions were verified by x-ray (CGO-3000, Beijing Wanding Medical Equipment, China). Arterial and venous pressures were monitored continuously by use of the multipurpose polygraph. Both ECM measurements and pressures were acquired digitally at a sampling rate of 1000 points/sec with use of commercially available polygraphy (Chart for Windows V5.5, AD Instruments, Castle Hill, Australia). The aortic pressure (AOP) and right atrial pressure (RAP) were recorded at baseline and during CPR, com-AOP and com-RAP as compression pressures while decom-AOP and decom-RAP as decompression pressures. Coronary perfusion pressure (CPP) was calculated as AOP–RAP simultaneously during the decompression phase of CPR. Typically, 10 steady individual compressions within each minute of the initial 4 min of CPR were collected for mean pressure analysis. Every peak AOP was defined as apex of the compression phase and the lowest decompression point as the AOP trough. VF was induced by delivering a 5-sec alternating current at 50 Hz, 80-V externally across the thorax through two subcutaneous needle electrodes and was evaluated as (1) characteristic ECG waveform and (2) AOP <20 mm Hg. Assisted ventilation was discontinued when VF was established, which was untreated and allowed to persist for 12 min before experimental interventions began. After 12-min untreated VE dogs were then randomised to manual CPR for 2 min or 4 min (figure 1). For the 2-min group (N=10), animals received 2 min of standard, closed-chest, manual CPR in the anterior/posterior position, a rate of 100–120 compressions/min demonstrated on the defibrillator and the polygraphy. Chest compressions were synchronised to provide a compression:ventilation ratio of 30:2. Ventilations were delivered by use of a conventional bag-valve technique. The interruptions to deliver rescue breaths were eliminated because the artificial air passage was established. After this first CPR cycle, dogs were quickly assessed for subsequent treatment: (1) if VF persisted, a biphasic 150 J countershock was delivered, followed by another 2 min of CPR without any post-shock rhythm or pulse assessment; (2) another 2 min of CPR begun immediately if ECG showed asystole or pulse-less electromechanical dissociation; (3) 1 mg/kg epinephrine was administered intravenously with AOP <80 mm Hg; (4) if ROSC was achieved (AOP≥80 mm Hg sustained for at least 1 min), advanced life support, as recommended by the 2005 AHA guidelines, was then applied. Resuscitation sequence was restarted immediately until ROSC was achieved or with a 30-min total resuscitation attempt. For the 4-min group (N=10), all interventions were identical except for 4-min CPR initiated immediately after 12-min untreated VE. During 4-min CPR, the first 1 mg epinephrine was administered in the second minute without interrupting CPR. For both groups, 1 mg epinephrine was administered intravenously after each assessment until ROSC was achieved or the 30-min resuscitation attempt was terminated. During the whole process of experiment, animals were given intravenous fluids to restore third-space fluid losses. After successful resuscitation, anaesthesia was maintained, ventilation was reconnected and advanced life support was continued to maintain AO≥80 mm Hg, then animals were monitored for another 2 h. Animals were euthanatised with an IV injection of 10% KCl.

**Results** AOP in the first 3 min were comparable between the two groups, but in the 4th minute of CPR, AOP was prominent higher in the 2-min group than the 4-min group (97.75±46.22 mm Hg vs 60.74±23.45 mm Hg, p=0.04). With comparable RAPs in both groups during the 4 min of CPR, CPP demonstrated a similar change to AOP of which 2-min group also became prominent higher than the 4-min group in the 4th minute of CPR (44.03±27.21 mm Hg vs 10.92±25.28 mm Hg, p=0.01). In 2-min group, a tendency of more elevated AOP during CPR was observed, especially when necessary epinephrine and defibrillation were promptly administered. Similar trend was also shown in CPP. However in the 4-min group, a steady AOP and a consequent CPP were demonstrated. With comparable epinephrine administration and defibrillation attempt in each group, six of ten dogs (60%) in the 2-min group achieved immediate ROSC, five of which survived for 2 h, while one dog failed to respond to resuscitation effort after rhythm restoration for 45 min. In the 4-min group, four of ten dogs (40%) achieved immediate ROSC with three survived for 2 h.

**Conclusions** Conclusion: Increasing the conventional 2 min CPR to 4 min before the first defibrillation attempt for prolonged VF did not improve survival rate in a 12-min canine VF model. As longer compression might compromise resuscitation effectiveness, 2 min of CPR prior to initial defibrillation was recommended.

**GW23-e1617** DAILY-BASED SELF-MANAGEMENT FOR NON-HOSPITALISED HEART FAILURE PATIENTS IMPROVE PROGNOSIS doi:10.1136/heartjnl-2012-302920o.2

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**Objectives** Our study focused on the method of monitoring, and integrated a variety methods of follow-up. We expected to establish a new management model which relies on patients themselves,
that is ‘self-management’. In present study we will evaluate the effectiveness of this model for HF patients in comparison to usual care. And more importantly, we expected to explore the daily indicators related to heart failure prognosis.

**Methods** The study is designed as a two-group randomised controlled trial in which patients are assigned randomly to receive daily-based self-management (intervention group) or to receive usual care (control group). For intervention group patients, they will get self-management training and monitoring, including measure heart rate, blood pressure, weight, judge degree of oedema and dyspnea, and complete 6-min walk test at home. All of these data will be recorded and become an important basis for determining the patient’s treatment. Patients from the control group receive usual care. All patients will be followed—up for 1 year. Left ventricular ejection fraction and BNP at 3rd, 6th and 9th month after enrolled were examined. The main outcome variables are hospital readmissions for heart failure. The secondary outcome variables are cardiac function, quality of life, all-cause hospitalisations, adverse events and days of hospitalisation.

**Results** Finally, 171 patients with heart failure have finished the follow-up, including 84 intervention group patients (Age 66.3 ± 11.3 years) and 87 control group patients (Age 69.9 ± 9.6 years). The baseline characteristics of two groups showed no significant difference (p>0.05). (1) The daily-based self-management significantly reduced the heart failure hospitalisation rate (RR=0.41, 95% CI 0.21 to 0.79). Furthermore, in the intervention group patients, all-cause hospitalisation rate, time of hospital stay for heart failure were significantly lower than control patients (36.90% vs 81.71%, 16.72 days vs 24.19 days, all p<0.05). (2) Considering the cardiac function, LVEF showed an improved trend over time, while the LVEF of conventional group patients showed no significant change. At all time points, BNP levels of intervention group were significantly lower than the control group (p<0.05). (5) We use Minnesota Living with Heart Failure Questionnaire (LiHFe) to evaluate the quality of life in patients. The results showed that the average score of the intervention group patients was significantly lower than the conventional group patients (21.11±18.03 vs 34.53 ±14.85, p<0.05). That means the quality of life in intervention group had been improved. (4) We analysed the daily-data which were monitored by patients through Logistic multiple analysis. Finally, the indicators we filtered out as independent risk factors for heart failure hospitalisation were weight change and shortness of breath (p<0.05).

**Conclusions** The daily-based self-management model can reduce hospitalisation rates of patients with heart failure, improve their quality of life, save medical expenses. More importantly, through the accumulation and analysis of routine data, we found the independent risk factor for failure hospitalisation, such as body weight and shortness of breath.

GW23-e1566  CARDIOPROTECTIVE EFFECT OF CONTROLLED RELEASE SPRC TO HEART FAILURE OF RATS AFTER MYOCARDIAL INFARCTION AND ITS POSSIBLE MECHANISM

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**Objectives** Heart failure (HF) is one of the most serious health issues in both developed and developing countries. Hydrogen sulphide is the third significant endogenous gasotransmitter which can promote angiogenesis, inhibit myocardial remodelling and protect myocardial apoptosis. S-Propargyl-cysteine (SPRC), a novel endogenous Hydrogen Sulphide donor, is proved to mediate the formation of Hydrogen sulphide to inhibit myocardial apoptosis and prevent heart failure. In order to produce stable and sustaining Hydrogen sulphide, we modify the dosage form to get controlled release SPRC. In this work, we elucidated the role of controlled release SPRC on ischaemic heart of rats and explored the involved pathways.

**Methods** SD rats were subjected to left coronary artery occlusion. The survival rats were divided into seven groups after 48 h and treated with drugs for 6 weeks. Echocardiography indexes including LVID, LVPW, LVAW, EF FS were determined to investigate the heart function. Angiography was performed to discover the density of vasculature. TTC staining was performed to determine the infarct size. The enzymatic activities of SOD, CAT, CK and GSH were determined by colorimetry. The proteins extracted from myocardial tissues were determined by Western blot.

**Results** The protective effects of controlled release SPRC were confirmed by significant reduction of infarct size and improvement of cardiac function, with more promotion compared with normal SPRC. LVPW F5 and EF were evaluated in controlled release SPRC-treated group, while LVID and LVID decreased. Mechanically, controlled release SPRC was shown to increase protein expression of Bcl-2 and decrease protein expression of Bax, caspase-3 and caspase-9 in peri-infarct area and infarct area when compared to HF rats. Furthermore, Controlled release SPRC induced CSE in both areas, especially in infarct area compared with HF rats. Moreover, Plasmatic concentration of Hydrogen sulphide was significantly higher in controlled release SPRC-treated group. These effects of controlled release SPRC could be abolished by PAG. Controlled release SPRC preserved the level of SOD, CAT, CK and GSH with an increase in plasma. In addition, controlled release SPRC promoted angiogenesis after left coronary artery occlusion, especially in ligation area compared with HF group, with better effects of promotion than normal SPRC.

**Conclusions** (1) All experiment data indicated the controlled release SPRC played a cardioprotective role on chronic heart failure after myocardial infarction, which was confirmed by improved heart function. Decreased myocardial apoptosis and shrunk ventricular remodelling. (2) Endogenous Hydrogen Sulphide was partly involved in the cardioprotective effects of controlled release SPRC. (3) Controlled release SPRC exerted better effects than normal SPRC from all sides.

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**Objectives** Chronic heart failure (CHF) is a progressive clinical syndrome characterized by inability of the heart to adequately pump blood to meet metabolic demands of the body. There is intense interest in the identification of novel biomarkers which could improve the diagnosis of chronic heart failure. The overarching goal of the work discussed here was to apply a high-throughput approach, using 1H-NMR spectroscopy to identify novel plasma biomarkers and metabolic signatures underlying chronic heart failure.

**Methods** Plasma samples from 50 patients with systolic heart failure (EF<40% plus signs and symptoms of failure) and 15 controls were
analysed by nuclear magnetic spectroscopy. Each spectroscopy divided into regions of 0.005 ppm width was integrated. After processing the data, orthogonal partial least square discriminant analysis (OPLS-DA) was performed using SIMCA-P+ software (v11.5, Umetrics, Sweden).

**Results** The score plot of OPLS-DA showed good separation between case and control on the level of metabolites. Several metabolites of chronic heart failure patients were altered, including the increased levels of lactate, creatine, proline, leucine, isoleucine, low-density lipoprotein, very-low-density lipoprotein and the decreased levels of histine, glucose, glutamate, valine as well as high-density lipoprotein. Multiple biochemical changes indicated dyslipidemia, oxidative stress and alteration of energy metabolism in chronic heart failure patients. Some compound could also discriminate between different stages of diseases. These findings revealed potential biological mechanisms underlying chronic heart failure.

**Conclusions** The NMR-based metabolomics approach demonstrates good performance to identify the plasma metabolomic markers and provides new insights into metabolic process related to chronic heart failure.

**GW23-e1353** STUDY THE LEFT VENTRICULAR FUNCTION WITH SPECKLE TRACKING IMAGING IN PATIENTS WITH DILATED CARDIO Myopathy AFTER TREATMENT WITH PHOSPHODIESTERASE INHIBITORS-OLPRINONE
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**Objectives** The aim of this study is to compare the left ventricular systolic and diastolic function with speckle tracking imaging (STI) in patients with chronic congestive heart failure due to primary dilated cardiomyopathy (DCM) and the controls, and the left ventricular function changes in these patients before and after intaking phosphodiesterase inhibitors-olprinone.

**Methods** 80 patients with DCM within 24 h before and after intaking phosphodiesterase inhibitors-olprinone for 5 days and 30 healthy persons were examined using conventional echocardiography. The left atrial anterior-posterior dimension and left ventricular internal diastolic dimension were measured on M-mode echocardiography on parasternal left ventricular long axis view, the left atrial superior-inferior dimension and mediolateral dimension were measured on two-dimensional echocardiography on apical four-chamber view in systole. Left ventricular ejection fraction (LVEF) was calculated by bi-plane Simpson’s method. The peak velocity during early diastole (Ve) and late diastole (Va) of mitral valve were measured through transmittal flow by pulse-waved Doppler, and the ratio Ve/Va was calculated. The peak mitral annulus velocity during early diastole (Ve) and late diastole (Va) of anterior mitral valve were measured by tissue Doppler echocardiography. The ratio Ve/Va/Ve was calculated. Two-dimensional echocardiographic images were recorded from the left ventricular short-axis views at the basal level and apical level of the left ventricle. The left ventricular global peak rotation and rotation rate were measured using QLAB 6.0 workstation. Statistical analysis was used to find the difference between the dilated cardiomyopathy patients and the controls, and patients before and after medication.

**Results** The atrial and ventricular dimensions in patients were bigger than that of the controls; moreover, atrial dimension was decreased significantly after medication than that of the ventricular dimension. The peak rotation, rotation rate and global torsion were decrease significantly in DCM. Left ventricular global torsion inversely correlated with left ventricular and systolic and diastolic volume, and positively with left ventricular ejection fraction. Ratio of Ve/Va was significantly lower in patients than that of the controls.

**Conclusions** Left ventricular systolic torsion, diastolic function in patients with dilated cardiomyopathy were significantly impaired. Short time medication can improve the systolic function. The structural changes in left ventricle was not significant, however, atrial dimension could decrease significantly.
**ABSTRACTS**

**GW23-e2651**

ONE-SHOCK VERSUS CONTINUOUS DEFIBRILLATION IN AN 8-MIN VENTRICULAR FIBRILLATION CANINE MODEL OF CARDIAC ARREST

doi:10.1136/heartjnl-2012-302920o.7

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**Objectives** To investigate the resuscitation effect of a one-shock defibrillation protocol versus conventional continuous defibrillation with treatment variation imposed by active compression-decompression CPR (ACD CPR) or standard CPR (STD CPR).

**Methods and results** Ventricular fibrillation (VF) was induced in anesthetised and ventilated canines. After 8 min of untreated VF canines were randomly assigned to four groups representing all combinations of the one-shock versus continuous defibrillation and two different CPR regimens (ACD CPR, STD CPR). Initial shock(s) were delivered, followed by 120 sec of CPR, and the treatment was repeated until resuscitation was successful or for 15 min. The ratio of compression to ventilation was 30:2. Endpoints were restoration of spontaneous circulation (ROSC), defined as spontaneous systolic arterial pressure >50 mmHg; when epinephrine (0.02 mg/kg) was given intravenously; and resuscitation, defined as maintaining systolic arterial pressure >50 mmHg at the 24-h study endpoint. The one-shock protocol was associated with improved outcome: total resuscitation time was reduced because mean CPR interruption time was reduced from 31% for continuous defibrillation to 19% for the one-shock protocol (p=0.015), and survival was increased from 67% to 100%, respectively (p=0.004). The two CPR methods did not differ in outcomes, but survival was increased to 100% for both methods with the one-shock protocol.

**Results** Ventricular fibrillation (VF) was induced in anesthetised and ventilated canines. After 8 min of untreated VF canines were randomly assigned to four groups representing all combinations of the one-shock versus continuous defibrillation and two different CPR regimens (ACD CPR, STD CPR). Initial shock(s) were delivered, followed by 120 sec of CPR, and the treatment was repeated until resuscitation was successful or for 15 min. The ratio of compression to ventilation was 30:2. Endpoints were restoration of spontaneous circulation (ROSC), defined as spontaneous systolic arterial pressure >50 mm Hg, when epinephrine (0.02 mg/kg) was given intravenously; and resuscitation, defined as maintaining systolic arterial pressure >50 mm Hg at the 24-h study endpoint. The one-shock protocol was associated with improved outcome: total resuscitation time was reduced because mean CPR interruption time was reduced from 31% for continuous defibrillation to 19% for the one-shock protocol (p=0.015), and survival was increased from 67% to 100%, respectively (p=0.004). The two CPR methods did not differ in outcomes, but survival was increased to 100% for both methods with the one-shock protocol.

**Conclusions** The primary results showed that renal sympathetic modification therapy for heart failure patients by saline infusion electrode catheter also had reliable safety and effectiveness. Transcatheter renal sympathetic nervous modification therapy could not only improve the heart function of patients including SMWD and NYHA functional classification, but also decrease the dimensions of atrium and ventricle, and even suppress or reverse myocardial remodelling process of heart failure.

**GW23-e1345**

DETECTION THE LEFT VENTRICULAR FUNCTION IN PATIENTS WITH MYOCARDIAL INFARCTION BEFORE AND AFTER INTAKING PHOSPHODIESTERASE INHIBITORS-OLPRINONE BY SPECKLE TRACKING IMAGING

doi:10.1136/heartjnl-2012-302920o.9

Chen Liping, Xi Lin, Li Yanhu, Zhong Chunwei, Chen Dong, Sun ying.

**Objectives** The aim of this study is to observe the left ventricular global systolic function with speckle tracking imaging (STI) in patients with chronic congestive heart failure after myocardial infarction, and the changes in these patients before and after medication.

**Methods** 26 patients with myocardial infarction and congestive heart failure were included in this study. Within 24 h before and after intaking phosphodiesterase inhibitors-olprinone for 5 days,
conventional echocardiography were performed. Two-dimensional echocardiographic images were recorded from the apical four-chamber view, left ventricular short-axis views at the basal level and apical level of the left ventricle. The global peak systolic longitudinal strain, global peak rotation were assessed by two-dimensional speckle tracking imaging (2D-STI) using QLAB 6.0 workstation on mital tip level, papillary level and apical short axis view of left ventricle, apical four-chamber view. Left ventricular ejection fraction (LVEF) was calculated by bi-plane Simpson’s rule. 30 subjects with clinically indicated but negative percutaneous intervention served as controls. Statistical analysis was used to find the difference between the patients and the controls, and patients before and after medication.

Results: Systolic torsion, systolic longitudinal strain, LVEF increased significantly in patients after medication than those before medication (p<0.05), however, which were still lower significantly than that of in the controls (p<0.01). Systolic torsion and systolic longitudinal strain was lower in cases with LVEF < 40% compared with those who had LVEF > 40% but <50% (p<0.05).

Conclusions: This study demonstrates that in patients with myocardial infarction, the evaluation of left ventricular systolic function can be accurately accomplished by using two-dimensional speckle tracking imaging; global longitudinal strain can be a useful parameter to investigate the treatment.

GW23-e0110  EFFECTS OF FISH OIL SUPPLEMENTATION ON INFLAMMATORY MARKERS IN CHRONIC HEART FAILURE: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

doi:10.1136/heartjnl-2012-302920o.10

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Objectives: Effects of additional fish oil supplementation on systematic inflammation in patients with chronic heart failure (CHF) remain controversial. We performed a meta-analysis to evaluate effects of oral fish oil intake on circulating levels of inflammatory markers in patients with CHF.

Methods: Human intervention studies evaluating fish oil supplementation in CHF patients were identified by systematic search of Medline, Embase, Cochrane’s library and references cited in related reviews and studies through November 2011. Either a fixed-effect model or, in the presence of heterogeneity, a random-effect model was used to estimate the combined effects.

Results: A total of seven trials were reviewed. Meta-analysis results showed circulating levels of tumour necrosis factor α (SMD=−0.62, 95% CI −1.08 to −0.16, p=0.009), interleukin 1 (SMD=−1.24, 95% CI −1.56 to −0.91, p<0.001) and interleukin 6 (SMD=−0.81, 95% CI −1.48 to −0.14, p=0.02) were significantly reduced in fish oil group compared with placebo; however, circulating levels of high sensitivity C reactive protein (SMD=−0.02, 95% CI −0.26 to 0.21, p=0.54), soluble intracellular adhesion molecule 1 (SMD=−0.19, 95% CI −0.97 to 0.58, p=0.63) and vascular cell adhesion molecule 1 (SMD=−0.06, 95% CI −0.53 to 0.21, p=0.65) remained unchanged. Meta-regression and subgroup analysis indicated the differences in dose of fish oil and follow-up duration might influence the effects of fish oil on the inflammatory markers significantly. Greater reduction of these inflammatory markers might be identified in patients taken higher dose of fish oil (over 1000 mg/day) for a longer duration (over 4 months).

Conclusions: Anti-inflammation may be a possible mechanism underlying the potential therapeutic role of fish oil for patients with CHF who were on current optimal medications. These effects seem to be more remarkable in patients who took fish oil in a higher dose and for a longer duration.

GW23-e1487  EFFECT OF N-3 POLYUNSATURATED FATTY ACIDS ON LEFT VENTRICULAR FUNCTION IN PATIENTS WITH CHRONIC HEART FAILURE: A META-ANALYSIS OF RANDOMISED PLACEBO-CONTROLLED TRIALS

doi:10.1136/heartjnl-2012-302920o.12

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Objectives: The objective of this study was to assess the effect of supplementation of n-3 PUFA on left ventricular ejection fraction (LVEF), as a measure of left ventricular systolic function in heart failure patients.

Methods: We performed a meta-analysis of randomised, placebo-controlled trials to evaluate the effect of n-3 PUFA on left ventricular function in patients with CHF. Trials were searched in Pubmed, Embase, the Cochrane library database, reviews and reference lists
of relevant articles. The weighted mean difference (WMD) was imputed for net changes of LVEF by using random effect models. Meta-regression, sub-group analysis and sensitivity analysis were performed to identify the source of heterogeneity.

**Results** Six trials (nine comparisons) were included in present meta-analysis. In an overall pooled estimate, compared with placebo group, n-3 PUFA significantly increased LVEF (WMD: 3.57%; 95% CI 1.57 to 5.41; p<0.0004. Heterogeneity test: I²=94%, p<0.00001). Meta-regression showed that the effect size was not associated with age, gender, dose, duration, proportion of diabetes and atrial fibrillation, New York Heart Association class, baseline LVEF and Jadad score. However, subgroup analysis showed supplementation of n-3 PUFA was more effective with long duration (WMD: 5.06; 95% CI 1.68 to 8.44; p<0.00001) than short duration (WMD: 0.95; 95% CI 0.07 to 1.81; p=0.22) and in more diabetic heart failure patients (WMD: 2.17; 95% CI 1.39 to 2.95; p=0.23) than less ones (WMD: 8.46; 95% CI 5.16 to 22.08; p<0.00001).

**Conclusions** Supplementation of n-3 PUFA may improve left ventricular function in patients with CHF, especially with long duration or in diabetic subjects.

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**ABSTRACTS**

**GW23-e1284** EARLY DETECTION OF LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS BY SPECKLE TRACKING IMAGING

doi:10.1136/heartjnl-2012-302920o.13

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**Objectives** The purpose of the study was to assess subclinical left ventricular longitudinal, circumferential and radial diastolic dysfunction in patients with T2DM or combined with HT by STI.

**Methods** 77 T2DM patients with normal LVEF and without symptomatic heart failure were divided into two groups according to their blood pressure. Patients with T2DM isolated (DM): 39 cases (22 men, 17 women, mean age 49.62±9.35 years), and associated with HT (DH): 38 cases (20 men, 18 women, mean age 51.39±9.19 years). Control group (Normal): 34 healthy individuals (16 men, 18 women, mean age 49.68±10.74 years). All subjects were underwent transthoracic echocardiography. Global early diastolic peak longitudinal strain rate (SrLe) and late diastolic peak longitudinal strain rate (SrLa) were measured by SRI and STI. Multiple comparisons were performed using ANOVA with post hoc Dennett’s or Student-Newman-Keuls test. Statistical significance was inferred for p<0.05.

**Results** Global SrLe derived from SRI were significantly lower in the two patient groups (DM: 1.20±0.30 s; DH: 1.00±0.28 s) than that of control group (1.75±0.46 s) and significant differences were observed between any two groups (p<0.05), and global SrLa derived from STI were significantly lower in the two patient groups (DM: 1.47±0.25 s; DH: 1.31±0.26 s) than that of control group (2.08±0.34 s) and significant differences were observed between any two groups (p<0.05), while SrLa derived from SRI and STI had no significant differences between any two groups. Global SrCe derived from SRI was significantly lower in the two patient groups (DM: 7.83±0.35 s; DH: 5.93±0.30 s) than that of control group (2.10±0.35 s) and significant differences were observed between patient groups and normal group (p<0.05). Global SrRe were only significantly lower in DH group than that of control group (−2.07±0.62 s vs −2.33±0.57 s, p<0.05). SrCa and SrRa had no significant differences between any two groups.

**Conclusions** Left ventricular diastolic longitudinal and circumferential functions were significantly lower in T2DM patients with normal LVEF and without symptomatic heart failure. And the T2DM patients combined with HT had impaired left ventricular diastolic function of longitudinal, circumferential and radial directions, so they had even more severe left ventricular diastolic dysfunction. STI could evaluate subclinical left ventricular diastolic dysfunction in longitudinal, circumferential and radial directions, and early diastolic strain rate in every direction could evaluate left ventricular diastolic function with high sensitivity.

**GW23-e1473** INTERLEUKIN 33 MEDIATES THE INTESTINAL INFLUENCE ON THE HEART FUNCTION IN HEART FAILURE MICE-IDENTIFICATION OF GENES IN ILEUM RELATED TO HEART FAILURE USING GENE EXPRESSION PROFILING

doi:10.1136/heartjnl-2012-302920o.14

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**Objectives** Chronic heart failure (CHF) is a condition with a high morbidity and mortality, and accompanied by a range of concomitant disorders organs and systems. These disorders both contribute to the cause of the CHF and have a key role in the progression and response to treatment. However, less is known about the role of gastrointestinal tract in heart failure. We assumed that the changed endocrine function of gastrointestinal tract under heart failure condition might play some influence on the cardiac performance.

**Methods** To verify the assumption, we developed transverse aortic constriction (TAC) model and sham in mice. After 3 months, heart failure was confirmed by echocardiography. We analysed gene expression profiles of ileum and myocardial samples. Among all the genes detected on the microarray, we selected the genes whose expression was significantly different in ileum samples between sham and TAC groups. Subsequently, the functional analysis of these genes was performed and the biological functions most significant to the dataset were identified.

**Results** Based on the established statistical approach, 1467 genes were identified in ileum samples, of which 462 were up-regulated in TAC group. Further refining the screening condition and performing a literature-based search. Gene of interleukin 33 (Il33) was identified with high expression level and strong connection with the regulation of cardiomyopathy.

**Conclusions** In conclusion, the identification of genes that are differentially expressed in ileum of heart failure mice supports the suggestion that microarray analyses may be useful in studying the role of gastrointestinal tract in heart failure. Inflammatory IL33 might mediate the intestinal influence on the heart function in heart failure mice. These results need further investigation and validation.

**GW23-e27652** COMPARISON OF AMIODARONE AND LIDOCAINE IN A PROLONGED VENTRICULAR FIBRILLATION CANINE MODEL

doi:10.1136/heartjnl-2012-302920o.15

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**Objectives** The purpose of this randomised, experimental canine study was to compare the effect of amiodarone and lidocaine on...
CPR when given simultaneously with adrenaline in a canine model of prolonged VF

**Methods** Twenty-one mongrel dogs of both sexes (13.5–19 kg) were used. The dogs were anesthetised with pentobarbital (25 mg/kg intravenous, bolus). Animals were restrained in the supine position at the four extremities on the experimental table. A 5.0 cuffed tracheal tube was inserted into the trachea for intubation. The tube was attached to a ventilator. Ventilation began at a tidal volume of 10–15 mL/kg, a ventilator rate of 16–20 breaths/min, and an inspiration:expiration ratio of 1:1.5–2.0. Three electrocardiographic leads were placed to correspond to standard lead II electrocardiography (ECG). The right femoral artery was cannulated, and the tip of a fluid-filled polyurethane catheter was positioned in the proximal descending aorta for measuring aortic systolic pressure (AOSP) and diastolic pressure (AODP). A second fluid-filled polyurethane catheter was introduced through the right femoral vein into the right atrium (RA) to measure systolic pressure (RASP) and diastolic pressure (RADP). The remaining cannulated femoral vein was used for drug infusion. Heparin, 100 U/kg, was administered for anticoagulation. A continuous infusion of 0.9% NaCl, 3 ml/kg/h, was given throughout the experiment. Heart rate (HR) and QT interval were measured throughout the experiment. Aortic and right atrial pressures were monitored throughout the study. Coronary perfusion pressure (CPP) was calculated on-line at mid-diastole by subtracting RADP from AODP. After baseline measurements, VF was induced by delivering a 5-s alternating current at 50 Hz externally across the thorax through two needles. Assisted ventilation was discontinued immediately on establishment of 12 min VF, dogs were allowed to breathe spontaneously, to simulate the delay that often occurs after out-of-hospital cardiac arrest. After 12 min, external chest compression and ventilation with 100% oxygen was started. The rate of compression was 100/min, and a synchronised ventilation: compression ratio of 2:30 was delivered by a manual bag-valve ventilator (Ambu bag Glostrup Denmark) at a constant tidal volume of approximately 20 mL/kg body weight. Ventilations were delivered during the decompression phase of CPR. After 2 min of compression, defibrillation with 150 J biphasic was attempted immediately. Animals that were still in VF or pulseless VT after only once defibrillation were randomised to three groups (n=7 for each) for treatment: amiodarone plus adrenaline, lidocaine plus adrenaline or placebo and adrenaline. Adrenaline was given in intravenous boluses of 0.02 mg/kg; amiodarone (Cordarone, amiodarone hydrochloride injection, polysorbate-80, a diluent which on its own is a potent vasodilator and may be also negatively inotropic, was not included), 5 mg/kg; lidocaine, 1.5 mg/kg; and placebo (normal saline) 5 mL. Amiodarone was injected in 2 min. All dogs were followed by a 10-mL saline intravenous bolus to decrease the time for medication to reach the central circulation. Researchers were blinded to the treatment. CPR was not interrupted during drug administration. After the first administration of drugs, canines were given 6 min external thoracic compression (2 min per turn) and one shock with the same energy of defibrillation in every 2 min CPR as necessary. If animals were still VF, we gave drugs once more. Animals with successful return of spontaneous circulation (ROSC) (defined as arterial-systolic pressure >50 mm Hg sustained for >1 min continuously within 30 min of CPR) were treated with advanced life support and observed for 2 h. Animals without successful ROSC after 30 min of CPR were allowed to die. The study endpoints were ROSC, survival for 2 h under advanced life support, and death.

**Results** The three groups did not differ in survival rate, hemodynamic measurements after drug administration, or heart rate, PR interval or QRS complex (p=0.074, 0.077 and 0.415, respectively). ROSC did not significantly differ among the groups (p=0.807), with 4, 5, and 3 dogs achieving ROSC in the amiodarone, lidocaine and placebo groups, respectively. Three, 5, and 3 dogs in the amiodarone, lidocaine and placebo groups, respectively, survived for more than 2 h. The survival rate for the three groups was 42.9%, 71.4% and 42.9% respectively, with no significant difference between groups. ECG measurements did not differ between the amiodarone and lidocaine groups, except for QT interval (420.0 ±192.2 vs 234.0±19.5 ms, p=0.036). One case of atypical torsades de pointes was found in the amiodarone group. Three, 5, and 3 dogs in the amiodarone, lidocaine and placebo groups, respectively, survived for more than 2 h.

**Conclusions** In the prolonged VF model, amiodarone and lidocaine had a similar effect on terminating VF, hemodynamics and survival rate. Lidocaine may be safer than amiodarone in terminating refractory VF.
Conclusions For Chinese CHF outpatients undergoing statin treatment had fewer readmissions for adverse events, blunted inflammatory activation and improved left ventricular performance. Statins treatment was equally effective in patients with ischaemic and nonischaemic CHF and may represent an additional option for patients with this disease.

GW23-e1172 THE EXPRESSION AND SIGNIFICANCE OF ADIPONECTIN AND IGF-1 IN PATIENTS WITH CHRONIC HEART FAILURE
doi:10.1136/heartjnl-2012-302920o.17
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Objectives To observe the expression of adiponectin and insulin-like growth factor-1 (IGF-1) and to explore the relationship between the two hormones and the severity and clinic significance in patients with chronic heart failure (CHF).

Methods 77 patients with chronic heart failure were divided into four groups (Grade I, n=19; Grade II, n=13; Grade III, n=22; Grade IV, n=23) according to New York Association functional class (NYHA class) and 19 patients without CHF were used as control group. The concentrations of plasma brain natriuretic peptide (BNP) and serum fasting insulin (FINS) were measured by Microparticle Enzyme Immunoassay (MEIA) and IGF-1 and adiponectin by Enzyme linked Immunosorbent assay (ELISA) and parameters of lipids or glucose metabolism at baseline.

Results Compared with the control group, Levels of adiponectin were significantly increased in the study with CHF ((12.11±5.21) vs (6.62±2.32) ng/l, p<0.01). Serum adiponectin levels were significantly increased according to the severity of NYHA functional class in the patients with CHF; The log-transformed values of serum adiponectin levels correlated positively with the log-transformed values of plasma BNP levels (r=0.459, p<0.001). Serum concentration of IGF-1 were lower in patients with CHF than those in control group (150.2±31.1 vs 94.5±42.7 ng/ml, p<0.001). There were negative correlations between log-transformed values of serum IGF-1 and plasma BNP (R=-0.355, p=0.002). Compared with the group with normal adiponectin level, the CHF patients were significantly associated with serum IGF-1 (74.2±26.7) vs (98.5±42.2) ng/ml, p=0.010. Serum adiponectin was inversely associated with serum IGF-1 (r=-0.335, p=0.003).

Conclusions There were high adiponectin levels and low IGF-1 levels in patients with chronic heart failure. IGF-1 was also negatively associated with adiponectin. The alteration of adiponectin level in different grade of heart failure is very sensitive, and could be an independentrisk marker to evaluate CHF severity. Adiponectin and IGF-1 were contributed to reveal the prognosis of patients with CHF.

GW23-e2287 EXPRESSION OF SERUM CARDIAC ANKYRIN REPEAT PROTEIN IN PATIENTS WITH HEART FAILURE AND ITS CLINICAL SIGNIFICANCE
doi:10.1136/heartjnl-2012-302920o.18
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Objectives To investigate the level differences of cardiac ankyrin repeat protein (CARP) in the blood of patients with heart failure and the correlation among CARP, brain natriuretic peptide (BNP), left ventricular end-diastolic diameter (LVEDD), left atrium diastolic diameter (LADD) and left ventricular ejection fraction (LVEF) in the same patients.

Methods A total of 120 patients with heart failure and 30 healthy individuals between May 2011 and October 2012 in our department of cardiology were enrolled in this study. According to the New York heart (NYHA) classification criteria, the patients with heart failure were divided into four subgroups (the NYHA class I, the NYHA class II, the NYHA class III and the NYHA class IV) 3 ml blood of antecubital vein from patients with heart failure were collected at admission and 3 ml blood of antecubital vein from healthy individuals on an empty stomach in early morning. Added Na2-ethylenediaminetetra-acetic acid to the samples of whole blood, separated plasma by prompt centrifugation of the blood samples at 3000 g at room temperature for 15 min. The samples were immediately frozen and stored at ~20C. ADAMs10,17 and Disintegrin metalloproteinases (ADAMs10,17) expressions in the blood of patients with heart failure (HF) process after myocardial infarction (MI). Disintegrin metalloproteinases (ADAMs10,17) expressions in the blood of patients with heart failure (HF) process after myocardial infarction (MI).

GW23-e2389 EFFECT OF VALSARTAN ON EXTRACELLULAR MATRIX REMODELLING IN RATS WITH HEART FAILURE AFTER MYOCARDIAL INFARCTION
doi:10.1136/heartjnl-2012-302920o.19
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Objectives To investigate the effect of Valsartan on the change of Disintegrin metalloproteinases (ADAMs10,17) expressions in the heart failure (HF) process after myocardial infarction (MI).
**Methods** Based on UCG (LVEF<45%) results, the successfully MI-operated Wistar rats were divided into three groups: HF group, placebo group and Val group, which were given Valsartan by gavage. After 16 weeks, all rats were assessed by hemodynamic evaluation and serum TNF-α from LV was measured by ELISA (R & D, USA). In addition, their left ventricular (LV) muscle samples were extracted from the ischaemic segments, and then the ADAMS 10,17 expression were measured by immunoblotting.

**Results** In this study, heart failure (LVdp/dtmax, LVdp/dtmin and LSVF) was significantly elevated in Val group than the others (p=0.006, p=0.015, p=0.003), and the LVEDP level was decreased (p=0.002). At the same time, the TNF-α level in Val group was lower than HF groups (p=0.023). The ADAM17 and TNF-R1 expressions in Val group was lower compared with those in HF group (p=0.011, p=0.022). However, ADAM10 expression is unchangeable in the four groups.

**Conclusions** Valsartan may reduce the ADAM17 and TNF-R1 expression in the ischaemic zone of myocardium, decrease the TNF-α concentration in LV so as to inhibit cardiac remodelling and improve the heart function after MI.

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**ABSTRACTS**

**RELATIONSHIP OF ARTERIAL STIFFNESS AND LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN CORONARY HEART DISEASE PATIENTS WITHOUT MYOCARDIAL INFARCTION**

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**Objectives** The carotid-femoral pulse wave velocity (cfPWV) has been regarded as a marker of arterial stiffness. The present study was conducted to evaluate the association between cfPWV and left ventricular diastolic dysfunction and its severity in coronary heart disease patients without myocardial infarction.

**Methods** From August 2010 until August 2011, we enrolled 243 patients who are hospitalised for performing coronary angiography. Among these in patients, who with ejection fraction ≤50%, heart failure, organic heart diseases, atrial fibrillation, acute myocardial infarction, peripheral arterial diseases, chronic obstructive pulmonary disease, renal insufficiency (serum creatinine >1.5 mg/dl) were excluded, the other 172 subjects were included. All patients’ medical history and general clinical data were recorded. Blood sampling was performed in the morning after a 12 hour overnight fast. In these patients, we sequentally measured echocardiography, cfPWV carotid intima media thickness and coronary angiography. Left ventricular diastolic dysfunction was divided into four groups according to the results of echocardiography: 38 subjects with normal (Non-HFNEF), 45 subjects with mild dysfunction (Grade I), 57 subjects with moderate dysfunction (Grade II) and 52 subjects with severe dysfunction grade (Grade III). Based on the number of stenotic vessels on coronaryangiography, these patients were divided into three groups: 1-vessel, 2-vessel and 3-vessel groups. Data was analyzed using SPSS 11.5 software.

**Results**

1. The transmission speed of carotid - femoral artery pulse wave, the film thickness of the carotid artery, the inner diameter of left atrium, the thickness of atrial septal basal segment and left ventricular wall as well as the left ventricular diastolic dysfunction index were significantly increased with the exacerbation of diastolic dysfunction between four groups (p<0.001). There were also significant differences in the ultrasound index such as E/A, E/E1 and Tei index that could indirectly reflect left ventricular diastolic function between four groups (p<0.05);

2. There were significant differences in the transmission speed of carotid - femoral artery pulse wave between different groups with coronary heart disease (7.84±0.46 vs 10.25±1.34 vs 14.46±1.68, p<0.001);

3. There were significant differences in the transmission speed of carotid - femoral artery pulse wave to reflect left ventricular diastolic dysfunction was 0.906 (95% CI 0.995 to 1.00). If 5.65 m/s was selected as the cut-off value, the sensitivity and specificity to diagnose left ventricular diastolic dysfunction was 98.3% and 97.2%, respectively.

**Conclusions**

1. Oldage, high blood pressure, diabetes, hyperlipidaemia, smoking and overweight were possible risk factors of diastolic dysfunction in patients with coronary artery disease.

2. The left ventricular diastolic function was declined following the increased severity of affected coronary arteries inpatients with coronary heart disease.

3. The arterial stiffness was increased in patients with coronary heart disease, and correlated with the severity of coronary lesions.

4. The arterial stiffness was correlated with the severity of carotid atherosclerosis and left ventricular diastolic dysfunction in patients with coronary heart disease, which could independently reflect the severity of atherosclerosis and left ventricular diastolic dysfunction.

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**CORRELATION BETWEEN SOCIAL SUPPORT AND ANXIETY AMONG THE PATIENTS WITH MILD HEART FAILURE**

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**Objectives** To investigate the correlation between social support and anxiety among the patients with mild heart failure.

**Methods** 196 patients with mild heart failure were investigated by using Simple Coping mode questionnaire, Self-Rating Anxiety Scale and Social Support Rating Scale, Software Epidata3.0 was used to data entry and check the material, software SAS6.12 was used to analysis the rank correlation.

**Results** Patient’s total score of Self-Rating Anxiety Scale had negative correlation with total score of Social Support Rating Scale, Objective social support, Subjective social support, Utilisation of support in social support respectively (r=-0.123, r=-0.124, r=-0.137, r=-0.112).

**Conclusions** Anxiety correlated with Social Support respectively among the Patients with mild heart failure, enhancing social support among the patient with mild heart failure maybe contribute to their physical and mental health.
GW23-e1422  
**EFFECTS OF BIVENTRICULAR ELECTRIC STIMULATIONS APPLIED DURING ABSOLUTE REFRACTORY PERIOD ON CARDIAC FUNCTION OF RABBITS WITH HEART FAILURE**

doi:10.1136/heartjnl-2012-302920o.22

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**Objectives** To investigate the effects of biventricular electric stimulations during absolute refractory period on cardiac function and ventricular remodeling of rabbits with chronic heart failure, explore the best pattern and the safety of Cardiac Contractility Modulation (CCM).

**Methods** Thirty rabbits were divided into three groups: sham-operated group, LV cardiac contractility modulation (LV-CCM) group, biventricular cardiac contractility modulation (BV-CCM) group. Rabbits models of chronic heart failure were made by ligating ascending aortic root of rabbits. Then electrical stimulations during the absolute refractory period were delivered on the anterior wall of left ventricle in LV-CCM group and on the anterior wall of both left ventricle and right ventricle in BV-CCM group lasting 6 h everyday for 7 days. Changes in ventricular structure, cardiac function and electrocardiography were observed before and after CCM stimulation.

**Results** Compared with sham-operated group, heart weight, heart weight index, LVESD, LVEDD in LV-CCM and BV-CCM group were significantly decreased (p<0.05), while their LVEF and FS were significantly increased (p<0.05), especially in BV-CCM; IVS, LVPM, E wave, A wave and E/A ratio were similar among groups. Plasma BNP levels in three groups was no significant increase (p>0.05); however plasma BNP levels in BV-CCM group were highest among three groups. Holter monitoring showed that regardless whether or not CCM delivered the heart rate have no change in heart rate in LV-CCM and BV-CCM group. Compared with sham-operated group there is no increase in ventricular arrhythmias.

**Conclusions** Biventricular electric currents delivered during the ARP could significantly enhance the contractility of myocardium and improve cardiac function and reverse ventricular remodelling safely.

GW23-e0152  
**TRACHEOTOMY DURING THE CARDIOPULMONARY RESUSCITATION PROCESS**

doi:10.1136/heartjnl-2012-302920o.23

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**Objectives** Tracheotomy is very important in the process of cardiopulmonary resuscitation (CPR), especially the cardiac arrest result form obstruction of respiratory tract. It is advantageous, when tracheotomy is undertaken, that the dyspnoea is relieved and patient get a reliable support of respiration. We had a tracheotomy in the process of persistent CPR and the report of it is presented here.

**Methods** Clinical data: a 18-month-old girl, 5.5 kg, who came to our hospital for the diagnose of congenital heart disease: dextrocardia, ventricular septal defect (VSD) in 5th echocardiogram. In the process of anesthesia before operation at 7th, the tracheal intubation could not get into the trachea which was tried out for three times even though the revelation was clear. A lump could be see below the glottis vera with the help of laryngoscope. A 2F tracheal intubation which is used for preterm infant was inserted then the patient got into the intensive care unit (ICU) immediately. Computer tomography (CT) had been done in emergency, which showed that there is a stenosis at the glottis level and the tracheal diameter is only 2 mm. The patient was cardiac arrest at that afternoon, closed cardiac massage had been done immediately with ventilatory support. Blood gas analysis (BGA) showed: PH:6.8, Po2:31 mm Hg, PCO2:126 mm Hg, K+:3.4 mmol/l, HCO3:12.4 mmol/l, Ca++:0.96 mmol/l, BE:−21.7 mmol/l, Lac:15 mmol/l; the rest indexes were all within normal limits. Tracheotomy had been done in emergency in the process of CPR. Homeostasis had been adjusted according to the results of BGA. Adrenaline, isoprenaline, lidocaine, sodium bicarbonate and insulin with glucose were administrated in the CPR process. We undertaked CPR for about 162 min before the revival of sinus rhythm, and the vital sign showed: heart rate 146/min, blood pressure 68/42 mm Hg, respiratory frequency 22/min, temperature 37.6 °C. BGA showed PH:7.42, PO2:188 mm Hg, PCO2:38 mm Hg, K+:4.9 mmol/l, HCO3:23.5 mmol/l, Ca++:1.28 mmol/l, BE:+2 mmol/l, Lac:3.4 mmol/l. Homeostasis had been achieved on the whole.

**Results** The life of patient is dangerous with serious airway obstruction especially infant. Their airway is so narrow that a lump blocking is lethally for infant. This infant can not speak and airway CT is not routine examination so trachea abnormity was not found preoperation which is a hidden danger. It is another hazardous to leave out ICU for CT examination. Tracheotomy is so dificult that doctors are hesitating to do it which delayed the utility time of therapy. Tracheotomy was performed after the cardiac arrest which was done in the process of CPR, but it was accomplished successfully by the cooperation of our group.

**Conclusions** The incision of trachea is very difficulty in children especially during the CPR process, however the procedure could be smoothly accomplished if some manipulations were improved. There are some gains from this process. First, the airway abnormality should be found preoperation in order to prevent the failure of operation due to airway obstruction. There was a patient whose postoperative CT showed left main bronchus slendered for whole range and that patient dead of respiratory failure. Second, tracheotomy must be done in emergency when tracheal intubation failed confirmly. Better effect would be got if this patient was tracheotomised before cardiac arrest. Third, continued closed cardiac massage makes the exposure of operating field very vaguely due to the floating body of patient and the influencing of other machines or people. Operator must do this operation calmly and naturally so that the complications such as tissue damage, haemorrhage and pneumohyopoderma could be reduced. Fourth, doctors must have a spirit of never to say failure. This would be the last straw for some advanced diseases. Fifth, doctors could rescue patient whole-heartedly if there is a good doctor-patient relationship. An effective communication between doctor and family member of patient is important in the process of CPR and tracheotomy. Last but not the least, a unified command and cooperation is the key point for success.

GW23-e1570  
**RED CELL DISTRIBUTION WIDTH IS BETTER FOR PREDICTING SHORT-TERM AND LONG-TERM OUTCOMES THAN HAEMOGLOBIN IN ACUTE ONSET OF CONGESTIVE HEART FAILURE**

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**Objectives** The goal of this study was to determine the short-term and long-term prognostic value of red cell distribution width
Methods

In a cross-sectional study, patients with acute onset of CHF and admitted to cardiac care unit in Juntendo University Hospital were enrolled from Jan 2007 to Dec 2009 and were followed for a median of 24 months (range 6–42 months). We measured red blood cell distribution width, haemoglobin and other biomarkers when admission. The results were statistically analysed by software JMP 8.0 and SPSS 18.0.

Results

A total of 521 patients were enrolled, with a median (IQR) age of 72 (64, 80) years old (66.6% male). Multivariate analysis showed that Hgb, B-type natriuretic peptide (BNP), estimated glomerular filtration rate (eGFR) and high density lipoprotein cholesterol (HDL-C) were independent predictors of RDW. The mean level of Hgb in in-hospital-dead group was 11.0 ± 1.8 g/dl and 11.8 ± 2.6 g/dl in in-hospital alive group (p>0.05), and the median (IQR) value of RDW was 16.2% (15.1%, 17.6%) and 14.4% (13.5%, 15.8%), respectively (p=0.0001). Through a median of 24 months follow up, the mean level of Hgb in no-end-point-group was 12.5 ± 2.4 g/dl and 11.4 ± 2.5 g/dl in endpoint-group (p<0.0001), and the median (IQR) value of RDW was 13.8% (13.5%, 14.4%) and 14.9% (15.9%, 16.5%), respectively (p=0.0001). Logistic regression analysis showed in-hospital mortality was significantly related with RDW (p=0.044), eGFR (p=0.042) and C response protein (p=0.0044), not with Hgb (p=0.10). In the final multivariate cox proportional hazard models, RDW (per SD increase, HR 2.19, 95% CI 1.92 to 2.50, p<0.0001), left ventricular ejection fraction (per SD increase, HR 0.81, 95% CI 0.71 to 0.92, p=0.0016), age (10 years increase, HR 1.19, 95% CI 1.07 to 1.34, p=0.0017) and NYHA III/IV (HR 1.52, 95% CI 1.15 to 2.05, p=0.0029) remained independent predictors of long-term outcomes after adjustment, while Hgb did not add prediction value (per SD increase, HR 1.01, 95% CI 0.96 to 1.03, p=0.86).

Conclusions

Higher red cell distribution width values at admission in congestive heart failure patients were associated with worse short-term and long-term outcomes, with more prognostic value than haemoglobin. RDW is inexpensive and contained in routine test. It should be included in multi-markers prognostic models to predict short-term and long-term outcomes in patients with acute exacerbation of heart failure.

GW23-e2683

DIRECT RENIN INHIBITOR–ALISKIREN: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS IN CHRONIC HEART FAILURE PATIENTS

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Objectives

To explore whether aliskiren could improve cardiac function and clinical outcomes, then to evaluate the incidence of adverse events in chronic heart failure patients.

Methods

A systematic literature search was conducted to identify randomised controlled trials of aliskiren for chronic heart failure in CNKI, WangFang Data, CMB, PubMed, Cochrane Library, Springerlink, High Wire by independent two author. Reports of trials were sought that compared aliskiren with standard treatment for chronic heart failure in adults. Then according to the Cochrane Handbook for systematic reviews, we estimate the quality of the randomised controlled trials and collect the useful information. At last, we choose the variable and process data with RevMan 5.0.

Results

Six trials with data for 2022 patients were identified by the literature search. Combination with aliskiren therapy was not associated with a significant improvement in left ventricular ejection fraction in chronic heart failure patients, weighted mean difference (WMD) with standard therapy –0.64%, 95% CI from –0.12 to –0.09, p<0.05; but the left ventricular end-systolic volume in intervention group was significantly reduced (WMD –2.63 ml, 95% CI from –5.15 to –0.12, p<0.05). Aliskiren could reduce the plasm BNP concentration compared with standard therapy (WMD –20.78 pg/ml, 95% CI from –36.98 to –4.58, p<0.05). Besides aliskiren do not show a significant protective effect for hospitalisation (RR 0.84, 95%CI from 0.42 to 1.67, p>0.05) and all-cause mortality. Meanwhile, combination with aliskiren may bring more hyperkalemia (RR 1.81, 95% CI from 1.20 to 2.72, p<0.05) and hypotension (RR 1.54, 95%CI from 1.10 to 2.16, p<0.05).

Conclusions

Aliskiren might be a more effective strategy for chronic heart failure treatment. It can bring some cardiac protection, and may lead to more adverse events when combines with standard treatment of heart failure. More studies, especially larger multicentre randomised controlled trials, are warranted to clarify the effect of aliskiren on chronic heart failure.

GW23-e1431

COST AND IMPACT OF SELF-REPORT AND TELEMONITORING ON HEART FAILURE READMISSION: A CASE REPORT

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Objectives

Chronic heart failure is a progressive pathological process with frequent rehospitalisation, low survival rate and high medical cost. Early detection of signs of decompensation events is critical for reducing hospital readmission.

Methods

An 83-year-old man with chronic heart failure presented early signs of decompensation four times since 2010 and were alerted to the HF specialist through the combination of self-report and telemonitoring. The patient’s symptoms were treated in time and hospital readmission was avoided. The cost of the combination in the first year was 230.0 USD, which was 85% of the cost of regular tests (271.0 USD), 30% of the cost of hospital per stay (783.7 USD), and 15% of the cost of the general medications per year (2351.0 USD). From the second year, the cost of the combination (89.9 USD) declined to 33% of the regular tests, 11% of the cost of hospital per stay, and 6% of the cost of general medications per year.

Results

An 83-year-old man with chronic heart failure presented early signs of decompensation four times since 2010 and were alerted to the HF specialist through the combination of self-report and telemonitoring. The patient’s symptoms were treated in time and hospital readmission was avoided. The cost of the combination in the first year was 230.0 USD, which was 85% of the cost of regular tests (271.0 USD), 30% of the cost of hospital per stay (783.7 USD), and 15% of the cost of the general medications per year (2351.0 USD). From the second year, the cost of the combination (89.9 USD) declined to 33% of the regular tests, 11% of the cost of hospital per stay, and 6% of the cost of general medications per year.
Conclusions The combination of self-report and telemonitoring is an inexpensive but effective measure to improve the early detection of signs of decompensation event so as to allow prompt treatment and, reduce the high cost of hospital readmission in the management of chronic heart failure.

PROTECTIVE EFFECTS OF OPTIMAL PRESCRIPTION OF JIASHEN ON MYOCARDIAL INFARCTION WITH THE SUPPRESSION OF RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM IN RATS

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Objectives We tested the hypothesis that optimal prescription of Jiashen (OPJSH), a traditional Chinese medicine prescription, attenuates renin-angiotensin-aldosterone system (RAAS) to protect cardiac function and reduce myocardial infarct size (IS) after myocardial infarction.

Methods Male Sprague-Dawley rats (9–10 weeks) were subjected to sham-MI or MI by ligating the left anterior descending coronary artery for 1 week. The rats were divided into five groups: sham, MI, OPJSH (3 g/kg/day), OPJSH (6 g/kg/day), and losartan (an AT1 antagonist, 10 mg/kg/day). The vehicle, OPJSH, or losartan was given by oral gavage once a day after MI. Both IS and cardiac function were determined using TTC staining and Echocardiography at 1 week after MI, respectively. The levels of angiotensin II (ANG II) and aldosterone (ALD) in the non-infarcted area of the left ventricle were assayed using ELISA at 1 week after MI.

Results OPJSH (3 or 6 g/kg/day) administered after MI reduced IS compared with MI group (39±9%, 33±13% vs 55±8%, p<0.05) with the greater effect at a dose of 6 g/kg/day. Administration of losartan also reduced IS compared with MI group (39±6% vs 55±8%, p<0.05). Compared with MI group, administration of OPJSH (3 or 6 g/kg/day) improved cardiac function as evidence by partially preventing the increases in LVESD (0.87±0.15 vs 0.72±0.13 or 0.65±0.13 cm, p<0.05) and LVEF (0.72±0.15 or 0.55±0.16 or 0.45±0.16 cm, p<0.05), and the decreases in LVEDD (39.0±8.1% vs 53.6±20.1% or 69.4±15.6%, p<0.05) and LVFS (16.3±3.8% vs 25.6±12.8% or 36.5±13.9%, p<0.05), the greater effect was achieved at a dose of 6 g/kg/day. Losartan treatment also improved cardiac function compared with MI group as shown by the normalisation of LVESD (0.49±0.08 vs 0.87±0.15 cm, p<0.05) and LVEF (0.30±0.06 vs 0.72±0.15 cm, p<0.05), and attenuating the decreases in LVEF (75.4±6.9% vs 39.0±0.06%, p<0.05) and LVFS (38.6±4.2% vs 16.3±5.3%, p<0.05). Additionally, administration of OPJSH (3 or 6 g/kg/day) attenuated the increases in myocardial levels of ANG II and ALD (17.7±0.02 or 1.77±0.04 vs 2.01±0.06 ng/mg protein, p<0.05; ALD: 1353±52 or 1356±34 vs 1571±52 pg/mg protein, p<0.05). Losartan treatment also inhibited the increases in myocardial level of ALD compared with MI group (1264±51 vs 1571±52 pg/mg protein, p<0.05).

Conclusions Our data demonstrated that in agreement with losartan-induced cardioprotection, OPJSH given after MI reduced myocardial IS and improved cardiac function that was associated the decreases in myocardial levels of ANG II and ALD. The results indicate that OPJSH protects against MI possibly via attenuating the RAAS. The results suggest that OPJSH may have a beneficial potential for the prevention and treatment of MI.

EFFECT OF SHENMAI INJECTION ON CARDIAC FUNCTION IN GERONTAL PATIENTS WITH CHRONIC HEART FAILURE

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Objectives To investigate the effect of Shenmai injection on the therapeutic effect and cardiac function and brain natriuretic peptide (BNP) in gerontal patient with chronic heart failure.

Methods 64 patients age more than 65 years with chronic heart failure were randomly divided into two groups: the treatment group (n=34) and control group (n=30). Patients in the control group were given routine therapy including oxygen inhaling, cardiotoxic, diuresis, blood vessels extension, correcting the fluid and electrolyte imbalance, and the patients in the treatment group were given Shenmai injection 100 ml every day underlying the routine therapy. The course of treatment was 4 weeks. Observe the NYHA class, left ventricular end diastolic diameters (LVEDD), left ventricular ejection fraction (LVEF), cardiac output (CO), stroke volume (SV) and serum BNP of the patients before and after treatment.

Results Every index of cardiac function and BNP of patients in two groups were significantly improved (p<0.05). The total effective ratios of the improvement about NYHA class in patients in treatment group (77.2%) is significantly higher than those in control group (65.3%) (p<0.05). And the LVEF (0.61±0.18, 0.60±0.16) ml and serum BNP (500±25.6) ng/l of patients in treatment group after therapy were significantly different to the patients in control group (p<0.05), but there were no difference of the LVEDD and CO of patients between two groups (p>0.05).

Conclusions Shenmai injection association with routine treatment can improve the therapeutic effect and cardiac function of the gerontal patients with chronic heart failure.

EARLY DETECTION OF SUBCLINICAL EPIRUBICIN-INDUCED CARDIOTOXICITY USING TWO-DIMENSIONAL SPECKLE TRACKING ECHOCARDIOGRAPHY

doi:10.1136/heartjnl-2012-302920o.29

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Objectives To assess the early subclinical epirubicin-induced cardiotoxicity during treatment of non-Hodgkin’s lymphoma using two-dimensional (2D) speckle tracking echocardiography (STE).

Methods Thirty-six patients (15 male/21 female) aged 56.88±9.76 were included. Global longitudinal strain (GLS), circumferential strain (GCS) and radial strain (RS) were determined by 2D-STE before and 1 day after the last dose of epirubicin.

Results Despite normal LVEF, after chemotherapy, CS, and RS reduced from 17.92±1.93% to −16.59±2.16% (p<0.01), from −20.46±3.99% to −18.01±2.16% (p<0.01), and from 23.90±5.10% to 21.86±6.08% (p>0.05) respectively. Among sex, age, cumulative doses of epirubicin (mg/m²), cigarette smoking, hypertension and diabetes, hypertension was the only negative predictor of CS decrease (p=0.036, 95% CI 3.03 to 4.06), and diabetes was the only negative predictor of CS decrease (p=0.009, 95% CI 1.16 to 7.50).
Conclusions 2D-STE may help to detect Subclinical systolic myocardial abnormalities presented in asymptomatic non-Hodgkin’s disease patients shortly after epirubicin treatment.

GW23-e0237 PRELIMINARY STUDY OF REAL-TIME THREE-DIMENSIONAL DOBUTAMINE STRESS ECHOCARDIOGRAPHY FOR CORONARY ARTERY DISEASE ASSESSMENT

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Objectives To evaluate the efficacy and safety of Real-time three-dimensional dobutamine stress echocardiography for coronary artery disease assessment.

Methods Fourteen patients suspected of coronary artery disease (CAD) underwent Real-time three-dimensional dobutamine stress echocardiography, initial dobutamine infusion was 5 μg kg⁻¹ min⁻¹, followed by 10 μg kg⁻¹ min⁻¹ and peak infusion 20 μg kg⁻¹ min⁻¹ in 3 min stages. The Real-time three-dimensional (RT3D) imagings were captured in baseline state, stress stages and after the study, the imagings were assessed by wall motion score index (WMSI) and regional ejection fraction (EF), the parameters of these two modalities were made comparison with coronary angiography (CAG), during the study adverse reactions were also observed.

Results All patients completed the stress study uneventfully. Compared with the CAG these two modalities having no significant difference (p=0.05) and having satisfying agreement (κ values 0.704 and 0.75 respectively), the diagnostic parameters of these modalities were: sensitivity 78% vs 89%, specificity 92% vs 98%, positive predictive value (PPV) 88% vs 94%, negative predictive value (NPV) 85% vs 91% and overall accuracy 86% vs 88%.

Conclusions Real-time three-dimensional dobutamine stress echocardiography is an effective and safe technique to assess coronary artery disease which has clinical application value.

Congenital heart disease and interventions

GW23-e1025 TRANSCATHETER CLOSURE OF PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECTS USING DIFFERENT OCCLUDERS: WAIST-LENGTH AND POST-PROCEDURAL ARRHYTHMIAS

doi:10.1136/heartjnl-2012-302920p.1

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Objectives Transcatheter closure of ventricular septal defects (VSD) has become a promising treatment alternative to surgery in the past decade. However, excessive risk of post-procedural arrhythmias pose a major challenge for broad utilising of this technology. In order to explore the mechanism associated with post-procedural arrhythmias and decrease the risk, we evaluated the relationship between different waist-length occluders and incidence of post-procedural arrhythmias.

Methods In this retrospective study, 819 VSD patients who had been treated with transcatheter occluders in our centre from December 2001 to December 2010 were evaluated. Patients were treated in two groups, short-waist group and long-waist group, based on different waist-sized occluders used in the transcatheter procedures. Transthoracic echocardiographic (TTE) and left ventricular angiography were performed before and after occluder deployment to confirm no residual shunt and aortic valve regurgitation. All patients were followed up at 1, 3, 6, and 12 months after the procedure and once a year thereafter. Clinical examination, electrocardiography (ECC), and TTE were conducted during the follow up visits.

Results From December 2001 to December 2010, 234 patients had been deployed short-waist occluders (1.8 mm) and 571 had long-waist occluders (3.5 mm). 98.3% (805/819) of the patients, 98.7% in the short-waist group and 97.9% in the long-waist group, had successful closure of VSD during the procedure. Double-disc occluders were used in both treatment groups. No baseline characteristics in two groups, such as age, gender, body weight affect the treatment results. Average follow-up period was 35 months (34.2 ±21.9). Patients treated with long-waist occluders had significantly less arrhythmias, including complete right bundle branch block (CRBBB), complete left bundle branch block (CLBBB), incomplete right bundle branch block (IRBBB), left anterior bundle branch block (LABB), junctional tachycardia, or complete atrial ventricular block (cAVB) than that in the short-waist group (p=0.001). Particularly, 7 (5.0%) patients in the short-waist group had cAVB and 3 (1.5%) required permanent pace-maker insertion. In the long-waist group, 4 (0.7%) patients had cAVB and 1 (0.15%) had permanent pace-maker placement. The difference was statistically significant (p=0.017). Other complications in addition to post-operative arrhythmias were also monitored after the procedure. In short-waist group, incidence of other complications, such as haemolysis, groin haematoma, residual shunt and valve regurgitation, was 31.6% (74 patients). In the long-waist group, the incidence was numerically lower. 140 patients (24.5%) had complications mentioned above. The differences between two groups are not statistically significant (p=0.091). After in-hospital medical management, groin haematoma and hemolysis were disappeared in all patients. In 1-year follow all residual shunt were recovered. 21 (9.0%) patients in short-waist group had minor or minimal valve regurgitation, while in long-waist group, 64 (11.2%) patients had such complications. No statistical significant differences were noted between two groups (p=0.579).

Conclusions Waist-length of VSDs might be related to post-procedural severe AVB in congenital VSD patients underwent transcatheter occlusion.

GW23-e0892 CLINICAL APPLICATION STUDY ON INTERVENTIONAL OCCLUSION FOR PATIENTS WITH MORE EXPORTS SAC-TYPE MEMBRANOUS VENTRICULAR SEPTAL DEFECTION

doi:10.1136/heartjnl-2012-302920p.2

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Objectives To investigate the feasibility, safety and efficacy of domes
tic small waist big edge-type occluder for parions with more export sac-type membranous ventricular septal defect (VSD), sum up its technical problems and the choice of treatment strategies.

Methods 20 patients with sac-type membranous VSD, left ventricular angiography at LAO45–60° plus CAOD20–25°, the left ventricular side entrance diameters were 7–21 (10.9±5.2) mm, more than two exports in right ventricular surfaces, and the largest outlet diameters were 3–10 (4.8±2.9) mm. According to the result from transthoracic echocardiography (TTE) and angiography to determine the sac-bag size,
SURGICAL TREATMENT OF FIVE PATIENTS WITH INTERRUPTED AORTIC ARCH AND AORTOPULMONARY WINDOW

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Objectives To summarised review the surgical experience of single stage repair of interrupted aortic arch (IAA) associated with aorto-pulmonary window (APW) in five patients.

Methods Between December 1997 and December 2009, five patients (male 4, female 1) diagnosed IAA with APW were surgically repaired. The operative age was 1.7 months-13 years (median age, 1.6 years) old and body weight was 4.7–26 kg. Three patients were IAA type A and type B as well as 1 type C. Two patients were APW type I and 3 type III. The associated anomalies included aortic origin of the right pulmonary artery, subvalvular aortic stenosis, mitral regurgitation and atrial septal defect. Extracorporeal circulation was intubed through patent ductus arteriosus in three cases and femoral artery associated with ascending aorta in two cases. Aortic arch was re-built by profound hypothermia circulation arrest and end-to-side anastomosis directly or broadly with pericardium. Ascending aorta was blocked highly and APW was patched after cardioplegia.

Results One case died of pulmonary hypertension crisis. There were one case of tracheotomy and one case occurred severe pulmonary hypertension at average 22 months follow-up.

Conclusions IAA associated APW is a rare congenital cardiac anomaly that accounts for high mortality in infant because of progressive pulmonary hypertension. Once definite diagnosis, primary single stage repair should be used as the first choice, and will achieve high success rate and good long-term prognosis. Ultrasound cardiogram, cardiovascular CT and angiography can reduce misdiagnosis. A median sternotomy incision was made, and the entire arch vessels were mobilised. Cardiopulmonary bypass was instituted between a single venous cannula in the right atrial appendage and a single arterial cannula in the distal portion of the ascending aorta. Such as complex aortic arch abnormalities, pulmonary thick expansion can also be used to establish cardiopulmonary bypass through the femoral artery. The APW was closed through aortic way in order to reveal the edge of the defect, the aortic valve and coronary artery. Accurate preoperative prediction of pulmonary artery pressure, conscious sedation, hyperventilation slightly, vasodilating agent and vasoactive drugs are of great importance in preventing pulmonary hypertension crisis.

GW23-e2379  MIR-27B EXPRESSION AND SIGNIFICANCE OF PULMONARY HYPERTENSION IN CONGENITAL HEART DISEASE

doi:10.1136/heartjnl-2012-302920p.4

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Objectives To investigate the clinical significance of blood brain natriuretic peptide (BNP) testing in patients with acute dyspnoea due to differential due to cardiac and pulmonary.

Methods The selected object: Select January 2011 to January 2012, Gannan Medical College First Affiliated Hospital, Department of Cardiothoracic Surgery, Department of Respiratory Medicine, Department of Cardiology, emergency inpatient treatment of patients with acute dyspnoea included in the study. Trauma, cardiac tamponade, acute coronary syndrome, congenital heart disease, renal insufficiency diseases were excluded. Selected 231 cases of difficulty in breathing patients in our hospital, 105 cases of 126 cases of male, female, cardiogenic group of 96 cases, 145 cases of pulmonary group. Methods: mining outer peripheral venous blood 1 ml EDTA, the application of Bayer company ACS: 180 immunoluminometric quantitative testing equipment, the use of the Bayer BNP reagents and double-antibody sandwich immuno-fluorescence assay plasma BNP concentrations, the normal value is 0–100 ng/l, respectively. The application GE Vivid5 systemic digital colour Doppler ultrason conventional echocardiography, measured and recorded LVED and LVEF.

Results (1) Cardiac group: The average level of plasma BNP (604.78±157.70) ng/l, pulmonary group: BNP average (43.56±32.73) ng/l, significantly lower than the cardiac group (p<0.01). Plasma BNP concentrations of heart failure severity increased can be drawn from the cardiac group, of which 28 cases of NYHA grade II, III grade 30 cases, 23 cases of grade IV, BNP levels (246.56±883.42) ng/l, (568.23±153.68) ng/l, and (1123.83±186.56) ng/l. (2) Two groups of patients with plasma BNP levels, LVED, the comparison of LVEF, heart failure patients with BNP levels and LVED was positively correlated (r=0.56, p<0.01), and LVEF was negatively correlated (r=−0.53, p<0.01). 34 cases of NYHA grade II, 36 cases of grade III, 26 cases of grade IV, the LVED value, respectively (56.4±5.8) mm (61.7±6.5) mm (65.4±5.7) mm. LVEF (48±9)% (40±8)% (50±6)%.

Conclusions Compared with cardiac dyspnoea group and pulmonary dyspnoea group, BNP levels were significantly increased, and is proportional to the BNP and the severity of heart failure, heart failure, BNP levels were positively correlated with LVED was negatively correlated with LVEFprompt the release of BNP directly related to ventricular pressure load over, with the rise of ventricular pressure overload, ventricular myocytes increased secretion, and to determine the severity and changes in patients with heart failure by BNP. With the advent of the BNP rapid diagnostic tests, clinical detection of BNP levels has become more sophisticated, timely detection of clinical bedside quickly distinguish between dyspnoea,
early diagnosis and rational treatment of patients with breathing difficulties to provide excellent technical support.

GW23-e0894 CLINICAL APPLIED RESEARCH OF PERCUTANEOUS BALLOON PULMONARY VALVE FOR CONGENITAL PULMONARY VALVE STENOSIS

doi:10.1136/heartjnl-2012-302920p.5

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Objectives To evaluate the clinical efficacy of percutaneous balloon pulmonary valvuloplasty (PBPV) for pulmonary valve stenosis (PS).

Methods 20 patients, through clinical, ECG, chest X-ray and cardiac ultrasound, were diagnosis as pure PS. Before PBPV, determination PS’s type and valve annulus size, to select balloon diameter larger than its about 20–40%. After balloon expansion instantly measured pulmonary pressure gradient, and observed the pulmonary valve open, ejection, pressure gradient, tricuspid and pulmonary valve regurgitation after PBPV.

Results All 20 patients were successful with the balloon dilation, pressure gradient decreased 63.65% (p<0.01), 1 patients had mild pulmonary valve regurgitation, and 1 case in intraoperative occurred sinus bradycardia and disappeared by using atropine, no any serious complications.

Conclusions PBPV treatment for pulmonary valve stenosis with a high success rate, little trauma and few complications, and could be the first choice for PS treatment.

GW23-e1038 BILATERAL CORONARY ARTERY FISTULA AS A CAUSE OF ANGINA PECTORIS

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Objectives A 75-year-old female patients was admitted to our hospital presenting with episodes of exhausted chest pain for 2 years.

Methods A continuous murmur was heard over the precordium. The repeated ECG and echocardiograms were normal. At cardiac catheterisation, a left-to-right shunt of 1.33:1 (Qp:Qs) was found. Coronary angiography showed one fistula arising in left anterior descending artery (LAD) ending in the left atrium, and a second fistula arising in right coronary artery (RCA) and terminating in the pulmonary artery. Multislice computed topographic angiography showed the left and right fistulas entering the left atrium and the pulmonary artery, respectively. The patient was referred for surgical ligation of the fistulas. Two weeks later the patient was discharged and she has shown symptom-free at follow-ups.

Results Generally, most coronary artery fistulas (CAFs) manifest as a single fistula and drain into one of the cardiac chambers; cases of multiple fistulas are rare. According to the site of drainage, CAFs have varied physiologic presentations. A fistula that drains into the left atrium does not result in a left-to-right shunt, but rather causes a volume load similar to mitral regurgitation. The CAFs that drain into the pulmonary arteries are similar hemodynamically to a patent ductus arteriosus. Most CAFs are often clinically silent and inconsequential. However, bilateral CAFs may have a clinical and embryological significance on the basis of coronary steal phenomenon.

Conclusions There appears to be good consensus that all asymptomatic patients should undergo closure of medium or large CAFs.

GW23-e0570 COMPARATIVE STUDY OF TWO OCCLUDER-RELEASE TECHNIQUES IN TRANSCATHETER CLOSURE OF PERIMEMBRANOUS VENTRICULAR SEPTAL DEFECT

doi:10.1136/heartjnl-2012-302920p.7

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Objectives Reported experience with the retained guidewire technique in transcatheter closure of perimembranous ventricular septal defect (VSD) is limited. To compare two occluder-release techniques in transcatheter closure of perimembranous VSD we reviewed our experience in 48 procedures performed on 48 patients.

Methods From January 2009 to January 2011, 48 patients (26 males and 22 females) with perimembranous VSD underwent an attempt of transcatheter closure using the amplatz occluder (made in China). The mean age of patients was (9.1±4.9) years (ranged from 5 to 18 years). The mean body weight of patients was (31.1±17.9) kg (ranged from 12 to 52 kg). The mean diameter of VSD measured by transthoracic echocardiography (TTE) was (6.4±3.6) mm (ranged from 3 to 11 mm). The patients were grouped by either the retained guidewire technique (n=24) or non-retained guidewire technique (n=24). Occluder was released through the right heart system. During the operation, an arteriovenous guide wire loop with a 0.035 inch exchange length guide wire (Cordis) was set up through a femoral vein approach. A long sheath was advanced to the left ventricle through the arteriovenous guide wire loop and positioned beneath the aortic valve. Then the guide wire was removed traditionally in non-retained guide wire group, or was not removed creatively in retained guide wire group. The VSD occluder was deployed through the long sheath under fluoroscopic control and echo cardiographic guidance. Procedure time, X-ray exposing time, technical successful rate and complication rate were compared between two groups. All patients were followed up in 1, 6 and 12 months after procedures of TTE, X-ray and electrocardiography.

Results No significant differences were found in gender, age, weight, the average diameter of VSD (6.3±3.5 vs 6.5±3.7 mm, p>0.05), the distance from VSD to aortic valve (2.3±1.9 vs 2.5±2.1 mm, p>0.05) or the average diameter of amplatz occluder (9.5±4.1 vs 9.7±5.2 mm, p>0.05). No significant difference was found in technical successful rate (91.7% vs 95.8%, p>0.05), number of applications, or major complication rate (2.1% vs 2.1%, p>0.05). The procedure time in retained guidewire group was less than that in non-retained guide wire group (66.2±31.4 vs 97.5±54.5 min, p<0.05). The X-ray exposing time in retained guide wire group was less than that in non-retained guide wire group (12.4±6.3 vs 21.6±10.7 min, p<0.05). Except 7 cases with mild residual shunt that disappeared in 12 months, no serious complication were found in the other patients, such as device transposition, haemolysis, atrioventricular block, valvular regurgitation and cardiac perforation.

Conclusions These data suggest that although outcomes and major complication rates are similar for the two groups, transcatheter closure of perimembranous ventricular septal defect with retained guide wire technique would shorter operative time, and reduce the amount of x-ray irradiation of the doctors and patients.
ABSTRACTS

**GW23-e0709**  INTERVENTIONAL THERAPY OF MULTIPLE ATRIAL SEPTAL DEFECTS  
Dai Hai-long, Lu Yi-bing, Zhang Wei-hua, Guang Xue-feng, Yin Xiao-long, Deng Jie, Yang Dong, Zhang Wei-hua. Yan’an Hospital affiliated to Kunming Medical College

**Objectives** To evaluate the safety and efficiency of transcatheter closure of multiple atrial septal defects.

**Methods** A total of 10 patients (5 males and 5 females) with multiple atrial septal defects underwent transcatheter intervention therapy from October 2004 to January 2010. All the patients received transcatheter closure of multiple atrial septal defects guided by X ray fluoroscopy and echocardiography by using Amplatzer septal occluder. Their mean age was (57.0±35.6) years. Their mean weight was (52.0±16.9) kg. Follow-up with electrocardiogram (ECG) and transthoracic echocardiography (TTE) was undertaken 2 d, 1 m, 3 m, 6 m and 12 m after the procedures.

**Results** Ten patients were treated successfully. One patient detected slight crevice shunt after the procedure by TTE, they were detected disappearance of the crevice shunt by TTE at 6 months after the procedure. No patient encountered complications during follow-up.

**Conclusions** Transcatheter closure of multiple atrial septal defects is safe, effective and feasible.

**GW23-e0713**  INTERVENTIONAL THERAPY OF RESIDUAL SHUNTS AFTER SURGERY REPAIR OF CONGENITAL HEART DISEASE  
Dai Hai-long, Zhang Wei-hua, Lu Yi-bing, Guang Xue-feng, Yin Xiao-long, Deng Jie, Yang Dong, Zhang Wei-hua. Yan’an Hospital affiliated to Kunming Medical College

**Objectives** To probe the safety and clinical results of interventional therapy of residual shunts after surgery repair of congenital heart disease.

**Methods** A total of 10 patients (6 males and 4 females) with residual shunt after surgery repair underwent transcatheter intervention therapy from January 2004 to April 2011, including 7 patients with residual shunt after surgery repair of ventricular septal defect (VSD), 2 patients with residual shunt after surgery repair of patent ductus arteriosus (PDA), and 1 patient with residual shunt after surgery repair of patent ductus arteriosus (PDA). Their mean age was (27.6±10.8) years. Their mean weight was (59.2±7.6) kg. Follow-up with electrocardiogram (ECG) and transthoracic echocardiography (TTE) was undertaken 2 d, 1 m, 3 m, 6 m and 12 m after the procedures.

**Results** Ten patients were treated successfully. No patient encountered complications during follow-up.

**Conclusions** Transcatheter closure of residual shunts after surgery repair of congenital heart disease is safe, effective and feasible.

**GW23-e1201**  VARIATION OF P-WAVE DISPERSION BEFORE AND AFTER TRANSCATHETER CLOSURE IN PATIENTS WITH ATRIAL SEPTAL ANEURYSM  
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**Objectives** To investigate the variation of P-wave dispersion (Pd) before and after transcatheter closure in patients with atrial septal aneurysm (ASA).

**Methods** 152 patients with ASA (65 males and 87 females, average age (29.6±16.3) years, range 10–67 years old) were selected by the clinical, ECG, x-ray, transthoracic echocardiography (TTE) examination from January 2003 to April 2010 in our hospital. ASAs were diagnosed by TEE based on the criteria of a minimal aneurysmal diameter of amplatzer occluder. Their mean weight was (38.8±22.0) kg. They underwent 2 d, l m, 3 m, 6 m and 12 m after the procedures.

**Results** 152 patients were occluded successfully and the mean diameter of amplatzer occluder was (21.4±6.6) mm (ranged from 14 to 36 mm). 9 cases with porous type were selected just one occluder. The mean Pd in patients with ASA 1 year after transcatheter closure was (21.4±6.6) mm (ranged from 14 to 36 mm). 9 cases with porous type were selected just one occluder. The mean Pd in patients with ASA 1 year after transcatheter closure was (21.4±6.6) mm (ranged from 14 to 36 mm).

**Conclusions** Transcatheter closure treatment in patients with atrial septal aneurysm may shorten the atrial conduction time and promote the stability of atrial electrical activity by reshaping the heart.

**GW23-e0715**  CLINICAL OUTCOME OF TRANSCATHETER INTERVENTION THERAPY FOR COMBINED CONGENITAL CARDIAC DEFORMITIES IN THE SAME SESSION  
1Dai Hai-long, 1Guang Xue-feng, 1Lu Yi-bing, 2Zhang Wei-hua, 1Yin Xiao-long, 1Yan’an Hospital affiliated to Kunming Medical College, 2Yan’an Hospital affiliated to Kunming Medical College

**Objectives** To probe the safety and clinical results of percutaneous transcatheter intervention therapy in patients with combined congenital heart deformities in the same session.

**Methods** Thirty patients (14 males and 16 females) with combined congenital heart deformities underwent simultaneous transcatheter intervention therapy, including 7 patients with atrial septal defect (ASD) and patent ductus arteriosus (PDA), 10 patients with ASD and ventricular septal defect (VSD), 6 patients with ASD and pulmonary stenosis (PS), 5 patients with ASD and PDA, 1 patient with PDA and PS, 1 patient with VSD, PDA and ASD. Their mean age was (17.9±13.5) years. Their mean weight was (38.8±22.0) kg. They underwent transcatheter therapy simultaneously with the sequential algorithm as balloon pulmonary valvuloplasty at first, followed by the occlusion of VSD, then the occlusion of PDA, then ASD, which can be adjusted depending on the circumstances. Follow-up with electrocardiogram (ECG) and transthoracic echocardiography (TTE) was undertaken 2 d, l m, 3 m, 6 m and 12 m after the procedures.

**Results** 30 patients were treated successfully. In the 7 patients complicated with PS, the systolic pressure gradient across the pulmonary valve decreased from (46.1±15.1) mm Hg (1 mm Hg=0.133 kPa) to (17.6±3.8) mm Hg and the difference was significant (p<0.01). 1 patient showed incomplete right bundle branch block, one patient showed complete right bundle branch block and 1 patient showed incomplete left bundle branch block after intervention therapy; and ECG showed normal after treatment with dexamethasone. one patient with VSD and ASD, preoperative and 10 days after the procedure whose ECG showed bifascicular block. The patient was given a permanent implanted cardiac pacemaker. Among two patients with...
VSD, a slight crevice shunt was detected after the procedure by TTE, they were detected disappearance of the crevice shunt by TTE at 6 months after the procedure. No patient encountered complications during follow-up.

Conclusions: Simultaneous transcatheter therapy of combined congenital heart deformities can obtain satisfactory effect by strict indication control and procedure manipulations.

GW23-e1708 BERRY SYNDROME—TWO CASES OF SUCCESSFUL PREOPERATIVE AND POSTOPERATIVE ECHOCARDIOGRAPHY EVALUATION
doi:10.1136/heartjnl-2012-302920.p.12
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Objectives: Berry syndrome is a very rare congenital cardiovascular anomaly. We report two infant cases in 2011.12–2012.1.

Methods: Both the two cases were diagnosed by echocardiography, and were validated by CT scan and surgery. The anatomical structure and hemodynamic condition of the two cases were evaluated by echo after repair.

Results: Case 1, male, 4-month-old, who referred to our hospital as pneumonia and 3/6 cardiac systolic murmur; Case 2, male, 2-month-old, who referred to our hospital as paroxysmal cough, choking one time accompanied by cyanosis and 3/6 cardiac systolic murmur; Echocardiography and CT scan revealed the two cases suffered with left heart over volume and with the anatomic characteristics of Berry syndrome: (1) An AP window (diameter 16 mm and 14 mm), (2) a type A interrupted aortic arch, (3) An RPA arising from ascending aorta, (4) A PDA. Two cases received surgical repair. Postoperative echo demonstrated satisfactory arch reconstruction and normal relationship of the two great arteries. The peak velocities of blood flow in aortic arch and descending aorta were increased, the measurement were 2.3 m/s/24 mm Hg and 2.6 m/s/26 mm Hg respectively.

Conclusions: For Berry syndrome early clinical recognition, prompt echocardiography and CT scan, early surgical operation can lead good result. Postoperative echocardiography is mandatory because stenosis at the site of the aortic reconstruction and the RPA is a potential problem. Echocardiography could provide accurate preoperative diagnosis and postoperative evaluation.

GW23-e0300 E64D DETERIORATES POST-MYOCARDIAL INFARCTION LEFT VENTRICULAR REMODELLING BY INHIBITING CATHEPSIN S-MEDIATED FIBROBLAST TRANSDIFFERENTIATION
doi:10.1136/heartjnl-2012-302920q.2
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Objectives: Extracellular matrix (ECM) turnover is a major process of left ventricular (LV) remodelling following myocardial infarction (MI). Cysteiny1 cathepsins participate in ECM catabolism in human arterial diseases, but their functions in cardiac remodelling remains unknown.

Methods: Mouse MI model was induced by left anterior descending (LAD) artery ligation. Both infarct and remote myocardium from post-MI 1, 2, 3, 7 and 28 days were collected to evaluate mRNA expressions and activities of different cysteiny1 cathepsins comparing to sham operated ones. To further investigate the role of cathepsins in post-MI LV remodelling process, a non-selective cysteiny1 cathepsin inhibitor E64d was administrated within the first 7 days of post-MI. Cardiac functions were analysed by echocardiography at baseline, 7 and 28 days post-MI. Mice were sacrifice at 7 and 28 days post MI for further studies.

Results: Cats expression and activity were increased in infarcted mouse myocardium. E64d administration deteriorated cardiac functions at 7 and 28 days post-MI, although did not change significantly infarct size. This cathepsin inhibitor increased post-MI inflammatory cell infiltration and cytokine expression, altered collagen type-I and type-III deposition, and suppressed the expressions of myofibroblast trans-differentiation-essential protein fibronectin extra domain A (ED-A) and myofibroblast marker a-smooth muscle actin (α-SMA), but did not affect myocardium apoptosis or angiogenesis. Further mechanistic studies demonstrated that inhibition or deficiency of CatS reduced myocardium expression of ED-A

GW23-e2648 COMPARISON OF VARIOUS NichES FOR ENDOThelial PROGENITOR CELL THERAPY ON ISCHAEMIC MYOCARDIAL REPAIR: COEXISTENCE OF HOST COLLATERALISATION AND AKT-MEDIATED ANGIogenesis PRODUCES A SUPERIOR MICROEnVIRONMENT
doi:10.1136/heartjnl-2012-302920q.1
Zhang Shaoheng, Shanghai yangpuqiu zhongjiyuyuan

Objectives: Comparative studies are lacking that show the effects of different micro environments on the activity of engrafted stem cells after myocardial infarction (MI). Here, we analysed the temporal and spatial variations of angiogenesis, collateralisation, and the expression of Akt-related signals after MI to test if the effects of endothelial progenitor cells (EPCs) were different.

Methods and Results: After the induction of MI, pigs were selected that did not develop a collateral coronary circulation (CCC; R0) or developed a significant CCC (R2). Both sets were allocated randomly to four groups: PBS (intramyocardial [i.m.] injection of PBS); Tx (EPC transplantation); LY294002 (i.m. injection of an Akt inhibitor); and EPCs plus LY294002. Infarcted porcine hearts under different time-points and collateralised conditions exhibited a variety of vascular microenvironments. At 14 d post-MI, angiogenesis and the expression of Akt-mediated angiogenic cytokines predominated in R2 porcine hearts. When grafted into this microenvironment, EPCs induced the greatest effects in impeding the development of heart failure, preserving LV function and dimensions, and inhibiting infarct expansion. LY294002 significantly reduced these effects.

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Conclusions: These findings suggest that the microenvironment that coexists with collateralisation and Akt-mediated angiogenesis appears to be more beneficial to cardiac repair induced by EPC therapy than other niches after MI.

Cardiomyopathy

GW23-e1163 E247 COMPARISON OF VARIOUS NichES FOR ENDOThelial PROGENITOR CELL THERAPY ON ISCHAEMIC MYOCARDIAL REPAIR: COEXISTENCE OF HOST COLLATERALISATION AND AKT-MEDIATED ANGIogenesis PRODUCES A SUPERIOR MICROEnVIRONMENT
doi:10.1136/heartjnl-2012-302920q.1
Zhang Shaoheng, Shanghai yangpuqiu zhongjiyuyuan

Objectives: Comparative studies are lacking that show the effects of different micro environments on the activity of engrafted stem cells after myocardial infarction (MI). Here, we analysed the temporal and spatial variations of angiogenesis, collateralisation, and the expression of Akt-related signals after MI to test if the effects of endothelial progenitor cells (EPCs) were different.

Methods and Results: After the induction of MI, pigs were selected that did not develop a collateral coronary circulation (CCC; R0) or developed a significant CCC (R2). Both sets were allocated randomly to four groups: PBS (intramyocardial [i.m.] injection of PBS); Tx (EPC transplantation); LY294002 (i.m. injection of an Akt inhibitor); and EPCs plus LY294002. Infarcted porcine hearts under different time-points and collateralised conditions exhibited a variety of vascular microenvironments. At 14 d post-MI, angiogenesis and the expression of Akt-mediated angiogenic cytokines predominated in R2 porcine hearts. When grafted into this microenvironment, EPCs induced the greatest effects in impeding the development of heart failure, preserving LV function and dimensions, and inhibiting infarct expansion. LY294002 significantly reduced these effects.

Conclusions: These findings suggest that the microenvironment that coexists with collateralisation and Akt-mediated angiogenesis appears to be more beneficial to cardiac repair induced by EPC therapy than other niches after MI.
fibronectin, thus suppressed TGF-b1-induced fibroblast trans-differentiation and a-SMA expression, thereby leading to adverse collagen turnover, enlarged LV dilation, and deteriorated cardiac functions, similar to those from E64d-treated mice.

Conclusions E64d deteriorates LV remodelling and cardiac functions after experimental MI by affecting myofibroblast trans-differentiation via inhibition of CatS activity and suppression of fibronectin ED-A production.

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**ABSTRACTS**

GW23-e0309  **RB AND P130 CONTROL THE POST-MITOTIC PHENOTYPE IN ADULT HEART MUSCLE BY RECRUITING THE HETEROCHROMATIN PROMOTING FACTOR HP1γ TO GROWTH ASSOCIATED GENES**

doi:10.1136/heartjnl-2012-302920q.3

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**Objectives** Although the regenerative potential of the heart is a matter of debate, normal adult cardiac myocytes (ACM) are post-mitotic and E2F-dependent genes involved in G2/M and cytokinesis are stably repressed. However, the mechanisms underlying this silencing are unknown. Heterochromatin formation, which increases during cardiac differentiation, can regulate transcriptional silencing in a retinoblastoma protein (Rb)/E2F-dependent fashion.

**Methods** Iducible, cardiac-specific Rb and p130 double-knockout (IDKO) mice were created to investigate whether Rb or Rb-family member p130, specifically regulate the postmitotic state of ACMs. We compared G2/M and cytokinesis related genes by RT-PCR, heterochromatin formation by confocal analysis and HP1γ changes in G2/M and cytokinesis related genes by Chip between ACMs and IDKO ACMs.

**Results** ACMs within IDKO hearts lost their heterochromatin and up-regulated G2/M and cytokinesis related genes. IDKO ACMs spontaneously proliferated leading to 30% increased heart size within 3 weeks. It has been suggested that irreversible gene silencing by Rb family members is related to their ability to recruit HP1 to the promoters of E2F-dependent genes resulting in their incorporation into heterochromatin. In ACMs, depletion of HP1γ up-regulates expression of G2/M and cytokinesis genes. HP1γ is associated with promoters of G2/M and cytokinesis genes in ACMs; however, this binding was not detected in IDKO ACMs.

**Conclusions** Thus, Rb and p130 have overlapping roles in maintaining the postmitotic state of ACMs, through their interaction with HP1γ to direct heterochromatin formation and silencing of proliferation associated genes.

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GW23-e0836  **PREVALENCE AND RELATED FACTORS OF ARRHYTHMIAS IN PATIENTS WITH HYPERTROPHIC CARDIOMYOPATHY**

doi:10.1136/heartjnl-2012-302920q.5

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**Objectives** We aim to explore the incidence and risk factors of AF dangerous ventricular arrhythmias and bradyarrhythmia in patients with HCM, and improve the awareness of clinicians on hypertrophic cardiomyopathy (HCM) associated with life-threatening arrhythmias.

**Methods** We retrospectively collected the clinical data of 86 unrelated patients diagnosed as HCM in our hospital from January 2009 to January 2012, including each patient’s personal characteristics, clinical manifestations, echocardiography, 12-lead electrocardiography(ECG), 24 h Holter ECG monitoring, coronary angiography, left ventricular angiography and related treatment.

**Results**

1. In 86 patients with HCM, male and female patients were 56 and 30, respectively, and mean age was 58.4±14.3 years.
2. 21 patients (24.4%) had documented AF, 7 patients with paroxysmal AF and 14 patients with chronic AF 72 patients (85.7%) had premature ventricular contractions (PVCs), 36 patients (41.9%) had PVCs with Low grade ≥3, and 22 patients (25.6%) had non-sustained ventricular tachycardia (NSVT). eight patients (9.3%) had atrial fibrillation with slow ventricular rate and 2 patients (3.4%) had atrioventricular block (AVB) and nine patients (10.5%) had atrial fibrillation with slow ventricular rate and long RR interval (RR interval >2.0 s).
3. The mean age at examination was 64.1±11.0 years in patients with AF older than those with sinus rhythm (56.6±14.8 years) (p=0.037). Left atrial diameter (LAD) was greater in patients with AF than those without AF (45.5±5.2 mm vs 40.2±5.2 mm) (p<0.01). There were 8 cases (38.1%) in NYHA classes III and IV in AF group, more than those without AF (6.2%, p=0.001). And left ventricular ejection fraction (LVEF) in AF group was lower than those without AF (64.8±9.7% vs 69.4±8.1%, p=0.036).
4. Maximum left ventricular wall thickness (MLVWT) and LAD was greater in patients with dangerous ventricular arrhythmias (B group) than in patients without dangerous ventricular...
arrhythmias (A group) (23.1±5.4 mm vs 20.2±4.9 mm and 42.3±5.2 mm vs 40.4±5.8 mm, p=0.009 and 0.048, respectively). The incidence of AF in B group was significantly higher than in A group (36.1% vs 16.0%, p<0.05).

5. In patients with pacemaker implantation, the age (mean 67.6±7.4 years) was older than those without pacemaker implantation (mean 55.5±14.1 years, p=0.01). LVEF in patients with pacemaker implantation was significantly lower than in patients without pacemaker implantation (64.0±10.0% vs 69.3±5.1%, p=0.024). And the incidence of AF in patients with pacemaker implantation was significantly higher than in patients without pacemaker implantation (52.9% vs 17.4%, p<0.05).

Conclusions Our study showed the incidence of arrhythmias in patients with pacemaker implantation was positively correlated with age increment and bradyarrhythmia, was quite high. And the incidence of patients with HCM, including AF, dangerous ventricular arrhythmias was 41.9%, and its occurrence was associated with cardiac dysfunction and age. The prevalence of dangerous ventricular arrhythmias and bradyarrhythmia was 52.9%, and its occurrence was associated with cardiac dysfunction and age. The prevalence of dangerous ventricular arrhythmias and bradyarrhythmia was much higher than others without dangerous ventricular arrhythmias and bradyarrhythmia. Therefore, AF might play an important role in the prognosis of HCM patients.

GW23-e1634 THE ASSOCIATION BETWEEN SNP RS1739843 AND IDIOPATHIC DILATED CARDIOMYOPATHY IN CHINESE HAN POPULATION

Chen Feifei, Yang Yanzong. Dalian Medical Affiliated First Hospital

Objectives The aim of the study was to test whether rs1739843 is associated with IDC in a different ethnic population, namely a Chinese cohort.

Methods The study was a case-control study which included 306 IDC patients and 872 control subjects. We collected blood samples of two groups of subjects to extract DNA and amplify the desired gene fragment. rs1739843 was genotyped using fluorescent dye-based high-resolution melt analysis on a Rotor-gene 6200 System (Corbett Life Science) according to the protocols from the manufacturers.

Results rs1739843 showed significant association with IDC in a Chinese Han population (p=0.022). After corrected age, gender, diabetes mellitus and hypertension by logistic regression analysis, the association still maintained significant (p_adj=0.020, OR=0.782), and minor allele T was a protect allele; in a dominant model, rs1739843 and IDC showed significant association (p=0.046); after corrected age, gender, diabetes mellitus and hypertension presented association (p_adj=0.041, OR=0.778); in an addition model, it presented no association between the two aspects (p_adj=0.07), but after corrected rs1739843 was associated with IDC (p_adj=0.024, OR=1.327).

Conclusions HSPB7 gene single nucleotide polymorphism rs1739843 was associated with IDC and minor allele T was a protect allele.

GW23-e1592 MYOCARDIAL FAT DEPOSITION IN DILATED CARDIOMYOPATHY—ASSESSMENT BY USING MR WATER-FAT SEPARATION IMAGING

doi:10.1136/heartjnl-2012-302920q.8

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Objectives To prospectively investigate the prevalence of fat deposition in dilated cardiomyopathy (DCM) by fat-water separation imaging. An auxiliary aim was to determine the relationship between LV fat deposition and characteristic myocardial fibrosis, as well as cardiac functional parameters.

Methods Forty-eight patients with DCM were scanned on a 1.5 T MR scanner (MAGNETOM Avanto, Siemens, Germany) after written informed consent was obtained. The MR scan protocols included a series of short-axis LV cine imaging for functional analysis, fat-water separation imaging using V A R P R O, and late gadolinium enhanced (LGE) imaging for fibrosis. Fat-water separation imaging was covered the entire LV myocardium. Fat deposition and fibrosis location were compared to the scar regions on LGE images using 17-segment model. Statistical comparisons of LV global functional parameters, fibrosis volumes, and fat deposition were carried out using the Pearson correlation, student t test and multiple regressions.

Results A fat deposition prevalence of 29.2% (14/48) was found in areas of DCM. The patients with fat deposition had larger myocardial fibrosis (27.0±15.1 cm³ vs 12.8±6.1 cm³, p<0.001), larger LVEDV (267.8±48.8 ml vs 201.6±46.5, p=0.01) and decreased LV ejection fraction (19.5%±8.4 vs 29.0%±12.1, p<0.01). The volume of fat deposition was correlated with scar volume, LV ejection fraction, LV end-diastolic volume index, and LV end-systolic volume index.
Conclusions | Fat deposition is quite a common phenomenon in DCM. And it is associated with DCM characteristics such as fibrosis volume and LV function.

GW23-e1991 | INITIAL RESEARCH OF THE CLINICAL ROLE OF LATE GADOLINIUM ENHANCEMENT IN THE HYPERTROPHIC CARDIOMYOPATHY

| doi:10.1136/heartjnl-2012-302920q.9 |

| Zhao Tao, 1Lv Chuanjian, 1Zhao Shihua. 1Fuwai Cardiovascular Hospital; 2Henan province people’s hospital |

Objectives | To investigate the correlation between clinical features and the extent of myocardial hypertrophy and late gadolinium enhancement (LGE) in hypertrophic cardiomyopathy.

Methods | Seventy-nine consecutive patients with hypertrophic cardiomyopathy underwent cardiac MRI examination, first performed routine cardiac structure and function imaging followed by LGE. The myocardial thickness, left ventricular ejection fraction, left ventricular end-diastolic volume and other parameters were calculated according to the traditional 17 sectional method. LGE score was evaluated to each patient, too.

Results | There were 653 hypertrophic segments in the total 1345 enrolled segments, most located in the anterior interventricular septum (segment 2, n=64), following by segment 3, 5 and 8 with the hypertrophic segments number of 58, 57 and 57, respectively. LGE was positive in 453 segments, which most located in the anterior interventricular septum (n=64), too, following by segment 8, 9 and 14 with positive number of 39, 37 and 36, respectively. The diameter of left atrium and LGE positive were the independent risk factor of atrial fibrillation (HR=1.11, 1.12, respectively; p<0.01), and the area under the ROC was 0.726 and 0.743, respectively. LGE positive was the independent risk factor of non-sustaining ventricular tachycardia (NSVT) (HR=1.15; p<0.01) and the area under the ROC was 0.817.

Conclusions | The hypertrophic segments and LGE distribute disymmetrically in hypertrophic cardiomyopathy patients, and LGE was the independent risk factor of atrial fibrillation and NSVT.

GW23-e0561 | APPLICATION OF PERCUTANEOUS TRANSLUMINAL SEPTAL MYOCARDIAL ABLATION ON HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY

| doi:10.1136/heartjnl-2012-302920q.11 |

| Wang Yu, Liu Hongming, Zhang Hongjie, Guo Tao. The 1st hospital of Kunming Medical University |

Objectives | To evaluate the feasibility and efficiency of percutaneous transluminal septal myocardial ablation (PTSMA) for treatment of hypertrophic obstructive cardiomyopathy (HOCM).

Methods | Eleven patients with 1–10 years history of HOCM underwent the PTSMA. Left ventricular outflow tract gradient (LVOTG) were measured before and after septal branches occluded by 96% alcohol. The thickness of septal myocardium, width of LVOT and amplitude of systolic anterior motion (SAM) were also measured before, at the time of discharge and 1 month after PTSMA by echocardiography.

Results | Ten patients were accomplished by Sigwart method, among which, DDD pacemaker was implanted in one patient because of permanent complete heart block 5 days later. One patient died from acute myocardial infarction 4 h after ablation. Immediate post-operation, LVOTG decreased significantly from (90.40±41.95) mm Hg to (52.90±34.12) mm Hg (p<0.01). At the time of discharge, LVOTG and amplitude of SAM improved significantly (82.98±36.46 mm Hg vs 44.56±28.87 mm Hg; 4.1 ±1.57 mm Hg vs 2.3±1.06 mm Hg; p<0.01). At 1 month follow up, LVOTG, thickness of septal myocardium, width of LVOT and amplitude of SAM had a good direction to improvement (p<0.01).

Conclusions | PTSMA can significantly reduce LVOTG and has a satisfactory short-term efficacy in the treatment of HOCM. Risk control must be emphasised during the ablation procedure and further careful evaluation is needed.

GW23-e0310 | A NOVEL CHEMICALLY DEFINED CONDITION FOR HUMAN MENSTRUAL BLOOD-DERIVED STEM CELLS

| doi:10.1136/heartjnl-2012-302920q.10 |

| Rongrong Wu, Jian’an Wang. Department of Cardiology, Cardiovascular Key Lab of Zhejiang Province, The Second Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou 310000, P. R. China |

Objectives | The successful establishment of stem cell-based therapies for the repair of damaged myocardium after myocardial infarction (MI) requires an optimal stem cell resource that will offer benefits to a large number of patients with minimal complications. Recently, human menstrual blood-derived stem cells (hMBSCs) attract great attention for such therapies because of their vast source and multipotency to differentiate toward various cell lineages. To greatly facilitate the application of hMBSCs in cellular therapy, an improvement of their proliferation, survival and directed migration potential is required prior to in vivo transplantation.

Methods | We developed a chemically defined N2B27 medium combined with different groups of growth factors (IGF and FGF) for short-term cultivation of hMBSCs.

Results | After cultivated for 4 to 5 days, hMBSCs showed higher cell viability, maintained their original fibroblastic morphology and displayed increasing proliferative potential but no considerable change in the expression of CD29, CD34, CD45, CD105, CD117, CD166 and SSEA-4. Furthermore, in vitro migration assay using Transwell filters demonstrated that hMBSCs showed increasing migration potential after pre-cultured in N2B27 medium plus IGF and bFGF When transplanted into animal models with myocardial infarction, hMBSCs pre-treated in CDM showed great migration potential into various tissues including spleen, lung and heart of peri-infarcted zones. The increase of migration potential in hMBSCs may be due to the up-regulation of MMP-2, MMP-9, MMP-14 and SDF-1 α-CXCR7 axis.

Conclusions | Our findings suggest that N2B27 medium plus IGF and bFGF could be used for in vitro expansion of hMBSCs prior to in vivo transplantation.

GW23-e1016 | EFFECT OF DIFFERENT ANTIHYPERTENSIVE STRATEGIES ON THE MICROALBUMINURIA EXCRETION

| doi:10.1136/heartjnl-2012-302920c.1 |

| Wang Hongyi, Chen Yuanhua, Ma Zhiyi, Xi Yang, Yang Fan, Sun Ningling. Heart Center, People’s Hospital, Peking University |

Objectives | Giving different therapy to hypertensive patients with microalbuminuria in order to find the appropriate individual therapy for this kind of high-risk hypertensive patients.

Methods | This is a multi-centre, randomised, positive controlled clinical study. Patients with essential hypertension, aged 18–
Objectives Essential hypertensive patients with elevated homocysteine in plasma, which is called H-type hypertension, has a high incidence in Chinese population; Though a point mutation in methylenetetrahydrofolate reductase (MTHFR C677T) has been associated with increased plasma homocysteine (Hcy) levels, pathogenetic mechanisms involved are still a matter of debate. Therefore, our study was designed to explore the influence of genetic and lifestyle factors on H-type hypertension risk in the rural area of Anqing, China.

Methods We used PCR restriction fragment length polymorphism (PCR-RFLP) to determine C677T polymorphism in MTHFR gene in hypertension patients. Then based on the three types of MTHFR genotypes (CC, CT&TT), we enrolled 241 cases of hypertension in total and each genotype had nearly equal number patients (n=76, 85±80). Then we examined the plasma Hcy level with HPLC, measured blood pressure with Standard Desktop mercury Sphygmomanometer and calculated the body mass index (BMI). A questionnaire was used to collect the lifestyle information of cigarette and/or alcohol consumption status.

Results 1. The average level of plasma Hcy was significantly higher in male than female (12.8±7.2 umol/l vs 9.7±4.7 umol/l, p<0.01); Patients with TT genotype had a significantly higher level of Hcy than those with CC or CT genotypes (p<0.01).

2. The proportion of H-type hypertension in all the hypertension cases was up to 44.4%. H-type hypertension was much more common in male patients, which was 60.3% compared to 29.6% in female. The risk of H-type hypertension in TT genotype was pronouncedly higher than in CT and CC genotypes (OR 3.2, 95% CI 1.7 to 5.8, p<0.01).

3. Multiple linear/logistic regression analysis with adjustment by multivariate didn’t identify marked relevance of Hcy level or H-type hypertension risk with other environmental variables including age, alcohol drinking, cigarette smoking, BMI, and baseline DBP and SBP.

Conclusions Our present study suggested that the MTHFR C677T genetic variant may be associated with a high risk of H-type hypertension, but not for drinking, smoking, age, BMI and blood pressure, in rural community of Anqing, China.
### Methods
Resident old population from communities which has synthetic intervention for hypertension prevention and cure well carried out were enrolled in this study. (1) General state of health: 728 resident old population aged from 65–92, including 320 male (44%) and 408 female (56%), were surveyed and taken a physical examination. (2) Diagnostic criteria: ≥65 was defined as old people according to WHO standard. Hypertension was diagnosed according to Chinese hypertension prevention and cure guide 2010. (3) Blood pressure measurements: examinees were ban of coffee or alcohol drinking since 30 min before examination, and required to no aggravating activities, keep stable mood, empty bladder, and have a 5–10 min resting before examination. Shanghai YuYue desktop mercurial sphygmomanometers licensed and adjusted by national standard department were used to measure blood pressure. Meanwhile, questionnaires survey, other physical examination and blood biochemistry detection were carried out.

### Results
1. 378 in 728 participants had blood pressure achieved or exceeded hypertension diagnostic criteria, with a percentage of 51.6%. 248 in 378 participants with hypertension had known their history of hypertension, with a acknowledge rate of 79.10%. 115 in 248 treated patients were found blood pressure normal in this examination, with a control rate of 53.60%.

2. Relationship between blood pressure control and regular treatment. Blood pressure control was significantly relevant to regular treatment with a p=0.014. Results were showed in table 1.

<table>
<thead>
<tr>
<th>Measured blood pressure</th>
<th>Regular treatment</th>
<th>Total</th>
<th>$\chi^2$ (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Total</td>
<td></td>
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<tr>
<td>Normal</td>
<td>133</td>
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<tr>
<td>Total</td>
<td>248</td>
<td>47</td>
<td>295</td>
</tr>
</tbody>
</table>

*: p<0.05, with a statistical significance.

Owing to the comparison of hypertension and hyperlipidaemia.

Among 728 detected person, there were 248 (34.10%) with high total cholesterol, 274 (37.6%) with high triglyceride, and 66 (9.0%) with low high density lipoprotein, 450 (61.80%) with at least one abnormal of the three blood-fat, 133 (30.67%) with at least two abnormal of the three blood-fat. Hypertension was significantly relevant to hyperlipidaemia with a p=0.010. Results are showed in table 2.

### Table 2 Relationship between hypertension and hyperlipidaemia

<table>
<thead>
<tr>
<th>Hypertension</th>
<th>Hyperlipidaemia</th>
<th>Yes</th>
<th>Total</th>
<th>$\chi^2$ (P)</th>
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</thead>
<tbody>
<tr>
<td>No</td>
<td>151</td>
<td>200</td>
<td>351</td>
<td>6.707 (0.010*)</td>
</tr>
<tr>
<td>yes</td>
<td>127</td>
<td>250</td>
<td>377</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>278</td>
<td>450</td>
<td>728</td>
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</tr>
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</table>

*: p<0.05, with a statistical significance.

### Conclusions
the achievements of synthetic intervention for hypertension prevention and cure in communities in ShenZhen City were noticeable. Respecting the fact that acknowledge rate of hypertension among old people in ShenZhen City achieved 79.1%, regular treatment rate achieved 82.9%, and control rate reached 58.60%, the synthetic intervention for hypertension prevention and cure in communities is worthy of recommended. (2) A considerable proportion in old patients suffered from hypertension combined to hyperlipidaemia, of which high triglyceride was common, with a significant difference between hypertension and non-hypertension old patients ($\chi^2=28.889, p<0.001$). Of several type of blood fat abnormal, mixed type had reached a proportion of 30.67%, while the rate of control was still low, which should be noticed.

ABSTRACTS

#### Objectives
To investigate the relevance and clinical significance of 24 h dynamic blood pressure monitor and left ventricular hypertrophy in hypertension.

#### Methods
From January 2008 to January 2010, 155 patients (76 males and 79 females) with hypertension were investigated. There were 64 examples of grade 1 hypertension, 56 examples of grade 2 hypertension and 35 examples of grade 3 hypertension. Average arterial pressure (SBE, DBP), diurnal systolic pressure (dSBE, nSBE) and diurnal diastolic pressure (dDBE, nDBE) level were collected by dynamic blood pressure monitor. End-diastolic diameter of left ventricle (LVID), end-diastolic left ventricular posterior wall thickness (LVPW), diastolic interventricular septum thickness (IVS) and left ventricular mass index (LVMi) were investigated by echocardiogram.

#### Results
Blood pressure circadian rhythm disappeared (non-scoop type) and left ventricular hypertrophy occurred (LVMi, 138.96 ±10.99 mm) in 48 examples of grade 2 hypertension and 35 examples of grade 3 hypertension. The day and night rule (scoop type) was reserved without LVH (LVMi, 116.13±4.95 mm) in 64 examples of grade 1 hypertension and eight examples of grade 2 hypertension. The night systolic pressure, the night diastolic pressure and the average arterial pressure average value in hypertension with left ventricular hypertrophy were obviously higher than those without LVH (p<0.01). But the day systolic pressures and the day diastolic pressure lever were not obvious difference between two groups (p>0.05).

#### Conclusions
The level of night systolic pressure, night diastolic pressure and average arterial pressure are closely related to left ventricular hypertrophy and non-scoop hypertension is easier to be left ventricular hypertrophy compared with the scoop hypertension.

### Table 1 Relationship between blood pressure control and regular treatment

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</table>

*: p<0.05, with a statistical significance.
Groups cant differences in two or three measures among the four had lower levels of HDL-C, MS, UA in severe OSAS+EH group had higher levels of 2HPINS than those in mild and moderate group (p<0.05). The levels of TG, HDL-C, MS, UA in severe OSAS+EH were higher than in EH. UA in OSAS+EH was higher than in EH. We observed significant differences in two or three measures among the four groups.

Conclusions Hypertensive patients with severe OSAS have more have metabolic disturbances.

GW23-e1505 THE RELATIONSHIP BETWEEN PROTEINURIA AND THE SERUM ALDOSTERONE CONCENTRATION IN ALDOSTERONE-PRODUCING ADENOMA PATIENTS

Ma Xuan, Li Hong-jian, Wang Hong-mei, Wang Meng-hui, Wang Lei, Hu Jun-li, Li Nang-fang. Hypertension Institute of Xinjiang

Objectives To analyse the relationship between 24-h urine protein level and serum aldosterone concentration in aldosterone-producing adenoma (APA) patients.

Methods Data of 32 APA patients who were confirmed by post-operative pathological diagnose were collected in the hypertension department of the people’s hospital of Xinjiang Uygur autonomous region form June 2006 to March 2010. The patients were divided into three groups according to the tertile of serum aldosterone concentration (<14.95 ng/dl, 14.96 ng/dl–24.71 ng/dl and ≥24.72 ng/dl). The 24-h urine protein level of three groups were compared. Furthermore, the relationship between 24-h urine protein level and serum aldosterone concentration were analysed.

Results
1. Compared with the patients in the first (Lg (24-h urine protein level): 0.87±0.28 g/24 h) and the second group (Lg (24-h urine protein level): 1.09±0.27 g/24 h), the patients in the third group (Lg (24-h urine protein level): 1.51±0.50 g/24 h) had higher 24-proteinuria levels (p<0.05).
2. The Pearson correlation analysis showed that 24-h urine protein level was remarkably positively correlated with the serum aldosterone concentration in APA patients. (r=-0.491, p<0.01).

Conclusions The proteinuria of the APA patients was positively correlated with the serum aldosterone concentration.

GW23-e2060 THE ROLE OF A SINGLE-COMPONENT PREPARATION IN COMPLIANCE AND DYNAMIC BLOOD PRESSURE CHANGES IN PATIENTS WITH MILD TO MODERATE HYPERTENSION

Zhaochuan Liu, Junling Wang. Department of Cardiology, No.252 Hospital of PLA, Geriatric Cardiovascular Disease Center of Chinese PLA, Baoding, 071000, China

Objectives To investigate the antihypertensive effect, drug compliance and dynamic blood pressure changes of a single-compound preparation of antihypertensive drugs in patients with mild to moderate hypertension.

Methods 100 patients with mild to moderate hypertension were treated with a single compound antihypertensive drugs (valsartan amlodipine); calcium antagonist with compound of theARB class of antihypertensive drugs. The blood pressure and drug compliance were observed in 8 weeks. 24-h ambulatory blood pressure monitoring was dealt to know the duration of a single-compound antihypertensive drugs and stable blood pressure.

Results 100 patients with mild to moderate hypertension in our hospital were diagnosed clearly, and with the poor effects of our single oral antihypertensive drug or unstable blood pressure. All patients were treated with Amlodipine (5/5 mg), once a day. After 4 weeks of oral valsartan amlodipine compliance, the blood pressure decreased to the standard in 95 cases (95%), not to the standard in three cases (3%), lost to follow-up in 1 cases (1%), and non-compliance by patients in 1 cases (1%). The result of 24-h ambulatory blood pressure monitoring indicated that the average
blood pressure at day and night was normal in 75 cases (78%) after oral valsartan amlodipine during 24 h, dipper blood pressure and non-dipper blood pressure were in 20 cases (20%). After followed-up 8 week, the blood pressure decreased to the standard in 90 of 95 (95%) cases with oral valsartan amlodipine, two cases were lost, three cases were self-replaced drugs. Three cases whose blood pressure was not to standard at followed-up 4 week, were treated with metoprolol tartrate, then their blood pressure decreased. The result of 24-h ambulatory blood pressure monitoring indicated that the average blood pressure at day and night was normal in 80 cases (89%) after oral valsartan amlodipine during 24 h, dipper blood pressure and non-dipper blood pressure were in 10 cases (11%).

Conclusions Calcium antagonists and ARB class of antihypertensive drugs belong to the classic joint programme in the treatment of hypertension, and the composite formulations significantly improve the rate of patient compliance, up to the standard and blood pressure control.

**GW23-e0350**  
**SINGLE-PILL COMBINATION OF TELMISARTAN 80 MG/AMLODIPINE 5 MG PROVIDES SUPERIOR BLOOD PRESSURE REDUCTIONS TO AMLODIPINE 5 MG IN HYPERTENSIVE PATIENTS WHO WERE UNCONTROLLED ON AMLODIPINE 5 MG MONOTHERAPY**

doi:10.1136/heartjnl-2012-302920r.9

1Dingliang Zhu, 2Dayi Hu, 3Jiongjie Chen, 4Chenglei Huang, 1Dingliang Zhu. 1Ruijin Hospital, Shanghai Jiaotong University, China; 2Peking university People’s hospital, Beijing, China; 3Boehringer Ingelheim Intl Trading (Shanghai) Co., Ltd. China; 4Boehringer Ingelheim International Trading (Shanghai) Co., Ltd China

Objectives To investigate the efficacy and safety of the single-pill combination of telmisartan 80 mg plus amlodipine 5 mg (T80/A5 SPC) versus amlodipine 5 mg (A5) in hypertensive Asian patients who were uncontrolled on amlodipine 5 mg (A5) monotherapy (NCT01103960).

Methods Design and Methods After a 6-week open-label run-in period with amlodipine 5 mg monotherapy, patients, who failed to respond adequately to A5 (defined as seated DBP≥90 mm Hg), underwent double-blind randomisation with 160 and 164 patients assigned to receive either T80/A5 SPC or A5 monotherapy daily. The primary endpoint was change from baseline in mean seated trough DBP after 8 weeks of randomised treatment. Treatment groups were compared using an Analysis of Covariance (ANCOVA) model including treatment, country and the baseline measurement as a covariate.

Results In the full population (n=314), seated trough mean±SE BP reductions (mm Hg) with T80/A5 vs A5 from baseline to week 8 were −16.2±1.3 vs −11.7±1.3 for SBP (p<0.001) and −12.4±0.95 vs −10.2 ±0.93 for DBP (p=0.007). T80/A5 provided DBP goal attainment (<140/90 mm Hg) in 64.5% vs 45.3% with A5 alone (p=0.007) and DBP response rate (<90 mm Hg or ≥10 mm Hg reduction) was 80.0% vs 65.3% (p=0.0017). The incidence of related AEs (including peripheral oedema) was low and similar in both treatments group.

Conclusions In Asian patients T80/A5 SPC provided superior BP reductions and goal rate achievement versus A5 monotherapy after 8 weeks of treatment, T80/A5 was well-tolerated and had a safety profile comparable to A5 monotherapy.

**GW23-e2184**  
**THE IMPACT OF RELATION BETWEEN CUFF SIZE AND ARM CIRCUMFERENCE ON BLOOD PRESSURE MEASUREMENT**

doi:10.1136/heartjnl-2012-302920r.11

Xie Dongyang, Cai Jianmei. First Affiliated Hospital of Gannan Medical College, Ganzhou, Jiangxi

Objectives To explore the influence of relation between cuff size and arm circumference on accuracy of blood pressure (BP) measurement.

Methods 300 patients needed for invasive arterial manometry were enrolled. Before operation, invasive and non-invasive BP were measured three times, and got mean BP. Height, weight, upper arm circumference (UAC) were measured, and to calculate body mass index (BMI), mean BP (MBP).

Results The mean UAC was (28.8±3.9 cm) in these 300 patients, and 71.3% patients in this cohort of subjects have UAC greater than 27 cm. Invasive BP measured were higher than those by ordinary cuff non-invasive measurement. With increasing UAC, non-invasive BP readings increased by ordinary cuff, and the difference to invasive BP was greater.

Conclusions Using appropriate cuff-bladder can reduce the pseudo-hypertension incidence in blood pressure measurement.
GW23-e0164  THE CLINIC RESEARCH ON EFFECT OF COMBINED TREATMENT BY BENIDIPINE AND IRBESARTAN ON RENAL FUNCTION IN PATIENTS WITH ESSENTIAL HYPERTENSION

doi:10.1136/heartjnl-2012-302920r.12


Objectives To examine the effect of benidipine and irbesartan used individually or in combination on renal function in patients with essential hypertension (EH).

Methods Sixty-six cases with EH were divided randomly into three groups: benidipine (4 mg qd, n=22), irbesartan (150 mg qd, n=22) and combined treatment (benidipine 4 mg qd+ irbesartan 150 mg qd, n=22). Treatment lasted for 24 weeks. Parameters of renal function were measured before and after treatment.

Results 1. After treatment, urinary albumin excretions were significantly less than those before treatment in all the three groups (urinary albumin excretion mg/24 h, 24 h urine protein g/L, β2-MG, all p<0.01). Magnitude of decrease of urinary albumin excretion in the combined treatment group was higher than those in the benidipine and irbesartan groups (urinary albumin excretion mg/24 h: all p<0.05; 24 h urine protein g/L, b, β2-MG, all p<0.01). No significant difference was found between benidipine and irbesartan groups (p>0.05). After treatment GFR was increased in the combined treatment and perindopril groups, no significant change was observed in the benidipine group (p<0.05, <0.05, and >0.05, respectively).

2. No significant correlation between the magnitude of decrease of urinary albumin excretion and that of SBP or DBP was found among all the three groups (p>0.05).

Conclusions The data suggest that benidipine combined with irbesartan treatment has additive effect on the decrease of urinary albumin excretion and protection of renal function.

GW23-e1137 EXPRESSION OF LYMPHOCYTE KCA3.1 AND CYTOKINE IN SHR

doi:10.1136/heartjnl-2012-302920r.14

Wang Ling-peng, Lu Xian, Department of cardiology of the First Affiliated Hospital, Xin Jiang Medical University.

Objectives To research the expression of intermediate-conductance Ca2+-activated K+ channel (KCa3.1), TNF-α mRNA and protein in lymphocyte derived from spontaneously hypertensive rat (SHR).

Methods Take SHR and Wistar rats as experimental animals, to separate peripheral blood lymphocytes in rats, using Real-time PCR and Western blot technique were used to detect the express of KCa3.1, TNF-α in SHR lymphocytes.

Results (1) In SHR, the expression of KCa3.1 gene was significantly higher in lymphocytes (1.30±0.2117 vs 0.447±0.2012, p<0.05) compared with Wistar rats. The expression levels of TNF-α mRNA in the SHR lymphocytes were significantly increased compared with the control group (1.4257±0.1317 vs 0.3836 ±0.1626; p<0.05).

(2) KCa3.1, TNF-α protein expression were also increased in SHR than in control (p<0.05).

Conclusions The lymphocyte KCa3.1, TNF-α expression are upregulated in SHR suggesting Kcα channel may contribute to the development of hypertension by lymphocyte activation.

GW23-e1527 CLINICAL CHARACTERISTICS OF 224 CASES WITH NORMOKALEMIC AND HYPERTENSIVE PRIMARY ALDOSTERONISM

doi:10.1136/heartjnl-2012-302920r.13

Li Hong-jian, Wang Meng-hui, Wang Hong-mei, Kong Jian-qiong, Li Nanfang, Hypertension Institute of Xinjiang.

Objectives To investigate the clinical characteristics of patients with normokalemic and hypertensive primary aldosteronism.

Methods The clinical data of 224 cases with normokalemic and hypertensive primary aldosteronism from 2006 to 2010 in the hypertension department of the people’s hospital of Xinjiang Uygur autonomous region were analysed retrospectively. Primary aldosteronism was diagnosed by aldosterone-to-rennin activity ratio(ARR) screening and confirmation tests(including Captopril challenge test and sodium infusion test).

Results The prevalence of 1, 2 and 3 stage hypertension in all subjects were 4.47%, 18.3% and 77.23%, respectively. The main symptoms were headache (52.07%), dizzy (49.7%), fatigue (4.14%), palpitation (2.98%), limbs numbness (1.78%), respectively. The average serum sodium level was (140.75±2.75) mmol/l. The incidence of hypernatremia was only 4.91%. The proportion of the patients with normokalemic and hypertensive primary aldosteronism who had the renin activity of less than 1 ng·ml⁻¹·h⁻¹ was 97.52%. To screen the patients with normokalemic and hypertensive primary aldosteronism, the diagnostic positive rate of ARR≥20 (ng/dl)/[μg/(L·h)]combined with low renin activity was significantly higher than that of the low renin activity combined with high aldosterone level, ARR ≥20 (ng/dl)/[μg/(L·h)] combined with high aldosterone level and ARR≥20 (ng/dl)/[μg/(L·h)] as a screening standard (χ²=18.95, p<0.001; χ²=31.13, p<0.001; χ²=29.25, p<0.001).

Conclusions The majority present moderate to severe hypertension with low renin activity and normal serum sodium level in normokalemic and hypertensive primary aldosteronism patients. Cerebral vascular complication is relatively more common than coronary heart disease. It is helpful to decrease the missed diagnosis rate for ARR combined with low renin activity as a screening index of the patients with normokalemic and hypertensive primary aldosteronism.

GW23-e1534 THE RELATIONSHIP BETWEEN EARLY BLOOD PRESSURE VARIABILITY AND SHORT-TERM PROGNOSIS IN SEVERE TRAUMATIC BRAIN INJURY PATIENTS

doi:10.1136/heartjnl-2012-302920r.15

Chen Hui, Wu Xiaoying, Chen Hui, Fujian Provincial Cardiovascular Disease Institute.

Objectives To study the correlation of early blood pressure variability and short-term prognosis in severe traumatic brain injury patients without previous hypertension history.

Methods 107 patients with severe traumatic brain injury were analysed retrospectively in our hospital from January 2007 to March 2011. The mean blood pressure, blood pressure variability (SD, coefficient of variability; SD/mean) in those with comatose (GCS 3–5) during the first 24 h after trauma were investigated in 3 days after operation and Glasgow Outcome Scale were evaluated after 6 months. According to the Glasgow Outcome Scale, all the patients were divided into two groups, Group A, good prognosis (GOS 1–3)and Group B, poor prognosis (GOS 4–5).
Results
1. There were older ages, lower GCS and APACHE II Scale, higher SD (SD) of systolic pressure and diastolic pressure and higher coefficient of variability (CV) of systolic pressure within 72 h in Group A than those in Group B (p<0.01).

2. Logistic regression analysis revealed that: (1) lower APACHE II Scale, type of traumatic brain injury and higher coefficient of variability (CV) of systolic pressure within 72 h were risk factors for prognosis in Model One. The ROC Curve revealed that the cut-off value for CV of Sp was 0.1146; the correct index, sensitivity and specificity were 69.3%, 80.6% and 88.7%. (2)lower APACHE II Scale, type of traumatic brain injury and higher SD of systolic pressure within 72 h were risk factors for prognosis in Model Two. The ROC Curve revealed that the cut-off value for SD of Sp was 14.1320; the correct index, sensitivity and specificity were 72.0%, 83.3% and 88.7%.

Conclusions The old age, low APACHE II Scale, type of traumatic brain injury and high systolic pressure variability are the risk factors for prognosis in severe traumatic brain injury and higher SD of systolic pressure within 72 h would suffer from poorer prognosis.

GW23-e0143
THE CHANGES OF PLASMA RENIN AND ALDOSTERONE LEVELS IN RESISTANT HYPERTENSION PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA SYNDROME BEFORE AND AFTER CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY
doi:10.1136/heartjnl-2012-302920r.16
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Objectives To investigate the changes of plasma renin and aldosterone one levels before and after continuous positive airway pressure (CPAP) therapy in resistant hypertension patients with obstructive sleep apnoea syndrome.

Methods The randomised controlled trials were retrieved from the databases MEDLINE, EMBASE, BIOSIS Previews and CNKI up to June 2011. In total 3 studies and 33 patients were selected. The selected research studies were analysed using the statistical software Revman 5.1.

Results The changes of plasma renin levels before and after CPAP therapy showed no significant difference (Std. Mean Difference = −0.85, 95% CI −2.02 to 0.32], p=0.15). The changes of plasma aldosterone levels before and after CPAP therapy also showed no significant difference (Std. Mean Difference=0.05, 95% CI −2.46 to 2.56, p=0.97).

Conclusions There were no significant changes of plasma renin and aldosterone one levels before and after CPAP therapy in resistant hyper tension patients with obstructive sleep apnoea syndrome.

GW23-e1015
CALCIUM ANTAGONIST COMBINED WITH STATIN THERAPY ON PLASMA INFLAMMATORY MEDIATORS IN PATIENTS WITH HYPERTENSION AND CAROTID ATHEROSCLEROSIS
doi:10.1136/heartjnl-2012-302920r.18
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Objectives To investigate the effect of calcium antagonists (CCB) and statins on carotid plaques and plasma inflammatory mediators, so as to learn the possible mechanism of their anti-atherogenic effect.

Methods This is a cross-sectional study. Laboratory tests and carotid ultrasound examination were performed in patients with essential hypertension. All patients were divided into three groups, who were treated with CCB or statins monotherapy or CCB and statins combination therapy respectively. Laboratory parameters included plasma low-density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), high-sensitivity C-reactive protein (hsCRP), the medulla metalloproteinase 9 (MMP9) and the lipoprotein-associated phospholipase A2 (Lp-PLA).

Results Baseline conditions Total 150 patients with essential hypertension were enrolled in, among them 78 (52.0%) were male and 72 (48.0%) were female. Within the male group, 79.6% (62/78) were at risk for coronary artery disease (CAD) and 82.1% (73/88) in female group. Lipid profile data were 2.00±2.50 in high-density lipoprotein cholesterol (HDL-C), 7.49±2.27 in low-density lipoprotein cholesterol (LDL-C), 2.61±0.78 in triglyceride (TG), 1.81±1.11 in total cholesterol (TC), 1.39±0.30 in apolipoprotein B (ApoB) and 1.25±0.30 in apolipoprotein A1 (ApoA1).

GW23-e1506
THE EFFECT OF OBESITY ON DETECTION RATE OF OBSTRUCTIVE SLEEP APNOEA-HYPOPNOEA SYNDROME IN HYPERTENSIVE PATIENTS
doi:10.1136/heartjnl-2012-302920r.17
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Objectives To investigate the detection rate of obstructive sleep apnoea-hypopnoea syndrome (OSAHS) in hypertensive patients and the influence of obesity on it.

Methods A total of 825 in patients with hypertension were derived from a sampling of the population who visited hypertensive clinic in People’s Hospital of Xinjiang Uygur Autonomous Region from April 1 to June 30 in 2009. They were asked to answer the questions concerning snoring, daytime sleepiness, or undergone physical examination. The subjects with loud snoring and daytime sleepiness, who with tubbiness neck, retrogrenathia, enlarged tongue, orolingual cyanosis accompany or not, were selected to undergo polysomnography for a whole night. OSAHS is defined as apnoea-hypopnoea index(AHI) not less than 5 per hour and accompanied with clinical symptoms.

Results
1. The detection rate of OSAHS in hypertension was 23.52% (178/220), while 34.34% (148/431) in males and 11.68% (46/394) in females respectively.

2. Grouping by body mass index(BMI), the detection rate were 6.6% (12/183) in subjects with normal weight, 22.22% (78/351) in overweight subjects and 36.75% (104/283) in obesity subjects with significant difference(X^2=56.736, p<0.01). The severe OSAHS rate (16.61%) in obesity group was significantly higher than that in normal weight group (2.19%) and overweight group (7.69%) (X^2=29.219, p<0.01).

3. Grouping by waist circumference, the OSAHS rate were 7.83% (9/115) in normal group and 26.29% (184/700) in centricity obesity (X^2=19.623, p<0.01). The severe OSAHS rate was 2.61% (3/115) in normal group and 10.57% (74/700) in centricity obesity (X^2=7.32, p<0.01).

4. The moderate to severe OSAHS rate was increased with BMI in female patients (X^2=5.846, p<0.05). It was increased with BMI and waist circumference in males (p<0.01).

Conclusions The detection rate of OSAHS in hypertension was higher. Obesity maybe one of the important factors for OSAHS.
72 (48.0%) were female. Thirty-nine patients complicated with diabetes mellitus, accounting for 26.0%. Thirty-six patients complicated with hyperlipidaemia, accounting for 16.0%. The mean age was 59.06 years and the mean blood pressure was 140.21/84.73 mmHg.

**Comparison Analysis of Plasma Lipids and Inflammatory Parameters**

Compared with patients who were not treated with statins, patients treated with statins had lower total cholesterol and LDL-C levels. The plasma levels of Lp-PLA$_2$, MMP9 and hsCRP were similar in patients treated with different drugs, the difference was not statistically significant.

**Correlation Analysis between Inflammatory Status and Carotid Atherosclerosis**

Pearson correlation analysis showed that Lp-PLA$_2$ content was linearly correlated with hsCRP levels, the correlation coefficient was 0.282, p=0.001. But MMP9 content was not correlated with hsCRP levels, the correlation coefficient was 0.107, p=0.213. Compared with patients without carotid plaques, patients with soft carotid plaques had higher plasma content of hsCRP and Lp-PLA$_2$, the difference was statistically significant by ANOVA analysis. MMP9 content was relatively lower in patients with soft carotid plaque, but the difference was not statistically significant.

**Conclusions**

1. Plasma LP-PLA$_2$ content, which was positively correlated with plasma hsCRP level, can reflect the body’s inflammatory state better than that of MMP9.
2. Patients with soft carotid plaques had higher plasma level of LP-PLA$_2$, which suggested that the LP-PLA$_2$ level can reflect the stability of plaques.
3. The difference of inflammatory parameters in different groups was not statistically significant.

**GW23-e1046**

**CLINICAL ANALYSIS OF 62 CASES OF AORTIC DISSECTION MISDIAGNOSED**

**Objectives**

62 aortic dissection misdiagnosis cases’ Clinical data and misdiagnosed the reasons having been analysed, To improve the level of diagnosis of the disease and reduce misdiagnosis.

**Methods**

It had been retrospectively analysed 89 hospitalised patients (included The first misdiagnosis of 62 cases of patients) with aortic dissection’s clinical data about symptoms, signs, risk factors, electrocardiogram, cardiac enzymes, chest X-ray or regular CT, echocardiography, aortic CTA or MRA and other clinical data from January 2009 to December 2010 in the Department of Cardiology in our hospital.

**Results**

In 89 cases, there are 62 patients misdiagnosis, Approximately 70% of the rate of misdiagnosis; The first misdiagnosis of acute coronary syndrome are 49 cases, Hypertension and acute left heart failure are two cases, lung infection are 4 cases, cerebral vascular accident is 1 case, abdominal disease six cases; It is About 90% of patients with hypertension, 82% of patients with chest pain, 80% of patients have ECG abnormalities, 100% of the patients diagnosed by aortic CTA or MRA.

**Conclusions**

Patients with aortic dissection need to be early diagnosis in a timely and to choice right-imaging studies on clinical, and to be guide treatment options. Taking effective treatment can significantly reduce mortality.

**GW23-e1508**

**ANALYSING THE RELATIVE FACTORS THAT INFLUENCE GLOMERULAR FILTRATION RATE IN PRIMARY ALDOSTERONISM.**

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**Objectives**

TO analyse the risk factors related to low glomerular filtration rate (GFR) in aldosteronism and to comparing the value of glomerular filtration rate between patients with primary aldosteronism and with essential hypertension.

**Methods**

189 patients with PA were included in this study. The value of GFR was caculated by MDRD equation, Clinical characteristics, such as the concentration of plasma aldosterone, triglycerides, plasma basic glucose et al were assessed in 198 PA patients and 198 matched controls with EH. The duration of disease, body mass index, blood pressure, concentration of creatinine, GFR and Cystatin C protein of two groups were studied by two independent samples T test. Regression analysis were used to find the risk factor of PA that influenced GFR.

**Results**

1. both of plasma the concentration of creatnine and Cystin protein in PA are higher than EH group (p<0.001); eGFR was significant higher in EH patients than PA patients(p<0.001), and Plasma aldosterone was lower in EH patients(p<0.05).
2. 24-h urine albumin excretion wrer studied by nonparametric test the rust shows 24-h urine albumin excretion of PA group is higher than EH group.(p<0.05)By multiple regression analysis, we obtain equation Y=420.28-53.33 Xcystatin C-21.9X 24-h urine albumin-0.55X the concentration of plasma aldosterone-1.77X the concentration of plasma sodium. The equation suggest that cystatin C, 24-h urine albumin excretion, the concentration of plasma aldosterone and the concentration of plasma sodium are independently predictors of GFR (p<0.05).

**Conclusions**

the results suggest that cystatin C, 2 4-h urine albumin excretion, the concentration of plasma aldosterone are
risk factor of GFR. The renal damage is more serious in PA patients.

**ACKNOWLEDGEMENT STATUS OF GENERAL PRACTITIONER IN XINJIANG ON PREVENTION AND TREATMENT OF HYPERTENSION**

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**Objectives** To investigate the acknowledgement status of general practitioner in Xinjiang on primary knowledge of prevention and treatment of hypertension and provide a reference for further training.

**Methods** Closed book written survey on hypertension knowledge was assessed in 782 general practitioners from different levels of hospitals in the seven major regions of Xinjiang, including Hetian, Kurle, Ili and etc.

**Results**
1. The rate of correct answer to target organ damages, risk factors of hypertension and aim of blood pressure control in different subgroups was significantly lower in practitioners from South Xinjiang than that from North Xinjiang (p<0.001), except for the diagnostic criteria of hypertension;
2. The correct answer rates to the heart, kidney, vascular damage caused by hypertension, risk factors of hypertension (lack of physical exercises) were found in practitioners from Hetian were significantly lower than in other regions (p<0.05). Only 50.8% of general practitioners in Kurle correctly answer the aim of blood pressure in elderly population.
3. The acknowledge status were the best in practitioners from third-grade hospital, only 70.4% practitioners from second-grade hospital knew the final aim of blood pressure control in elderly hypertensive patients.
4. More male practitioners than female practitioners gave the correct answers to vascular damage (95.2% vs 85.4%, p=0.001), excessive alcohol intake (92.9% vs 86.7%, p=0.006) and the final aim of blood pressure control in hypertensive patients combined with diabetes or renal damages (95.5% vs 87.7%, p=0.008).
5. The attending physicians had the lowest rate on the items of ‘aim of blood pressure control in different sub-populations’ (p=0.019).

**Conclusions** Training on prevention and treatment of hypertension in general practitioner must focus on south Xinjiang, strengthening to know the hypertension knowledge comprehensively and correctly.

**THE EFFECTS OF ANGIOTENSIN-II RECEPTOR BLOCKER ON PULSE VELOCITY IN PATIENTS WITH HYPERTENSION: A META-ANALYSIS**

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**Objectives** Our purpose was to evaluate the effect of angiotensin-II receptor blocker on peripheral arterial stiffness in patients with hypertension. What’s more, we also made a comparison between ARB and other kinds of drugs.

**Methods** We searched the trials, which studied the effect of ARB on PWV in the database of Medline, Embase, Clinical evidence online, Socolar searching platform, China National Knowledge Infrastructure, VIP Database and Wanfang Database. The including trials underwent heterogeneous test, metaanalysis and publication bias test.

**Results** 10 clinical trials were included. After medication of ARB, the PWV was 1.11 m/s lower than that before medication (95% CI: 0.55 to 1.70, p=0.0002), which was also 0.38 m/s lower than that after medication of calcium-channel blocker, CCB (95% CI −0.53 to 0.22, p=0.28). The including trials exist heterogeneity and publication bias.

**Conclusions** ARB had the effects of reducing PWV on patients with hypertension and it is similar to that of CCB. The result of our study showed that ARB had the effect of anti-atherosclerosis.

**THE RELATION OF SERUM HIGH-SENSITIVE C-REACTIVE PROTEIN TO RISK FACTORS AND TARGET-ORGAN DAMAGE IN HYPERTENSIVE PATIENTS**

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**Objectives** To provide a theoretical basis for evaluating the severity and prognosis of hypertension, we explore the relation of high-sensitive c-reactive protein (hs-CRP) to risk factors and target organ damage in hypertensive patients.

**Methods** Serum hs-CRP concentration of 216 hypertensive cases and 36 healthy subjects were tested. They were divided into different groups according to the associated diseases, the number of involved target organ and the difference of involved target organ. Hs-CRP and other variables such as TC, TG, LDL-C, BUN, Cr, FPG, IVMI, SBP and DBP were compared. The relativity between variables such as TC, TG, LDL-C, BUN, Cr, FPG, IVMI, SBP and DBP and hs-CRP was analysed by using of linear correlation analysis and multiple linear regression analysis.

**Results** Hypertensive patients had significantly higher of hs—CRP concentration (1.99±0.54) mg/l than healthy subjects (1.1±0.26) mg/l. The hs-CRP levels in hypertensive patients complicated with CHD group [(2.39±0.24) mg/l] were higher than those complicated with diabetes mellitus (2.1±0.18) mg/l) than those merely hypertension (1.85±0.30) mg/l). Correlation analysis showed hs-CRP levels had a positive correlation with the number of damaged target-organ. Following damaged target-organs increased, hs-CRP levels also gradually increased. The correlation coefficient was 0.747 (p<0.01). Hs-CRP in left ventricular hypertrophy group (1.96±0.15) mg/l) was significantly higher than carotid atherosclerosis (1.79±0.18) mg/l) and renal injury group [(1.81±0.17) mg/l], and carotid atherosclerosis and renal injury group was higher than retinopathy group [(1.65±0.28) mg/l] (p<0.01). Hs-CRP was positively correlated with age, SBP, DBP, TG, TC, LDL-C, BUN, Cr and IVMI, and negatively correlated with HDL-C. Stepwise regression analysis showed that the dominated factors of hs-CRP concentrations levels were left ventricular mass index, HDL-C and age. The Regression equation was: y=1.276+0.007a−0.397b+0.007c, y representing of logarithmic after transformation of hs-CRP, a representing of left ventricular mass index, b representing of HDL-C, c representing of the age.

**Conclusions** Hs-CRP levels of hypertensive patients were significantly higher than healthy subjects. The more number of involved target organ, the higher serum hs-CRP levels were. Patients with different involved target organ had different inflammatory degree, which hypertensive patients with LVH had the highest hs-CRP.
levels while retinopathy group had the lowest. Hs-CRP was positively correlated with age, SBP, DBP, FPG, TG, TC, LDL-C, BUN, Cr and LVMI, and negatively correlated with HDL-C. Stepwise regression analysis showed that the dominated factors for hs-CRP levels were LVMI, HDL-C and age.

**Paediatric cardiology**

**GW23-e1076**  
**THE CLINICAL SIGNIFICANCE OF SERUM LEVELS OF CK-MB AND CTN-I COMBINED WITH CORRECTED QT DISPERSION TO EVALUATE THE SEVERITY OF MYOCARDIAL INJURY AFTER ASPHYXIA IN NEONATES**

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**Objectives** Hypoxic ischaemic myocardial injury is one of the serious complications of asphyxia in neonates, which may cause systolic dysfunction, arrhythmias, heart failure and even death. Early and accurate diagnosis may direct the appropriate treatments. The aim of this study was to investigate the significance of serum level of creatine kinase-MB (CK-MB) and cardiac troponin-I (cTnI) combined with corrected QT dispersion (QTCD) to evaluate the severity of post-asphyxial myocardial injury in neonates.

**Methods** We enrolled 52 neonates in asphyxia group (38 in mild asphyxia group and 14 in severe asphyxia group) and 30 neonates in control group. There were no significant differences among the three groups in terms of gestational age, birth weight, gender, and age. Serum levels of CK-MB and cTnI were detected by enzyme linked immunosorbent assay (ELISA) and immunodepression and QTCD were calculated by 12-lead electrocardiograms (ECG) at the 1st–3rd day after birth in asphyxia and control groups and 7th–10th day after birth in asphyxia group respectively. Data were statistically analysed using SPSS 13.0 software.

**Results** Before treatment, the serum levels of CK-MB were 201.0 ±102.80, 281.21±163.78 and 22.0±6.69 (U/L), cTnI were 1.13±0.40, 2.67±0.60 and 0.30±0.17 (ng/ml) and QTCD were 62.22±50.37, 76.24±27.72 and 38.44±21.76 (ms) in mild asphyxia, severe asphyxia and control group respectively (p<0.01). The serum levels of CK-MB and cTnI and QTCD values in mild and severe asphyxia group were higher than those in control group. After treatment, the serum levels of CK-MB were 38.74±18.08 and 52.93±40.61 (U/L), cTnI were 0.37±0.19 and 0.98±0.22 (ng/ml) and QTCD were 41.82±20.42 and 54.40±31.43 (ms) in mild asphyxia, severe asphyxia and control group respectively (p<0.01). The differences of CK-MB and cTnI levels and QTCD values before treatment, the CK-MB and cTnI levels and QTCD values after treatment, the CK-MB level, cTnI level and QTCD level combined with corrected QT dispersion (QTCD) were statistically analysed using SPSS 13.0 software.

**Conclusions** Serum levels of CK-MB and cTnI and QTCD values were increased in neonates with asphyxia, which may indicate the myocardial injury. cTnI is a better index to evaluate the severity of myocardial injury after asphyxia than CK-MB and QTCD. CK-MB level has high sensitivity while QTCD value has high specificity. CK-MB and cTnI level combined with QTCD might increase the diagnostic accuracy of myocardial injury after asphyxia in neonates.

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**ABSTRACTS**

**GW23-e0515**  
**STRUCTURAL AND FUNCTIONAL CHANGES OF CORONARY ARTERY IN ELDERLY SENILE PATIENTS WITH ESSENTIAL HYPERTENSION**

Hu Jun, Zhu Fu. Shanghai Xuhui Central Hospital.

**Objectives** To evaluate the effect of aging on the changes of structure and function of artery in elderly senile patients with essential hypertension.

**Methods** Aged 80 or above are the very elderly, aged 60 or above and below 80 are the elderly. Patients were divided into very elderly with hypertension (Group I, 84 cases), very elderly without hypertension (Group II, 18 cases), and elderly with hypertension (Group III, 48 cases). All above 132 cases hypertensive patients were divided according to duration of hypertension into four sub-groups: Group A: >0 and ≤10 years (29 cases), >10 and ≤20 years (52 cases), >20 and ≤30 years (44 cases), >30 and ≤40 years (27 cases). All those patients were tested the following index by 64 coronary CT scan: right coronary artery calcification score (CSLRCA), left coronary artery calcification score (CSLLCA), left anterior descending coronary artery calcification score (CSLAD), left circumflex coronary artery calcification score (CSLCX); the total coronary calcification score (TCS). The 24 h systolic blood pressure (24 h SBP) were measured by using ambulatory BP monitoring (ABPM).

**Results** The value of 24 h SBP, smoking ratio, FPG, HbA1c, TG between the Group I and Group III is higher than in Group II (p<0.01), no difference with age and HDL in Group I (p>0.05). The CSLRCA, CSLAD, TCS and PP, as well as CSLAM, CSLCX and PP were significantly increased in Group I than those in Group III (p<0.01 and p<0.05, respectively), but no difference with CSLCA. The level of 24 h SBP of Group I is higher than in Group II (p<0.01), no difference in age, smoking persons, BMI, TC, HDL, LDL, FPG, HbA1 (p>0.05). There were no significant differences in CSLRCA, CSLAM, CSLAD, CSLCX, TCS between Group I and Group II (p>0.05). It was the same with IMT levels in 5 groups (p>0.05). The TCS level was positively correlated with the duration of hypertension in elderly hypertensive patients (r=0.160, p=0.036). The level of 24 h SBP is positively correlated with the duration of hypertension (r=0.223, p=0.003) as well. But there was no correlation between PP level and the duration of hypertension (r=0.138, p=0.072).

**Conclusions** In elderly patients, accompany aging, there may be a decreasing trend in the levels of BMI, HDL, TC and LDL. Meanwhile, the decline of arterial compliance and increase of arterial stiffness developed with aging. Aging is more likely lead to atherosclerosis in coronary artery, especially in the left main coronary and its main branches. Aging is a uncontrolled risk factor, which had played an crucial role in coronary artery atherosclerosis. Therefore, it is a priority to anti-oxidise and prevent senility.
GW23-e0123 INTRAVENOUS SOTALOL FOR INCESSANT TACHYARRHYTHMIAS IN CHILDREN

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Objectives To investigate the effects and safety of intravenous sotalol to treat paediatric incessant tachyarrhythmias with normal cardiac function.

Methods 19 children (age 2.0±2.3 years) presenting incessant tachyarrhythmias were treated with intravenous sotalol (dose 5 mg/kg.d). To investigate the efficacy: the duration between start of iv sotalol to the point of reversion to sinus rhythm and whether sinus rhythm could be maintained. Blood pressure, heart rate and rhythm were closely monitored during drug use, QTc and PR interval were measured after drug use.

Results Totally 14 patients (73.3%) were successfully reversed to sinus rhythm during 24 h of iv sotalol. Duration between start of iv sotalol to reversion of sinus rhythm is 5.3±9.3 h (0.05–24 h), 9 patients were diagnosed as atrioventricular reentrant tachycardia, 7 of them reversed to sinus rhythm (77.8%), duration 28.7±17.3 min (3–50 min). 6 patients were diagnosed as incessant atrial tachycardia, 4 of them reversed to sinus rhythm (66.7%), duration 4.8±7.5 h (0.5–16 h). 5 patients were diagnosed as incessant atrial flutter, 2 of them reversed to sinus rhythm (66.7%), duration 23–24 h. 1 patient diagnose as idiopathic ventricular tachycardia originated from left mid-posterior septum reversed to sinus rhythm after 1 h of iv sotalol. Obvious QTc prolongation was detected in 2 patients after iv sotalol (486–500 ms), iv sotalol was withdrawn and oral sotalol was added, QTc reversed to normal range after 1 month for both of them. No torsade de points or other arrhythmias associated with iv sotalol were detected during drug use.

Conclusions Intravenous sotalol can be safely and effectively used for paediatric tachyarrhythmias with normal cardiac function. No iv sotalol associated arrhythmias or toxicity were detected. Monitoring of QTc is required during iv sotalol.

Clinical Analysis of III Atrioventricular Block and Shock Caused by Acute Pancreatitis

Guo Haiping, Hou Congcong. PLA 264 Hospital

Objectives Acute pancreatitis is very common, but in this case typical symptoms such as acute and persistent abdominal pain did not occur. The first complaint was syncope, III atrioventricular block, shock. Such cases are reported as follows

Methods Case: Female patient, 29 years old, was admitted into the emergency department. Chief complaint: Intermittent nausea for 10 years. Li Hongtao reported 1 case of patient with acute pancreatitis associated with arrhythmias. This patient symptoms of acute pancreatitis were not typical. Amylase of blood and urine were normal. Myocardial enzymes, liver enzymes were abnormal, serum amylase was checked again after admission: 141 U/L; Abdominal ultrasound: Gallbladder wall thickness and peritoneal effusions. We performed abdominal paracentesis and drew 200 ml ascites which was pink and clear. Ascites routine: Leukocyte 50/ul, Red blood cells 4750/ul, Albumin 41.9 g/l, Rivolta++, Proportion 1.015. All the data showed it was bloody exudative fluid. Emergency Abdominal CT: The head of the pancreas was slightly plump, surrounded by exudative lesions, possibly pancreatitis. The right kidney volume increased with slightly higher density of internal capsule, bilateral pleural effusion, gallbladder wall thickening with exudation surrounding, possibly cholecystitis, Ascites. Blood routine: Leukocyte 16.55×10⁹/l, Neutrophils 14.57×10⁹/l, Red blood cell 4.46×10¹²/l, Hb129 g/l, PLT185×10⁹/l; Myocardial enzymes: Aspartate aminotransferase 335 U/L, Lactate dehydrogenase 308 U/L, ß-hydroxybutyrate dehydrogenase 495 U/L, Creatine kinase 538 U/L, Creatine kinase isoenzyme 61 U/L; blood glucose: 10.61 mmol/l; blood calcium 2.01 mmol/l; renal function: Urea 11.33 mmol/l, liver function: total Bilirubin 32.4 µmol/l, direct bilirubin 9.9 µmol/l, indirect bilirubin 22.5 µmol/l, Alanine aminotransferase 106 U/L; Amylase(77 U/L. Corrected diagnosis: 1. Severe acute pancreatitis third degree atrioventricular block Adam-Stokes syndrome, 2. Septic shock 3. Cholecystitis. Given temporary pacemaker, fluid infusion, anti-shock treatment, anti-pancreatic exocrine, anti-inflammatory treatment, bedside ultrasound, ventilator-assisted breathing and supporting treatment, condition gradually improved and she discharged from hospital 4 weeks later.

Results The patient was young women, 29 years old, without acute, persistent abdominal pain etc she was identified as III Atrioventricular block, syncope, shock- clinical symptoms of cardiovascular diseases, which was very dangerous and progressed very fast. Multi system failure came out soon and this kind of patients suffered a high mortality, and was difficult to save. There was no report on acute pancreatitis complicated by ‘III Atrioventricular block,’ for 10 years. Li Hongtao reported 1 case of patients with acute pancreatitis associated with arrhythmias, 50% of them ECG showed: ST-T segment change, II atrioventricular block, mainly premature ventricular contractions, among them, the mortality of those who was associated with ST-T segment change was higher. Chen Jinsong [3] reported 1 case of patient with acute pancreatitis associated with tachyarrhythmias, HR 165 bpm, Complete right bundle branch block. The tachyarrhythm cannot be terminated by drug or oesophageal pacing and the patient died after 4.5 h. Such reports showed that acute pancreatitis associated with tachyarrhythmias are more common than those associated with slow arrhythmias. The mortality of acute pancreatitis associated with arrhythmias is high.

Conclusions This patient symptoms of acute pancreatitis were not typical. Amylase of blood and urine were normal. Myocardial enzymes, liver enzymes were abnormal, Chest X-ray: Heart shadow did not enlarge, Echocardiography: EF Left ventricular internal diameter were normal, Pleural effusion and ascites cannot be explained by acute severe myocarditis. Thus we need to broaden our insights, and

GW23-e1122 CLINICAL ANALYSIS OF III ATRIOVENTRICULAR BLOCK AND SHOCK CAUSED BY ACUTE PANCREATITIS

Guo Haiping, Hou Congcong. PLA 264 Hospital

Objectives Acute pancreatitis is very common, but in this case typical symptoms such as acute and persistent abdominal pain did not occur. The first complaint was syncope, III atrioventricular block, shock. Such cases are reported as follows

Methods Case: Female patient, 29 years old, was admitted into the emergency department. Chief complaint: Intermittent nausea for 10 years. Li Hongtao reported [1]: 85 cases of hospitalised patients with acute pancreatitis associated with arrhythmias, 50% of them ECG showed: ST-T segment change, II atrioventricular block, mainly premature ventricular contractions, among them, the mortality of those who was associated with ST-T segment change was higher. Chen Jinsong [3] reported 1 case of patient with acute pancreatitis associated with tachyarrhythmias, HR 165 bpm, Complete right bundle branch block. The tachyarrhythm cannot be terminated by drug or oesophageal pacing and the patient died after 4.5 h. Such reports showed that acute pancreatitis associated with tachyarrhythmias are more common than those associated with slow arrhythmias. The mortality of acute pancreatitis associated with arrhythmias is high.

Conclusions This patient symptoms of acute pancreatitis were not typical. Amylase of blood and urine were normal. Myocardial enzymes, liver enzymes were abnormal, Chest X-ray: Heart shadow did not enlarge, Echocardiography: EF Left ventricular internal diameter were normal, Pleural effusion and ascites cannot be explained by acute severe myocarditis. Thus we need to broaden our insights, and
VALUE OF 3D SPECKLE TRACKING ECHOCARDIOGRAPHY IN DETECTING LEFT VENTRICLE REMODELLING AND CARDIAC DYSFUNCTION IN PATIENT WITH AORTIC VALVULAR DISEASES

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Objectives Aortic valvular disease is a very common cause of heart failure and cardiac death. Non-invasive assessment of early stage cardiac dysfunction caused by aortic valvular diseases is of great diagnostic and prognostic importance. In this study, we aim to investigate the value of the state-of-the-art three-dimensional speckle tracking echocardiography (3DSTE) in detecting left ventricle (LV) remodelling and early stage cardiac dysfunction.

Methods Sixty-nine patients with aortic valvular diseases and NYHA heart function class I or II as well as 48 age matched healthy controls were recruited. All patients received conventional echocardiography. Furthermore, real-time three-dimensional echocardiography (RT3DE) images were recorded and 3DSTE were performed using a commercial available ultrasound diagnostic system (Vivid E9, GE Vingmed Ultrasound, Chicago, US). The 3DSTE allows rapid semi-automatic measurement of longitudinal strain (LS), circumferential strain (CS), radial strain (RS), and a novel area strain (AS) which represent the recline of surface area of LV during contraction. Besides, LV EF and LV mass can also be measured during 3D strain analysis.

Results Patients with aortic valvular diseases have significantly lower LV EF (54.5% vs 62.4%, p<0.001) and higher LV mass index (117.3 g/m² vs 82.2 g/m², p<0.001) than control. Other clinical characteristics including age, sex, heart rate are comparable between two groups (p>0.05). As for the strain derived parameters, global LS (~15.9% vs ~19.3%, p<0.001), RS (46.4% vs 54.0%, p=0.003) and AS (~28.5% vs ~33.3%, p=0.001) are significantly lower in aortic valvular disease group. There’s no significant difference in CS between two groups (~17.4% vs ~18.5%, p=0.134).

To investigate if the pressure and volume overload have differential impact on LV deformation, patients with aortic valvular diseases were further divided into aortic stenosis and aortic regurgitation sub-groups (n=39 and 30 respectively). One-way ANOVA showed all four strain parameters were different among the three groups (LS, p<0.001; CS, p=0.024; RS, p=0.013; AS, p=0.004). LSD multiple comparison showed that although LS is significantly lower in both aortic stenosis and aortic regurgitation group compared with healthy controls, the most dramatic change is seen in stenosis group (Stenosis vs Control: ~14.5% vs ~19.3%, p<0.001; Stenosis vs Regurgitation: ~14.5% vs ~16.9%, p=0.010). This result is consistent with previous reports that LS is the most sensitive parameter for sub-clinical heart dysfunction. As for the CS, there’s no significant difference between stenosis and control group (~18.3% vs ~18.5%, p=0.338). CS impairment were only seen in aortic regurgitation patients (Regurgitation vs Control: ~16.2% vs ~18.5%, p=0.022). Area strain and RS are decreased in both aortic stenosis and regurgitation patients, but there’s no difference between two sub-groups.

Conclusions 3DSTE are useful to detect early stage heart dysfunction caused by aortic valvular diseases. LS is most vulnerable to pressure overload caused by aortic stenosis while CS is more sensitive to volume overload due to aortic regurgitation.

A PROSPECTIVE SINGLE-CENTRE STUDY OF FUNGAL INFECTIVE ENDOCARDITIS

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Objectives Fungal infective endocarditis is a rare and poorly understood complication of fungemia. Given the rarity of this infection, few studies are available on Fungal IE. Most epidemiologic data are derived from case reports. This study was conducted to explore the clinical characteristics, treatment patterns, and outcomes of patients with Fungal IE.

Methods We conducted a prospective, observational study in the Fuwai Hospital, National Center for Cardiovascular disease, including all consecutive patients with a definite diagnosis of IE admitted from January 2006 through December 2011. The overall characteristics and risk factors for death from FE were analysed.

Results Between January 2006 and December 2011, a total of 22 patients with fungal infective endocarditis were identified. The mean age at presentation was 52±6 years, with a slight male predominance. There were 16 (78%) patients with involvement of a mechanical prosthesis; the majority (64%) had early prosthetic valve endocarditis (PVE), five cases (23%) of native valve endocarditis (NVE), one case of pacemaker endocarditis. None of them were intravenous drug users. Most patients (82%) had healthcare-associated IE. The aortic valve was most commonly affected, and the most common aetiologic agent was Candida species, followed by Histoplasma capsulatum, filamentous fungi and pharyngeal aspergillus. The most common symptom at presentation was persistent infection (77%), followed by weight loss, major vessel embolism, and Anaemia. Major complications occurring during the acute infective phase were also recorded, including renal infarction (73%), New York Heart Association class III-IV heart failure (45%), and neurological complication (36%). Initial therapy consisted of a combination of antifungals in 12 of 22 patients (55%). Eight patients (36%) underwent valve replacement. Pathological evaluation of valve material was of high yield, with organisms identified in 87% of cases who underwent valve replacement surgery. Prosthetic valve fungal endocarditis was associated with a high morbidity and mortality, with 77% of patients experiencing complications and 45% of patients dying of infection-related disease. The overall hospital mortality rate was 66.7%. A better outcome was observed in patients treated with a combined medical and surgical therapy.

Conclusions Fungal infective endocarditis is an increasingly prevalent and devastating disease in today’s highly advancing medical practice. An aggressive approach should be considered in patients with prosthetic intravascular devices and significant risk factors for nosocomial fungemia. Microorganism should be investigated particularly by molecular methods on surgical specimens.
**ABSTRACTS**

**GW23-e1433**  
**EFFECTS OF BENAZEPRIL ON LEFT VENTRICULAR REMODELLING AND EXERCISE TOLERANCE IN PATIENTS WITH VALVULAR HEART FAILURE**  
doi:10.1136/heartjnl-2012-302920s.6

The First Affiliated Hospital of Gannan Medical College

**Objectives**  
To investigate the effects of Benazepril on left ventricular remodelling and exercise tolerance in patients with valvular heart failure (VHF).

**Methods**  
60 patients with VHF were divided into group A (the control group, n=28) and group B (Benazepril group, n=32) randomly. The general therapy (digitalis, diuretic agent) was given to group A while Benazepril was added to group B besides general therapy. Before and after 12-month period of treatment, the distance of 6 min walk was tested, and changes of left ventricular end diastolic diameter (LVEDD), left ventricular end systolic diameter (LVESD) and left ventricular fraction shortening (LVFS) were measured by UCG.

**Results**  
Compared with which of the control group, LVEDD decreased [(55.2±6.1) mm vs (60.8±3.9) mm, p<0.01], LVESD decreased [(44.5±6.9) mm vs (49.2±7.2) mm, p<0.01], LVFS increased [(24.2±5.4)% vs (20.1±4.9)%, p<0.01] and the distance of 6 min walk increased [(480±88.2) m vs (398±79.9) m, p<0.05] in Benazepril group.

**Conclusions**  
Benazepril could remarkably improve the ventricular remodelling and exercise tolerance of patients with valvular heart failure.

**GW23-e2180**  
**ONE CASE REPORT OF MYOCARDIAL INFARCTION INDUCED BY LEFT ATRIAL MURAL THROMBUS SHEDDING IN RHEUMATIC HEART DISEASE**  
doi:10.1136/heartjnl-2012-302920s.7

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**Objectives**  
I. Clinical data

The patient was a 49-year-old female who presented with complaints of recurrent chest discomfort and serious jaw pain for 7 days. The ECG of the patient made in local hospital showed that the ST-segments were camponotus-like elevation in V2-V6 leads. Then, she was diagnosed as acute anterior wall myocardial infarction and given intravenous thrombolytic therapy with urokinase. The discomfort of chest pain and chest tightness was disappeared 1 h later. The ECG and myocardial enzyme were consistent with the dynamic changes of acute myocardial infarction. The patient had no history of hypertension, coronary heart disease, hyperlipidemia, diabetes and no family history of premature cardiovascular disease. In recent 3 years, the sick often felt dyspnoea when she was doing hard work. Physical examination showed BP was 126/72 mm Hg and the heart rate was 66/ min with a fairly regular rhythm. ECG showed poor R wave progression and abnormal ST-T in lead V3-V6. The echocardiography showed that the sick were rheumatic heart disease with moderate mitral valve stenosis, left atrium thrombus, and weak anterior wall movement. Coronary artery angiography was normal. According to the medical history, we gave the following diagnosis: (1) Acute extensive anterior myocardial infarction (the possible reason was that the falling off of thrombus in left atrium caused anterior descending artery embolism and it became clear after a intravenous thrombolysis); (2) Rheumatic heart disease with moderate mitral valve stenosis and left atrium thrombus. We considered the acute extensive anterior myocardial infarction had nothing to do with coronary atherosclerosis, so we did not use anti-platelet and hypolipidemic drugs, only gave anticoagulant therapy with warfarin when leaving hospital. The echocardiography 3 months later showed that the thrombosis in left atrium was disappeared. The patient was performed replacement of mitral valve successfully in cardiac surgery in December 2011. Now she felt well and keep taking warfarin all the time.

**Methods**  
The most of myocardial infarctions are caused by broken of unstable plaque in coronary artery and some are related with the serious spasm of coronary artery. The rest are caused by some rare reasons such as coronary embolism, injury, deformity or inflammation.

**Results**  
The patient had not yet entered menopause and had on traditional risk factors of coronary heart disease such as high blood-fat, blood-pressure, diabetes, smoking, fatness, hyperhomocysteine and premature cardiovascular disease family history. In the whole process of the disease there were typical ischaemic chest pain and the dynamic evolution of ECG and myocardial enzyme which were in accord with the change of the myocardial infarction.

**Conclusions**  
The patient was diagnosed as acute extensive anterior myocardial infarction finally. Considered the coronary angiography of the patient was normal, we summarised that the myocardial infarction was likely caused by break off of the thrombus which brought embolism of left anterior descending arterial and disappeared after intravenous thrombolysis.

**GW23-e2028**  
**THE COMPARE OF DIAGNOSTIC VALUE BETWEEN DUKE CRITERIA AND TRIAL STANDARD OF CHINA FOR THE CHINESE INFECTIVE ENDOCARDITIS**  
doi:10.1136/heartjnl-2012-302920s.8

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**Objectives**  
To analyse the diagnostic value with Duke criteria and Trial Standard of China for the Chinese infective endocarditis.

**Methods**  
182 Clinical diagnosis IE cases were selected from 2005 to 2011 in our hospital to analyse the diagnostic value with Duke criteria and Trial Standard. Among those, 38 cases of IE confirmed by pathology diagnostic analysis. And compare the two standard sensitivity and specificity of the diagnosis of IE.

**Results**  
11 cases with 2 or more than 2 times consecutive blood culture positive for the same bacteria in the 182 cases of IE patients, echocardiography detected vegetations 164 cases, 3 cases with 2 or more than 2 times consecutive blood culture positive for the same bacteria in 38 patients confirmed by pathologically, and 35 cases detected vegetation by echocardiography. Among 38 patients confirmed by pathologically, 19 cases was diagnosed IE by using the Duke criteria, but 35 cases were diagnosed IE using Trial Standard of china. So 38 patients confirmed with pathologically cases, Diagnostic sensitivity of Duke criteria and Trial Standard of china was 50% and 92.1% respectively, and specificity were 100% and 96.5%.

**Conclusions**  
Trial Standard of china combine echocardiography and two minor criteria was better than the Duke criteria on the diagnostic sensitivity of clinical diagnosis of IE, while no significant difference in specificity.
**GW23-e0887**  
**CLINICAL APPLICATION OF MIN-DIAMETER ATRIA STEEL-WIRE IN MODIFIED PERCUTANEOUS BALLOON MITRAL VALVULOPLASTY**  
Wang Xiaopeng, Deng Wei, Liu Xin-qiang, Wang Xiaoping. Department of Cardiology, First Affiliated Hospital of Gannan Medical University  

**Objectives** To evaluate the efficacy, feasibility and safety of the min-diameter half and two convolutions atria steel-wire used in modified percutaneous balloon mitral valvuloplasty (PBMV).  

**Methods** Totally 63 patients with moderate and severe mitralis stenosis of rheumatic valvular disease of the heart combined with thrombotic left auricle were enrolled from First Affiliated Hospital, Gannan Medical University between August 2003 and October 2005. After all patients received warfarin tabella for more than 3 months, thrombus disappeared in eight patients, while other 55 patients underwent PBMV with the min-diameter (3 cm) half and two convolutions atria steel-wire and single balloon Inoue technique after low dosage urokinase intravenous drip and low molecular heparin injection for 5 days to observe the changes of the modynamics and mitral valve orifice area after PBMV. After follow-up for 6 months, pulmonary arterial pressure, inner diameter of left atrium and complication as systematic thromboembolism were observed.  

**Results** A total of 54 patients were involved in the result analysis. During the trial, 8 without thrombus after warfarin anticoagulant therapy and 1 died of traffic accident were out of the result analysis. (1) After PBMV, mean left atrial pressure (LAPm) and mean mitral valve orifice pressure gradient (MVOPG) were remarkably lower than that before PBMV [(1.67±0.34), (0.86 ±0.26) cm², p<0.01]. (2) Six-months after PBMV left atrial diameter (LAD) was smaller dramatically than that before PBMV [(46.5±4.3),(65.5±5.4) mm, p<0.01]. Pulmonary pressure (FP) was lower markedly than that before PBMV [(51.5±12.7), (63.8 ±12.3) mm Hg, p<0.05]. Steel-wire with heart and human body was in the high consistence of biomec patibility. Its standard was accorded with ISO 10993. No rejection or systemic thromboembolism occurred during the operation and 24 h after operation.  

**Conclusions** PBMV on patients after sufficient anticoagulation and thrombolysis combined the min-diameter half and two convolutions atria steel-wire that is used in improving single balloon Inoue technique is safe, feasible and effective.  

**GW23-e0895**  
**ANALYSIS OF 293 CASES AFTER PERCUTANEOUS BALLOON MITRAL VALVULOPLASTY**  
Xie Dongming, Zhang Yiming, Liao Wei, Wei Xiaojun, Xie Dongming. The Affiliated Hospital, Ganann Medical College  

**Objectives** To observe the short-term results and appropriateness of the use of percutaneous balloon mitral valvuloplasty (PBMV) on the patients with rheumatic mitral stenosis.  

**Methods** 293 patients with rheumatic mitral stenosis underwent percutaneous balloon mitral valvuloplasty (PBMV) with the Inoue balloon catheter. MVA, MPF, PAF LAF, LAD, CO, the cardiac function (NYHA) and value notice variables were assessed at before and after PBMV.  

**Results** The mitral valve areas after PBMV is significantly larger than before PBMV. Blood dynamic factors and cardiac function after PBMV improved significantly than before PBMV (p<0.01).  

**Conclusions** PBMV is a safe and appropriate therapy with good short-term results for selected patients with mitral stenosis.

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**GW23-e0877**  
**CLINICAL STUDY OF OLD AGED PATIENTS WITH AORTIC VALVE CALCIFICATION**  
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**Objectives** To evaluate the incidence of aortic valve calcification, and the correlation with valve function and commonly encountered disease in the aged  

**Methods** 996 patients underwent ultrasonic cardiograph (UCG) in our hospital were included, they were divide into older-age group and non-older-age group, the older-age group was divided into calcification subgroup and non-calcification subgroup. The calcification, stenosis and regurgitation of aortic valve were evaluated by UCG, risk factors of calcification were evaluated by logistic regression analysis.  

**Results** 1. The incidence of calcification in older-age group was significantly higher than that in non-older-age group [71.8% (526/735) vs 14.6% (34/235), p<0.001]. 2. In older-age group, the incidence of aortic valve stenosis was 2.1% (11/526) in calcification subgroup and 1.9% (4/207) in non-calcification subgroup, there was no statistical significance between two subgroups (p>0.05). 3. In older-age group, the incidence of aortic valve regurgitation was 63.3% (333/526) in calcification subgroup and 19.3% (40/207) in non-calcification subgroup, there was significant difference between two subgroups (p<0.001). 4. The HR of aortic valve calcification in different diseases were as follows: Hypertension (HR 2.060, 95% CI 1.400 to 3.061, p<0.001), Coronary heart disease (HR 3.455, 95% CI 2.217 to 5.384, p<0.001), Diabetes mellitus (HR 2.659, 95% CI 1.652 to 4.278, p<0.001), Renal dysfunction (HR 2.339, 95% CI 1.415 to 3.869, p=0.001), Osteoporosis (HR 2.327, 95% CI 1.119 to 4.838, p<0.05).  

**Conclusions** In older-age patients the incidence of calcification was high, and aortic valve regurgitation was seen frequently in these patients. Patients with hypertension, coronary heart disease, diabetes mellitus, renal dysfunction and osteoporosis were prone to the development of aortic valve calcification.

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**GW23-e1208**  
**STUDY ON PREVENTION OF EMBOLISM IN NONVALVULAR ATRIAL FIBRILLATION**  
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**Objectives** To study Warfarin and appropriate INR in order to prevent thromboembolism of non-valves cardiac disease.  

**Methods** Patients of non-values cardiac disease were divided into Warfarin group (treatment group 57) and Aspirin group (control group 85). Patients of treatment group were dispensed by Warfarin, the
dosage was 2.5–3.0 mg/d and the range of dosage was 1.5–4.0 mg/d. Then detect the value of INR every other day; and 1 month later, INR was detected every month after INR was inclined to be stable. According to the value of INR, we adjusted the dosage of Warfarin in order to keep the INR between 1.6 and 2.5. Meanwhile, patients of control group were given Aspirin orally at dining, the dosage was 100 mg/d. Clinical prognosis of the both groups such as thromboembolism and haemorrhage were followed up.

Results 2 cases were found thromboembolism in Warfarin group while 8 cases in Aspirin group, there was significant difference (p<0.05). And 5 cases were found haemorrhage in Warfarin group while 6 in Aspirin group, there was no significant difference (p>0.05).

Conclusions It is safe and effective when using Warfarin to prevent thromboembolism of non-valves cardiac disease, on condition that the value of INR is kept between 1.6 and 2.5.

GW23-e0693 THE RELATIONSHIP BETWEEN CALCIIFICATION OF HEART VALVES AND AGE

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Objectives To investigate the relationship between calcification of heart valves and age.

Methods 966 patients were divided into 6 groups by age: <50 years, 50–60 years, 60–70 years, 70–80 years, 80–90 years and >90 years. All the patients underwent ultrasonic cardiography for assessment of heart valval calcification. The relationship between valcal calcification and age was studied by logistic regression analysis.

Results

1. The incidence of one valve calcification in six groups was 2.6%, 17.0%, 43.4%, 82.3%, 91.7%, 92.2% respectively, the difference between each group had statistical significance (p<0.001);
2. The incidence of two valves calcification in six groups was 0%, 0%, 1.6%, 7.0%, 18.3%, 31.0% respectively, the difference between each group had statistical significance (p<0.001);
3. Aging (for each additional 10 years) predicted valve calcification, HR was 3.663 (95% CI 3.108 to 4.317, p<0.001) by single-factor control and 3.223 (95% CI 2.669 to 3.892, p<0.001) by multiple-factors control.

Conclusions The incidence of heart valve calcification increased by aging, people more than 60 years old were easier to occur heart valve calcification.

GW23-e0421 STUDY ON RELATIONSHIP BETWEEN VENTRICULAR RATE CONTROL AND CARDIOPULMONARY EXERCISE FUNCTION & QUALITY OF LIFE AMONG PERMANENT ATRIAL FIBRILLATION PATIENTS

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Objectives It is controversial regarding the goal for controlling ventricular rate among permanent atrial fibrillation (AF) patients. RACE II tests showed that both the level 1 composite end point and the quality of life for ventricular rate leisent group control is no worse than strict control group among permanent AF patients. However, quality of life evaluated with RACE II was only based on rate of re-hospitalisation. There is no clinical research on association between ventricular rate control and cardiopulmonary exercise function/quality of life among permanent AF patients. This study aimed to explore their relationship.

Methods We included 66 in-and out-patients with permanent AF who visited Peking University Third Hospital from September 2009 to May 2011. The enrolled patients aged from 35 to 80 (Mean: 66.3; SD: 9.3), and 46 were male (69.7%) and 20 female (30.3%). Data on their AF duration, complications, clinical drug usage, main biochemical indicators and Holter examinations were collected. All patients took a cardiopulmonary exercise testing (CFET) and their heart rate at rest and during moderate exercise, VO2 peak/kg, MET speak and VO2AT/kg were recorded. SF-36 quality of life evaluation forms were filled out.

Results

1. Stratified by different ventricular rate control (resting HR, HR during moderate exercise, the both above, and average heart

Non-invasive cardiac electrical inspection

GW23-e0085 AMBULATORY ECG-BASED T-WAVE ALTERNANS AND HEART RATE TURBULENCE IN PATIENTS WITH MYOCARDIAL INFARCTION WITH OR WITHOUT DIABETES MELLITUS

doi:10.1136/heartjnl-2012-302920t.1

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Objectives Many patients who survive a myocardial infarction (MI) remain at risk of sudden cardiac death despite revascularisation and optimal medical treatment. We used the modified moving average (MMA) method to assess the utility of T-wave alternans (TWA) and heart rate turbulence (HRT) as risk markers in MI patients with or without diabetes mellitus (DM).

Methods The study population included 248 patients: 96 with MI (group post-MI); 77 MI with DM (group post-MI+DM); 75 controls (group control). Both TWA and HRT were measured on ambulatory ECG (AECGs). TWA (>47 μV) was considered abnormal. HRT was assessed by two parameters—turbulence onset (TO) and turbulence slope (TS), and HRT values were classified into three categories. HRT was considered positive when both TO ≥0% and TS ≤2.5 ms/R–R interval were met. The endpoint was cardiac mortality.

Results T-wave alternans differed significantly between controls and post-MI groups with (37±13 μV VS 55±21 μV, p<0.05) or without DM (37±13 μV VS 52±18 μV, p<0.05), and compared to post-MI group, group post-MI+DM had a higher TWA values (p=0.029). Average values for TO and TS differed significantly between controls and the two post-MI groups (p<0.05). Groups post-MI with or without DM had a higher association of positive results for both TWA (>47 μV) and HRT (TO ≥0% and TS ≤2.5 ms/R, p<0.017) and the combination of abnormal TWA and positive HRT had significant association with the endpoint (HR (95% CI) 9.08, 2.21 to 37.2; p=0.002).

Conclusions TWA values in post MI with DM was higher than post MI. Impaired HRT, increased TO and decreased TS were observed in MI patients with or without DM. TWA and HRT may be useful predictors of cardiac and arrhythmic death in MI patients.
rate), there was no significant differences of VO₂ peak/kg, MET speak and VO₂AT/kg between ventricular rate lenient control group and strict control group.

2. Stratified by resting heart rate, PCS and MCS for ventricular rate lenient control group were significantly higher than strict control group. Multivariate linear regression results indicated that resting heart rate was not correlated with PCS or MCS, with p values close to 0.05.

3. Stratified by HR during moderate exercise, MCS for ventricular rate lenient control group was significantly higher than strict control group, but difference of PCS was of no statistical significance. Multivariate linear regression results suggested that HR during moderate exercise was correlated with MCS.

4. Stratified by average heart rate, there was no significant difference of PCS and MCS between ventricular rate lenient control group and strict control group.

Conclusions

1. For permanent AF patients, ventricular rate lenient control and strict control did not make a significant difference in cardiopulmonary exercise function.

2. Compared with ventricular rate lenient control, strict control could significantly raise the quality of life among permanent AF patients.

GW23-e1013 RELATIONSHIP BETWEEN ATRIAL FIBRILLATION CARDIOVERSION AND F

doi:10.1136/heartjnl-2012-302920t.3

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Objectives To investigate the relationship between atrial fibrillation cardioversion and f wave in electrocardiogram, providing an ordinary and noninvasive method for the clinical prediction and treatment.

Methods We selected 50 cases of patients with atrial fibrillation living in our hospital and divided into two groups according to the size of each indicators, such as f wave discrepancy, f wave amplitude, f wave duration, diameter of the left atrial, left ventricular ejection fraction and plasma BNP level. (f wave duration ≥110 ms vs f wave duration <110 ms; f wave discrepancy ≥50 ms vs f wave discrepancy <50 ms; f wave amplitude ≥0.1 mv vs f wave amplitude <0.1 mv; diameter of the left atrial ≥40 mm vs diameter of the left atrial <40 mm; left ventricular ejection fraction ≥50% vs left ventricular ejection fraction <50%; plasma BNP level ≥200 mmol/l vs plasma BNP level <200 mmol/l). We observed the rate of atrial fibrillation within 72 h and calculated the predictive value of indicators for atrial fibrillation cardioversion.

Results

1. The diversion rate from atrial fibrillation was 69% in group of f wave duration ≥110 ms vs <110 ms (p<0.05), 55% in group of f wave discrepancy ≥50 ms vs <50 ms in group of f wave discrepancy ≤50 ms (p<0.05), 60% in group of f wave amplitude ≥0.1 mv vs f wave amplitude <0.1 mv (p<0.05). 70% in group of the left atrial diameter ≥40 mm vs <40 mm (p<0.05), 54% in group of left ventricular ejection fraction ≥50% vs 15% in group of left ventricular ejection fraction ≥50%. 62% in group of plasma BNP level <200 mmol/l vs 25% in group of plasma BNP level ≥200 mmol/l (p<0.05).

2. Receiver operating characteristic curve show that: area under the curve of f wave duration ≥110 ms was 0.71, of f wave discrepancy ≥50 ms was 0.70, of f wave amplitude ≥0.1 mv was 0.70, of the left atrial diameter <40 cm was 0.76, of left ventricular ejection fraction ≥50% was 0.70, of plasma BNP level <200 mmol/l was 0.73, all larger than 0.7, with p value all less than 0.05. So all of them had diagnostic value to some extent. When the Youden’s index reached maxism, their cut point were 78 ms, 42 ms, 1.0 mv, 39.5 mm, 60%, 207 mmol/l.

3. Among single risk factor, the specificity, sensitivity, positive predictive value and negative predictive value of f wave duration ≥110 ms were 41%, 86%, 69%, 65%; the specificity, sensitivity, positive predictive value and negative predictive value of f wave amplitude <0.1 mv were 82%, 46%, 55%, 76%; the specificity, sensitivity, positive predictive value and negative predictive value of f wave amplitude ≥0.1 mv were 68%, 64%, 60%, 72%; the specificity, sensitivity, positive predictive value and negative predictive value of left atrial diameter ≥40 mm were 75%, 75%, 70%, 78%; the specificity, sensitivity, positive predictive value and negative predictive value of left ventricular ejection fraction ≥50% were 91%, 39%, 54%, 85%; the specificity, sensitivity, positive predictive value and negative predictive value of plasma BNP level <200 mmol/l were 73%, 75%, 64%, 62%, 75%, the sensitivity and negative predictive value of left ventricular ejection fraction ≥50% to predict cardioversion of atrial fibrillation was highest, and the specificity and positive value of f wave duration ≥110 ms to predict cardioversion of atrial fibrillation was highest. Along with more than two risk factors, the specificity and negative predictive value were much higher, but the sensitivity and positive predictive value were much lower. Multiple logistic regression analysis revealed that the f wave amplitude was an independent predictor of cardioversion of atrial fibrillation.

Conclusions F wave characteristics are electrocardiographic markers that can be used for the prediction of cardioversion of atrial fibrillation.

Cardiovascular surgery

GW23-e1573 SERUM LEVELS OF VON WILLEBRAND FACTOR ARE ASSOCIATED WITH ANGIOGRAPHIC ANGIOGRAPHIC NO-REFLOW AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION FOR ST SEGMENT ELEVATION MYOCARDIAL INFARCTION

doi:10.1136/heartjnl-2012-302920u.1

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Objectives Primary percutaneous coronary intervention (PPCI) is an important therapy for patients with acute ST-segment elevation myocardial infarction (STEMI). However, the restoration of epicardial coronary patency after coronary occlusion does not always guarantee adequate perfusion of myocardium at risk of ischaemia. This phenomenon was called no-reflow. It may inhibit the expected benefit from revascularisation of infarction related artery (IRA) and lead to poor functional and prognostic outcomes. The pathogenesis of no-reflow after PPCI is multifactorial, including distal embolisation from ruptured plaque or thrombus fragmentation, microvascular vasoconstriction, and, more importantly, platelet aggregation seems play a key role in the pathogenetic procedure. Therefore, mediators affecting platelet activation, such as von willebrand factor (vWF), might be involved in mechanism of no-reflow. The aim of this study was to investigate whether serum level of vWF is associated with angiographic no-reflow and whether it could be one of the markers to predict angiographic no-reflow after PPCI in patient with STEMI.

Methods 111 consecutive STEMI patients undergoing successful PPCI were studied. On the basis of post-stent TIMI flow and
corrected TIMI frame count (CTFC) of target vessels, the patients were divided into two groups, namely no-reflow group (n=25) and reflow group (n=86). The patients’ venous blood sample was taken before and after PPCI (within 24 h), and the serum levels of vWF, Tnl, CK-MB, and hs-CRP were measured by enzyme linked immunosorbent assay (ELISA) and other methods. The differences between two groups were compared in basic clinical data, coronary angiography data, serum levels of vWF and other biomarkers. The association of vWF and other biomarkers with CTFC of target arteries were analysed. Multivariable logistic regression analysis was applied to identify independent clinical predictors for no-reflow among the variables showing a significant association with no-reflow at univariate analysis.

Results In the comparison of basic clinical data, the two groups were similar with respect to sex, current smoking, hypertension, hyperlipidemia, time from onset to taking blood, time of taking blood after PCI. The serum levels of vWF, both pre-PPCI and post-PPCI, were significantly higher in no-reflow group (236.5±52.2 mU/ml vs 151.9±44.3 mU/ml, p<0.01) or in no-reflow group vs 17.7±4.3 mm in reflow group (31.7% vs 72.5%, p<0.01) when compared with reflow patients. No-reflow group was higher (p<0.05), LVEF on admission was similar with respect to sex, current smoking, hypertension, hyperlipidemia, and the increasing percentage between post-and pre-PPCI was larger (7.7%) in our country. Compared to the patients with normal ABI, low ABI patients were older and had significant association with conventional risk factors.

Conclusions The prevalence of peripheral arterial disease as judged by ankle brachial index in known patients of CAD is much lower (7.7%) in our country. Compared to the patients with normal ABI, low ABI patients were older and had significant association with conventional risk factors.

GW23-e1416 THE CLINICAL EFFICACY AND SAFETY OF TREATMENT FOR DEBEKEY TYPE III AORTIC DISSECTION BY DOMESTIC COVERED INTRAVASCULAR STENT doi:10.1136/heartjnl-2012-302920u.3

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Objectives To explore the clinical efficacy and safety of treatment for Debekey type III aortic dissection by domestic covered intravascular stent.

Methods From June 2006 to December 2011, 75 patients with Debekey type III aortic dissection underwent contrast-enhanced CT scan or MRI diagnosis, concurrent aortic angiography, the application of QCA vascular quantitative analysis software for measurement, select the appropriate type stent vascular inner wall of aortic dissection primary crevasse, repeat angiography observation bracket position check for leakage. The observation of internal leakage, stent migration and false cavity changes on CT 3 months after operation.

Results All these 75 patients with stent placement were treated successfully, the successful rate was 100%. Four cases involved the ostium of the left subclavian artery have also successfully completed the operation by domestic covered stent vascular branches, five patients with distal crevase simultaneously were sealed through operation, one patients died of intestinal bleeding 4 weeks after operation, one patients has the left femoral nerve skin support injury, but a mild walking limitation. Immediate
postoperative angiography: 72 patients with the proximal crevasse were sealed through operation, and restore true cavity flow, and the endoleak has disappeared by implanting the second stent in the proximal crevasse. All patients were followed up by CT: 65 cases of aortic dissection disappeared, the false cavity thrombosis, 10 cases of distal false cavity in existence, but artery no expansion.

**Conclusions** Domestic covered stent placement in the treatment of DeBakey type III aortic dissection is feasible and safe, and with less trauma, fewer complications, and treatment of lower cost, the results of short-term were satisfactory.

**GW23-e1481** **PAINLESS AORTIC DISSECTION WITH INITIAL SYMPTOMS OF PARAPLEGIA AND ACUTE RENAL FAILURE: A CASE REPORT**

Zheng Ziyu, Ye Z., Ye Jialin, Wang Weiping, Zhan Hong. Department of Emergency; The First Affiliated Hospital of Sun Yat-sen University

**Objectives** A 67-year-old man was transferred to the Emergency Department of our hospital for emergent evaluation of paraplegia and oliguria, from the local hospital of the nearby town, where he was admitted complaining from sudden, painless, progressive bilateral leg weakness and oliguria 4 days earlier. He gave no history of hypertension, diabetes mellitus or hyperlipidaemia, and had a negative family history of aortic diseases. On initial evaluation, the patient had a blood pressure of 131/71 mm Hg. His oral temperature was 36.4°C, pulse rate was 82 beats/min and respiratory rate was 20/min. He presented complete flaccid paraplegia with oliguria (urinary output <400 ml/d) and urinary retention, loss of pain and temperature sensation, vibration and position sense below the TH7 level bilaterally. Other general physical examinations were unremarkable. Laboratory tests showed a white blood cell count of 19.80×10⁹/l, haemoglobin concentration of 109 g/l, blood urea nitrogen concentration of 50 mmol/l, blood creatinine concentration of 820 μmol/l, sodium concentration of 114 mmol/l, and potassium concentration of 4.6 mmol/l. The liver function tests were normal and other observations were unremarkable. Later thoracic and lumbar MRI revealed swelling of thoracolumbar spinal cord, with no enhancement on T1-weighted images (wi) and increased signal on T2-wi at the TH9-TH12 levels, suggesting cord ischaemia. At the same MR sequences, the double lumen of the descending aorta involving bilateral renal arteries indicated dissection in both sagittal and axial images. The diagnosis of Stanford type B acute aortic dissection was confirmed. When patients present with or develop signs and symptoms of paraplegia without obvious cause, aortic dissection should be considered, even without the presence of characteristic thoracic pain.

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GW23-e2641  THE SAFETY OF CAROTID ARTERY STENTING BEFORE OPEN HEART SURGERY

Jiang Xiongjing, Fuwai Hospital

Objectives To evaluate the safety of carotid artery stenting (CAS) before open heart surgery (OHS) and to explore the effect of risk factors on the incidence of the main cardiovascular events.

Methods In a prospective cohort study, clinical data of all patients underwent CAS before OHS in Fuwai Hospital from January 2005 to December 2009 were collected. The end points (stroke, myocardial infarction and death) from time of CAS to 30 days after OHS were assessed and the effect of risk factors on the main cardiovascular events was analysed.

Results A total of 120 consecutive patients scheduled for CAS and OHS, mean age 65.6±10.9 years, male 81.7%, were recruited. The procedural success rate of CAS was 99.2%. Cerebral protection devices were used in 134 lesions (99.3%). In them, 12 patients were treated with simultaneous bilateral carotid stenting. The rate of major stroke, myocardial infarction and death from time of CAS to 30 days after OHS was 3.4%, 2.5% and 3.4% respectively. Multivariable logistic regression revealed that the severity of coronary heart disease and interval time of CAS and OHS were independent predictors of the main cardiovascular events. Furthermore, the incidence of the main cardiovascular events was lowest while OHS was performed in 6–30 days after CAS.

Conclusions This study indicated that CAS before OHS was safe and effective. The severity of coronary heart disease and interval time of CAS and OHS were independent predictors of the main cardiovascular events.

GW23-e1714  VALUE OF D-DIMER FOR DETECTION OF ACUTE AORTIC DISSECTION

Zheng Ziyu, Ye Zì, Ye Jialin, Wang Weiping, Zhan Hong, Department of Emergency, The First Affiliated Hospital of Sun Yat-sen University

Objectives The purpose of this research was to assess the value of several plasma biomarkers in the detection of acute aortic dissection (AAD).

Methods From 2006 to 2011, 118 consecutive patients with established AAD, 94 consecutive patients with chronic aortic aneurysms scheduled for elective surgery in our hospital and 98 normal subjects were evaluated for plasma D-dimer, C-reactive protein (CRP) and N-terminal pro-B-type natriuretic peptide (BNP).

Results All AAD patients showed significantly higher elevated D-dimer values compared to both the chronic aneurysm patients as well as the normal subjects (p<0.0001). A cut-off value of 850 ng/ml was effective in distinguishing AAD from the other two groups, with a sensitivity of 90% and a specificity of 62%. Plasma CRP and BNP values in AAD or chronic aortic aneurysms were much higher than in the normal controls (p<0.0001 and p=0.0016, respectively), but these parameters did not show significant differences between AAD and chronic aortic aneurysms (p=0.32).

Conclusions D-dimer can be used as a ‘rule-out’ test in patients with suspected AAD and, unlike CRP and BNP, it seemed could help making a differential diagnosis between AAD and chronic aortic aneurysms.

GW23-e1615  FROM MURAL THROMBUS TO SUPERIOR VENA CAVA SYNDROME: IS SEEING BELIEVING?

Kong Lingxiao, Tan Hong, Westchina Hospital

Objectives A 28-year-old woman presenting with a 3-month history of dyspnoea after the parturition was referred to our department for the diagnosis of mural thrombus in the left atrium. In the past, she was never found to have heart diseases, lung disease, relevant history of familial heart disorders and she had never been exposure to the poison or radiation during pregnancy. A physical examination revealed a distinct oedema on the face. Routine echocardiography in our centre revealed a huge ‘mural thrombus’ like immobile mass (Figure ABC, asterisks) in the left and right atrium. Subsequent transesophageal echocardiography showed the sessile mass in the atrium, suggestive of malignant tumour, had caused superior vena cava (SVC) and left inferior pulmonary vein obstruction (Figure C, arrows; Online Video 1–2). Multidetector CT angiography demonstrated a huge mediastinal
neoplasm surrounding the great vessels. The SVC was compressed and invaded and it was so narrow (4 mm) that almost no blood could get through (figure E,F). The most common malignancy associated with superior vena cava syndrome is lung cancer, followed by lymphomas and metastatic tumours to the mediastinum. Unfortunately this patient refused to get the surgery for the high medical costs, so the properties of the tumour is unknown, while the case has told us that multimodality imaging is recommended in such a patient in order to distinguish the mural thrombus from the extracardic malignant disorders.

Methods

Conclusions

Related pharmaceutical clinical research

GW23-e2656

EFFECTS OF STATIN LOADING BEFORE PRIMARY PCI ON CORONARY ENDOTHELIAL FUNCTION AND INFLAMMATION

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Objectives

The Novel approaches for preventing or limiting events (NAPLIES) and The Atorvastatin for Reduction of Myocardial Damage during Angioplasty (ARMYDA) studies demonstrated a beneficial effect of statin loading in preventing major adverse cardiac events (MACE) after elective percutaneous coronary intervention (PCI) for stable angina, unstable angina, non-ST-segment-elevation myocardial infarction (NSTEMI). The so called ‘pleiotropic effects’ of statins include modulation of endothelial function, inhibition of inflammation, and attenuation of thrombosis, all of which could provide clinical benefits in the setting of elective PCI by reducing postprocedural incidence of myocardial and MACE. So far, the efficacy of atorvastatin loading in patients with acute ST-segment-elevation myocardial infarction (STEMI) undergoing primary PCI has not been confirmed. Also, whether the ‘pleiotropic effects’ of statins could explain the possible mechanism(s) needs to be discussed. This study sought to explore potential protective effects of statin loading before primary PCI on coronary endothelial function, inflammation, and MACE.

Methods

A total 60 patients with STEMI were randomised into loading dose group (80 mg atorvastatin before PCI, n=20), regular dose group (20 mg atorvastatin before PCI, n=20), and control group (without atorvastatin before PCI, n=20). All patients received primary PCI and routine treatment. The plasma samples were collected before, immediately after, 6 h after and 24 h after PCI in all the patients. Plasma concentrations of endothelial nitric oxide synthase (eNOS), Nitric Oxide (NO), interleukin-6 (IL-6), tumour necrosis factor (TNF-a), intercellular adhesion molecule-1 (ICAM-1) were tested by ELISA. The results of coronarography, electrocardiogram, myocardial enzyme, high-sensitivity C-reactive protein (hs-CRP), amino terminal-pro brain natriuretic peptide (NT-proBNP), echocardiography, MACE, and the safety of statin loading were also collected.

Results

Plasma eNOS immediately and 24 h after PCI were higher in the loading dose group (p<0.05). Plasma eNOS before and 24 h after PCI, along with plasma NO at any time point did not show significant differences among the 3 groups. Plasma IL-6 before PCI were lower in the loading dose group (90.773±7.646 pg/ml vs 95.992±4.269 pg/ml vs 94.324±3.692 pg/ml, p=0.023). Plasma IL-6 after PCI, plasma TNF-a and ICAM-1 at any time point did not show significant differences among the 3 groups. MACE occurred in 2 (10.0%) patients in the loading dose group, 2 (10.0%) patients in the regular dose group, 3 (15.0%) patients in the control group, respectively (p=0.855).

Conclusions

Atorvastatin loading in patients with STEMI undergoing primary PCI may not have protective effects on coronary endothelial function, inflammation, and MACE.

GW23-e1576

ASSOCIATION TISSUE KALLIKREIN WITH THE SEVERITY OF CORONARY ARTERY DISEASE

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Objectives

The objective of this study was to examine the presence of tissue kallikrein (TK) in coronary artery disease (CAD) and its association with inflammation, intraplaque angiogenesis and plaque stability.

Methods

Plasma TK concentrations were measured in 104 consecutive inpatients with newly diagnosed CAD and 53 in patients with normal coronary arteries who underwent first-time angiography for suspected CAD, and their associations with angiographic indexes of the severity of CAD (number of diseased vessels and Gensini score) were estimated. Patients were divided into 5 groups according to the number of vessels affected. Vascular endothelial growth factor (VEGF), hs-CRP were measured in all subjects. Plaques were obtained from patients undergoing coronary endarterectomy, cross-sections underwent Movat’s and Masson’s trichrome staining, divided into stable and unstable plaque. TK, CD105, CD68 expression were assessed by immunohistochemistry.

Results

Plasma TK was elevated in CAD. TK levels were significantly higher in patients with multi-vessel disease and acute obstruction of one major coronary artery (acute coronary syndrome, ACS) group than those single-vessel CAD, multivessel CAD and control (p<0.01), but the concentration of hs-CRP was justly increased in ACS group, and there were no difference in VEGF among 4 groups. At third day after revascularisation, TK decreased from 3056±1246 to 407±550 pg/ml (p<0.001). After adjustment for background risk factors, TK levels were an independent predictor of the severity of CAD. ROC curve analysis indicates that TK is the best indicator of ACS. Unstable plaque had more TK, macrophages and microvessel density compared with stable (p<0.01). TK expression was mainly observed co-localisation in macrophages.

Conclusions

Plasma TK levels are significantly higher in CAD and are correlated with the severity of the disease. Further clinical studies are needed to confirm the use of TK as a biomarker for the detection and extent of CAD.

GW23-e2710

EFFICACY OF DUAL STRATEGY OF SOTALOL AND ELECTRICAL CARDIOVERSION WITH BALLOON MITRAL VALVOTOMY IN PERSISTENT RHEUMATIC ATRIAL FIBRILLATION WITH MITRAL STENOSIS

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Objectives

A few studies has shown that achievement of normal sinus rhythm (NSR) with amiodarone alone or in combination with direct current (DC) cardioversion is effective and superior to ventricular rate control in rheumatic atrial fibrillation (AF) with...
mitral stenosis (MS), albeit at the cost of amiodarone related adverse effects. We aim to study the efficacy of a less toxic drug sotalol in this patient population.

**Methods** Patients of severe MS with persistent AF who were planned for balloon mitral valvotomy (BMV), received oral sotalol therapy 80 mg twice a day for 1 month. Patients who continued to have AF after sotalol therapy and BMV were DC cardioverted. All Patients who achieved NSR with sotalol alone or with DC cardioversion were given sotalol for 6 months. Primary end points of the study were (1) Rate of conversion to NSR with sotalol alone or sotalol with DC shock and (2) Proportion of patients maintaining NSR at 6 months. Secondary end points were improvement in NYHA class and exercise capacity (on Bruce treadmill protocol).

**Results** A total of 37 patients with mean age of 56.9±7.3 (22 female and 15 male) were included in the study. Thirty-six patients were included in the final analysis. 14 (38.8%) patients spontaneously converted to NSR with sotalol alone and 23 (60%) patients achieved NSR with DC shock and sotalol therapy. Four patients failed to convert after DC shock. A total of 32 patients were evaluated after a follow up of 6 months. 27 (75%) patients maintained NSR with sotalol therapy at 6 months. Mean improvement in NYHA class and exercise capacity were 1.5 (p=0.001) and 4.3 ±1.0 min (p=0.007), respectively. On univariate analysis, Left atrial size<6 cm, duration of AF<17 months and age <45 years were the only predictors of successful conversion to sinus rhythm. On multivariate analysis none of the variables were found to be significantly associated with outcome. None of the patients experienced sotalol related significant adverse effects. These results show equal efficacy of sotalol, when compared to results shown in previous studies with amiodarone, with no significant side effects.

**Conclusions** Sotalol therapy alone or in combination with DC cardioversion is effective in conversion and maintenance of sinus rhythm in rheumatic AF with mitral stenosis. This strategy significantly improves the cardiovascular morbidity in combination with BMV.

**GW23-e2704 CYTOCHROME P450 2C19 POLYMORPHISM AND PLATELET AGGREGATION IN CLOPIDOGREL-TREATED PATIENTS AMONG MALAYSIAN MULTIETHNIC POPULATION**

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**Objectives** Cytochrome P450 2C19 (CYP2C19) *2 (681G>A; rs4244285) and CYP2C19*3 (656G>A; rs4986893) null alleles are responsible for the phenotypes of poor CYP2C19 enzyme function, hence adversely affecting the ability of clopidogrel to inhibit platelet aggregation. In recent years, a novel CYP2C19 gene variant, CYP2C19*17 (−5402C>T; rs1183072), has been identified and is associated with ultrarapid metabolism of CYP2C19 substrate. To date, there is limited data on CYP2C19 prevalence rates in a multi-racial Malaysian population with coronary artery disease planned for percutaneous coronary intervention (PCI), and their impact on clopidogrel-mediated platelet aggregation (CPA). Therefore, the primary objective of this study was to assess the impact of CYP2C19 *2, *3 and *17 on CPA in patients planned for PCI.

**Methods** From the 323 consecutive patients planned for PCI, 237 patients≥18 years of age, underwent either aspirin alone or both aspirin and clopidogrel therapy, were recruited from Sarawak General Hospital Heart Centre (Kota Samarahan, Malaysia). Venous blood samples were collected from each participant before their scheduled appointment for PCI. The CYP2C19*2, *3 and *17 were genotyped by PCR—restriction fragment linked polymorphism (PCR-RFLP) method. The antiplatelet effect of clopidogrel, as assessed by ADP-induced platelet aggregation, was measured by Multiplete impedance aggregometry.

**Results** Of the 237 subjects (mean age 57.6±11.1), 77.6% were male and 22.4% were female. Ethnic group distribution was: Chinese 50.6% (n=120), Malay 21.1% (n=50), Iban 19.0% (n=45) and other races 9.3% (n=22). The allelic frequency of the CYP2C19 *1, *2, *3 and *17 were 65.0% (95% CI 62.1% to 59.0%), 29.0% (95% CI 28.7% to 29.8%), 6.0% (95% CI 5.9% to 6.1%) and 2% (95% CI 1.6% to 2.4%), respectively. Genotype determination revealed that 38.8% were extensive metabolisers (Em: *1/*1, *2/*17), 45.1% intermediate metabolisers (Im: *1/*2, *1/*3), 12.7% poor metabolisers (Pm: *2/*2, *2/*3, *3/*3), 3.0% intermediate ultrarapid metaboliser (Ium: *1/*17) and 0.4% ultrarapid metaboliser (Uum: *17/*17). The frequencies of the CYP2C19*2 variant allele and of the homozygous genotype were higher in Chinese descent individuals (55.8%, 12.5%) compared with other ethnic groups (p=0.010; p=0.022, respectively). Meanwhile, a similar proportion of CYP2C19*3 allele was observed in all ethnic groups (p=0.071). Overall, the PM genotypic prevalence rate was 15.0% in Chinese, 10.0% in Malays, 8.9% in Iban and 18.2% in other subjects (p=0.042). One Chinese subject shown to be homozygous *2 and heterozygous *17, hence resulting in a new combination of *2/*17. The predicted metabolic phenotype for this combination is unknown and we assume that the ultrarapid clopidogrel metabolism by *17 allele may be suppressed by loss-of-function *2 alleles, thus resulting in a functional metabolising enzyme phenotype. Hence, we grouped this individual as EM. Linkage disequilibrium analysis showed that the *17 were in different linkage disequilibrium with *2 and *3. Among the 118 subjects who underwent a similar double antiplatelet loading strategy (75 mg loading doses of aspirin for at least 2 days +75 mg loading doses of clopidogrel for at least 4 days), the prevalence rate of PM remains high within Chinese group (17.5%) compared to other ethnic groups (p=0.036). The CPA was observed to be higher in PM (333.6 aggregation unit×min (AU*min)), followed by IM (319.7 AU*min) and EM (310.6 AU*min) compared to *2/*3 carriers also demonstrated higher platelet aggregation (310.6 AU*min) compared to *17 carriers (264.1 AU*min) (p=0.041). The presence of statistically significant differences between the different phenotypic groups could be attributed to the relatively small sample size. Nevertheless, there was a significant influence of CYP2C19 polymorphism on CPA in Chinese subjects only (p=0.032) even after adjustment for various cardiovascular risk factors.

**Conclusions** The CYP2C19*2 is found at high frequency in Malaysians, especially in Chinese subjects, consistent to that found in other Asian populations of Chinese ethnic origin. Other CYP2C19 polymorphisms, particularly *17 were rare in the Malaysian population. However, carriers of *17 demonstrated better CPA compared to *2 and *3 carriers. Our findings indicate a broad inter-ethnic difference in CYP2C19 allelic frequencies. As both the presence of certain genotypes especially *2, and a lower CPA, have been shown to be associated with higher adverse cardiovascular event rates in patients prescribed clopidogrel, subsequent outcome studies in our multi-ethnic population are warranted.
THE INFLUENCE OF ADMISSION HEART RATE ON THE CLINICAL COURSE AND SHORT-TERM OUTCOME OF THE DISEASE IN PATIENTS WITH Q-MYOCARDIAL INFARCTION LEFT VENTRICULAR AND EARLY SYSTOLIC DYSFUNCTION

Xu Yao, Xu Yao. The Bogomolets National Medical University

**Objectives** The purpose of the study was to assess the influence of admission heart rate (HR) on the clinical course and immediate outcomes in patients with Q-myocardial infarction (MI) with left ventricular (LV) ejection fraction (EF) <45%.

**Methods** Retrospective analysis was conducted of 680 patients with Q-wave MI, LV EF <45% and Killip class I-III at admission. According to the admission HR the patients were divided into two groups: 1st (n=154), ≤70 bpm, and 2nd (n=526), >70 bpm. End-diastolic (ED) and end-systolic (ES) anterior-posterior diameter of left atrial (LA) and anteroposterior diameter of right ventricle (RV), end-diastolic posterior wall (PW), interventricular septum (IVS) thicknesses and independent predictors of in-hospital mortality were analysed.

**Results** Patients of both groups did not differ by age, sex, incidence of such diseases in anamnesis as hypertension, MI, unstable angina and stable angina, as well as the frequency of smoking and the localisation of MI (all p>0.05). In the absence of significant differences in average values of systolic and diastolic blood pressure in patients of 1st and 2nd groups, the occurrences of admission Killip class II-III were respectively 19.5 and 36.9% (p <0.001), frequency of increase of Killip class by one class in hospital—respectively 15.6 and 26.6% (p=0.01), in-hospital mortality—respectively 18.8 and 30.8% (p<0.01). The study of LV systolic function parameters in patients of 1st and 2nd groups in the first 3 days registered such results: ESI—respectively (45.8±1.3) and (50.7±0.7) ml/m² (p<0.001), EDI—respectively (75.3±1.9) and (81.9±0.9) ml/m² (p<0.01), IVF EF—respectively (59.8±0.4) and (35.7±0.3) % (p<0.01), LA size—respectively (3.71±0.05) and (3.85±0.03) cm (p<0.01), IVF thickness—respectively (1.02±0.01) and (1.02±0.01) cm (p<0.05), and IVF thickness—respectively (1.02±0.01) and (1.02±0.01) cm (p<0.05). In multivariate analysis, admission HR >70 bpm was an independent from Killip class II-III predictor of unfavourable outcome and was associated with 2.16-fold increase of in-hospital mortality (OR=2.158, 95% CI 1.313 to 3.548, p=0.002).

**Conclusions** In patients with Q-MI and early LV systolic dysfunction, admission heart rate >70 bpm is a significant independent predictor of in-hospital mortality and early LV remodelling. Admission HR >70 bpm in patients with Q-wave MI and LV EF <45% contributes to significantly more frequent in comparison with HR ≤70 bpm increase of Killip class by one class or more, but has no effect on the incidence of potentially fatal ventricular arrhythmias and recurrent MI.

**Objectives** Although the relationship between cigarette smoking and cardiovascular diseases is well established, the interactions of some single nucleotide polymorphisms (SNPs) and cigarette smoking on blood pressure levels are still limited. The present study was undertaken to detect nine SNPs in different lipid-related genes and their interactions with cigarette smoking on blood pressure levels in the Bai Ku Yao, an isolated subgroup of the Yao minority in China.

**Methods** Genotyping of ATP-binding cassette transporter A1 (ABCA-1) rs2066715, acyl-CoA:cholesterol acyltransferase-1 (ACAT-1) rs1044925, low density lipoprotein receptor (LDL-R) Ava II, hepatic lipase gene (LIPC) −250G>A (rs2070895), endothelial lipase gene (LIPC) 584C>T (rs2000815), methylenetetrahydrofolate reductase (MTHFR) 677C>T (rs1801133), prion protein convertase subtilisin-like kexin type 9 (PCSK9) E670G (rs505151), peroxisome proliferator-activated receptor delta (PPARD) +294T>C (rs4725090) and Scavenger receptor class B type 1 (SCARB1) rs5882 was performed using PCR and restriction fragment length polymorphism in 935 non-smokers and 545 smokers. The interactions of nine SNPs and cigarette smoking on blood pressure levels were detected by factorial regression analysis after controlling for potential confounders.

**Results** The genotypic frequencies of ACAT-1 and LIPC, the allelic frequencies of ABCA-1, and the genotypic and allelic frequencies of LDL-R, LIPC, PPARD and SCARB1 were different between non-smokers and smokers (p<0.05–0.001). The levels of pulse pressure (PP) among the genotypes of ABCA-1, and the levels of systolic blood pressure (SBP), diastolic blood pressure (DBP) and PP among the genotypes of LIPC were different in non-smokers (p<0.05–0.001). The levels of SBP among the genotypes of ABCA-1, ACAT-1, LIPC and PCSK9, the levels of DBP among the genotypes of ACAT-1, LDL-R, LIPC, PCSK9 and PPARD, and the levels of PP among the genotypes of LIPC, LIPC, MTHFR and PCSK9 were different in smokers (p<0.05–0.001). The SNPs of ABCA-1, ACAT-1 and PCSK9 were shown interactions with cigarette smoking on SBP levels (p<0.05–0.001), the SNPs of ABCA-1, LDL-R, MTHFR and PCSK9 were shown interactions with cigarette smoking on DBP levels (p<0.05–0.01), and the SNPs of ABCA-1, LIPC, PCSK9 and PPARD were shown interactions with cigarette smoking on PP levels (p<0.05–0.01). Multiple linear regression analysis was also shown that blood pressure levels were associated with the genotypes and/or alleles of several SNPs in the non-smokers and smokers (p<0.05–0.001).

**Conclusions** The differences in blood pressure levels between the non-smokers and smokers might partly result from different interactions of several SNPs and cigarette smoking.

**Objectives** To evaluate the expression of the proteasome each subunit in human atherosclerotic plaque.

**Methods** In carotid endarterectomy specimens from 16 carotid stenosis patients as the case group, that divided into the plaque and the areas adjacent to the plaque. And carotid endarteriums were obtained from four patients undergoing Aortic replacement surgery, selected relatively normal arterial intima (Subclavian artery and Innominate artery) as the control group. Content of...
Conclusions

donor platelets.

1. In case group patients have higher incidence in diabetes, Hyperlipidaemia and possibility of smoking;

2. \( \alpha_1 \), \( \beta_1 \), \( \gamma \) Subunits in the normal arterial endarteriums group, the edge portion of the atherosclerotic plaque, the core part of the atherosclerotic plaque showed no significant difference; \( \beta_\gamma \) subunit expression in these three groups no significant difference; \( \beta_2 \) Subunits no expression; \( \beta_1, \beta_3, \beta_4, \beta_5 \) Subunit express highest in the normal control group, the weakest in the core part; \( \beta_6 \), \( \beta_\gamma \) Subunits express highest in the atherosclerotic plaque core part, the weakest in the normal control group.

Conclusions Immune proteasome is upregulated in atherosclerotic plaques in the core organisation, so we speculate \( \beta_1, \beta_5 \) subunits in the process of atherosclerotic plaque formation play an impotent role.

GW23-e0172

**REVERSAL OF THE ANTI-PLATELET EFFECTS OF ASPIRIN AND CLOPIDOGREL**

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Objectives Guidelines recommend stopping aspirin and clopidogrel 7–10 days before surgery to allow time for replacement of permanently inhibited platelets by newly released uninhibited platelets. The purpose of this study was to determine the rate of offset of the anti-platelet effects of aspirin and clopidogrel after stopping treatment and the proportion of untreated donor platelets that are required to reverse their anti-platelet effects.

Methods Cohort 1 consisted of 15 healthy subjects who received aspirin 81 mg/d or clopidogrel 75 mg/d for 7 days and underwent serial blood sampling until platelet function testing results normalised. Cohort 2 consisted of 36 healthy subjects who received aspirin 325 mg/d, clopidogrel 75 mg/d, aspirin 81 mg/d plus clopidogrel 75 mg/d or no treatment for 7 days and underwent a single blood sampling.

Results In cohort 1, Arachidonic acid (AA)-induced light transmission aggregation (LTA) returned to baseline levels in all subjects within 4 days of stopping aspirin, coinciding with partial recovery of plasma thromboxane B2 concentrations. ADP-induced LTA did not return to baseline levels until 10 days after stopping clopidogrel. In cohort 2, AA-induced LTA in patient treated with aspirin reached control levels after mixing with 30% untreated donor platelets whereas ADP-induced LTA in patients treated with clopidogrel reached control levels only after the addition of 90% or more donor platelets.

Conclusions Platelet aggregation recovers within 4 days of stopping aspirin but clopidogrel must be stopped for 10 days to achieve a normal aggregatory response.

GW23-e2681

**THE EFFECTS OF TELMISARTAN ON SERUM LEVEL OF CPEPTIN IN PATIENTS WITH CHRONIC HEART FAILURE**

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Objectives To study the effects of telmisartan on serum level of copeptin in patients with chronic heart failure (CHF).

Methods 72 patients with CHF were divided into CHF control group (n=40) and CHF treatment group (n=32), and another 30 healthy adults were selected as normal control group. Patients in the CHF control group were given conventional medicine treatment such as digoxin, diuretics, nitrates and so on. Patients in the CHF treatment group were given orally telmisartan (30 mg/day) for 6 months besides conventional medicine treatment. Left ventricular end-diastolic diameter (LVEDD), left ventricular ejection fraction (LVEF), the level of high sensitivity C-reactive protein (hs-CRP) and copeptin were evaluated in all subjects before and after treatment.

Results

1. Compared to those in the normal control group, LVEDD, LVEF hs-CRP and copeptin were significantly different (p<0.05) in the both CHF control group and CHF treatment group before treatment, and LVEF is negative related to level of copeptin (R=-0.38, p<0.05).

2. Although there was no change for LVEDD (p>0.05) after treatment for 6 months in the both CHF control group and CHF treatment group, LVEF were improved (p<0.05) and hs-CRP and copeptin were significantly decreased (p<0.05).

3. After treatment for 6 months, LVEF was higher and hs-CRP and copeptin were significantly lower (p<0.05) in the CHF treatment group compared to those in the CHF control group.

Conclusions Telmisartan can improve heart function of patients with CHF by decreasing serum level of copeptin and alleviating inflammatory reaction.

GW23-e1629

**CORRELATION OF CARDIAC TROPONIN I WITH VENTRICULAR ARRHYTHMIA AND LATE PROGNOSIS IN THE PATIENTS WITH CHRONIC HEART FAILURE**

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Objectives TO investigate correlation of cardiac troponin I (cTnI) with ventricular arrhythmia and late prognosis in the patients with chronic heart failure (CHF).

Methods The levels of serum cardiac troponin I (cTnI) of 174 patients with chronic heart failure (CHF) were detected. The patients were divided into two groups: cTnI-positive group with serum cTnI ≥0.16 ng/ml (n=78) and cTnI-negative group with serum cTnI<0.16 ng/ml (n=96). Ventricular arrhythmia was assessed by 24 h Holter monitoring in two groups. The incidence of adverse cardiac events, re-hospitalisation mortality during the period of in-hospital and the 6 months of out-of-hospital were observed and followed up.

Results Mean hourly number of single ventricular premature beats, Mean hourly ventricular pairs, and the frequency of ventricular tachycardia episodes per 24 h in cTnI-positive group were significantly higher than those in cTnI-negative group (all p<0.01); during the period of observation and follow-up, the incidence of adverse cardiac events, re-hospitalisation and mortality of patients in cTnI-positive group were significantly higher than those in cTnI-negative group (all p<0.05).

Conclusions Serum cTnI levels correlated with ventricular arrhythmia and late prognosis, which could be used as a prognosis predicting for patients with CHF.
GEOMETRIC ERRORS OF THE PULSED DOPPLER FLOW METHOD IN QUANTIFYING DEGENERATIVE MITRAL VALVE REGURGITATION: A THREE-DIMENSIONAL ECHOCARDIOGRAPHY STUDY

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Objectives To ascertain the geometric errors of the two-dimension pulsed Doppler flow (2D PDF) method in calculating the regurgitant volume (RVol) and effective regurgitant orifice area (EROA) in degenerative mitral regurgitation (MR) by comparing it to the 3D PDF method.

Methods We performed 2D transthoracic and 3D transesophageal echocardiography in 22 patients with moderate to severe degenerative MR. The RVol and EROA were calculated conventionally using the 2D PDF method. Using the 3D PDF method, the cross-sectional areas (CSAs) of the mitral annulus (MA) and left ventricular outflow tract (LVOT) were measured directly in the 3D ‘en face’ views.

Results The 2D diameter of the MA was 38±5 mm and that of the LVOT was 22±2 mm. Both the MA and LVOT were oval in the 3D ‘en face’ views with a significant difference between the major and minor diameters (MA: 40±5 vs 30±4 mm; LVOT: 29±4 vs 21±2 mm; both p<0.001). The 2D diameters of the MA and LVOT were significantly different from their major and minor diameters (all p<0.05). Compared with the 3D measurements, the 2D measurements on average overestimated the CSA of MA by 13%±12% and underestimated the CSA of LVOT by 23%±10%. The RVols were: 92±44 ml (3D PDF) vs 138±58 ml (2D PDF), the EROAs were: 67±53 mm² (3D PDF) vs 95±46 mm² (2D PDF) (both p<0.05). Although well correlated between the 3D PDF and flow convergence r²=0.84, 3D PDF vs flow convergence r²=0.90), the RVol and EROA were overestimated by the 2D PDF method by 26%±24%, but underestimated by the 3D PDF method by 16%±18%. Bland-Altman analysis showed that there was a smaller bias and tighter limits of agreements between the 3D PDF and flow convergence methods than between the 2D PDF and flow convergence methods. For the RVol, the bias±SDs were 19±37 ml (2D PDF vs flow convergence) and −10±23 ml (3D PDF vs flow convergence). For the EROA, the bias±SDs were 25±47 cm² (2D PDF vs flow convergence) and −15±54 mm² (3D PDF vs flow convergence). The 3D PDF method was generally more reproducible than the 2D PDF method.

Conclusions The traditional 2D PDF method significantly overestimates mitral RVol and EROA because the monoplanar 2D measurements represent the MA major axis diameter and LVOT minor axis diameter, and the assumed circular CSAs of the MA and LVOT are actually oval. The monoplanar 2D measurements and false geometry assumptions of the CSAs of the MA and LVOT result in the SV being overestimated at the MA level and underestimated at the LVOT level. The overestimates can be significantly corrected by the 3D PDF method in which the CSAs of the MA and LVOT are measured directly in the ‘en face’ views.

PREDICTORS OF IN-HOSPITAL MORTALITY IN CONSECUTIVE 901 PATIENTS WITH FIRST ST-SEGMENT ELEVATED MYOCARDIAL INFARCTION AFTER PRIMARY STENTING DURING THESE 7 YEARS: A SINGLE CENTRE RETROSPECTIVE STUDY

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Objectives It is necessary to examine the details about the in-hospital mortality after primary stenting for ST-segment elevated myocardial infarction (STEMI) in the present drug-eluting stent (DES) era by using the various devices such as thrombectomy catheter and distal protection device. Therefore, this single centre, retrospective, and non-randomised study was conducted to clarify the predictors of in-hospital mortality in consecutive 901 first STEMIs in these 7 years.

Methods The incidence of in-hospital mortality was 3.6% (n=32). The percentages of DES, IABP, IVUS, thrombectomy catheter, and distal protection device use were 81.1, 16.0, 96.3, 76.9 and 71.9%, respectively. The incidence of early definite stent thrombosis was 0.53% (n=5). The percentages of LV dysfunction (EF<40%), left main trunk, IABP use, complication of cardiac rupture, Killip classification 3–4, first TIMI-grade flow 0–1, and Rentrop grade 0–1, and the mean values of age, serum Ht at emergent room (ER), serum LDH at ER, serum Cr at ER, serum peak CK-MB were significantly different between in-hospital mortality group and discharge alive group. By multiple logistic regression analysis, complication of cardiac mechanical rupture, Killip classification 3–4, first TIMI-grade flow 0–1, LV dysfunction (EF<40%), and age were the significant predictors of in-hospital mortality. By multiple logistic regression analysis, the value of serum peak CK-MB and age were the predictors of cardiac rupture in the patients with complicated with cardiac rupture.

Conclusions In the present DES era, the incidence of in-hospital mortality was only a few percentages. However, the optimal method besides primary stenting for the STEMI patient with aging and extend infarction needs to be further explored.

DETERMINING THE FOLDING DOMAIN OF LIPID FREE APOA-I IN SOLUTION BY MUTATION

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Objectives Heart disease remains the leading cause of death for both women and men in the USA. High blood pressure and elevated plasma cholesterol are two main risk factors for heart disease and lead to atherosclerosis. Plasma levels of high-density lipoproteins, HDL, are negatively correlated with the incidence of atherosclerosis and the mechanisms of the anti-atherogenic effects of HDL are mainly related to its involvement in the pathways of reverse cholesterol transport (RCT). As the major protein component of HDL, apolipoprotein A-I (apoA-I) plays an important structural and functional role in RCT. In order to examine the folding domains of apoA-I and, the N and C terminal functions, WT and two truncated apoA-I forms D (185–243), D (1−59, 185–243) were expressed in E. coli, purified and studied by Circular Dichroism (CD), fluorescence spectroscopy and DMPC binding kinetics in the lipid free state.

Methods Generation of Expression Plasmids, Expression and Purification of apoA-I WT and Mutant Proteins. Gateway recombination cloning was used to facilitate the construction of the fusion protein expression vector. PCR products were recombinated by Gateway cloning into the donor vector to yield entry clones, then into destination vector to generate fusion expression vectors. The wild type and mutant proteins were overexpressed in E. coli BL21 (DE3) cells. All of the purified proteins and plasma apoA-I
used for the experiments were redissolved into 6 M guanidine hydrochloride (GdnHCl) followed by extensive dialysis against 5 mM sodium phosphate, 0.01% EDTA and 0.02% NaN3, pH=7.4 (FB). Protein concentrations in samples were determined by modified Lowry protein assay.

Circular Dichroism Spectroscopy. CD spectra were measured with an Aviv 62DS or Aviv 215 spectropolarimeter equipped with thermoelectric temperature control (Aviv Associates, Lakewood, NJ). Far-UV ($250$–$185$ nm) spectra were recorded at 1 nm bandwidth and 1 nm step size with 5s accumulation time for each data point at $25^\circ$C (a-Helical Content in Lipid Free State. Normalised far-UV spectra of the plasma, WT and apoA-I variants were used to estimate the a-helical content in the secondary structure of the recombinant proteins. Helical residue numbers were estimated from the a-helical content for each recombinant protein. There was 1% not statistically significant difference in a-helical content between plasma and WT apoA-I demonstrating that the expressed WT apoA-I is well folded and has similar secondary structure to plasma apoA-I in the lipid-free state. The C terminal deletion, D (185–243), caused 8% statistically significant increase in a-helical content. Although 59 residues were deleted, only ~15 helical residues are lost from secondary structure suggesting that the majority of the C terminus of apoA-I (185–243) lacks helical structure in the lipid free state and deletion of the C terminus has little effect on N terminus of apoA-I. This result is consistent with our previous studies. Double deletion of N and C termini D (1–59, 185–243) caused 2% statistically significant increase in a-helical content again consistent with our previous studies. The deletion of 118 residues caused the protein to lose ~38 helical residues. Considering that there are only ~15 helical residues lost on deletion of the C terminus alone, there are ~45 additional helical residues lost from N terminus (1–59). This suggests that either there is very high helical content in N terminal region (~73%) or the N terminal is vital to maintain the whole protein secondary structure. Our previous studies of the (1–44) apoA-I peptide have demonstrated that it is unfolded in aqueous solution confirming that the N terminus is vital to stabilise apoA-I lipid free structure.

Thermal and Chemical Unfolding. Both the plasma and WT apoA-I have Tm=$62^\circ$C further substantiating that the WT apoA-I was well folded and had similar structure to plasma apoA-I. C terminal deletion D (185–243) caused a small (4°C) reduction in Tm compared to WT suggesting a slightly destabilising effect after the deletion of the C terminus. However the DHv increased 15.7 kcal compared to WT suggesting a higher cooperativity during the thermal unfolding perhaps due to deletion of the less structured C terminus. Double deletion of N and C terminal region D (1–59, 185–243) caused a large (24°C) reduction in Tm and DHv (14 kcal) compared to WT suggesting that the N terminus was essential to maintain the structure of apoA-I and deletion of this region decreased the cooperativity during the thermal unfolding, while the C terminus had little effect on the whole structure.

GdnHCl unfolding curves were used to determine the D295g, D12g, and m values. Similar to the thermal unfolding experiments, plasma and WT apoA-I have similar D295g, D12g and m values due to their similar structure. C terminal deletion D (185–243) led to increase in D295g (0.9 kcal/mol) compared to WT apoA-I again suggesting a stabilising effect after deletion of the C terminus, while the D12g showed no significant change. Double deletion of N and C termini D (1–59, 185–243) led to significant reduction in D295g (9.46 kcal/mol) compared to WT apoA-I and also in D1/2, ~0.7 M. Again this suggests that the N terminus of apoA-I is vital to maintain the whole structure while the C terminus seems to have little effect.

Near-UV Spectra. The major contribution to the near-UV spectra comes from the aromatic side chains. WT and plasma apoA-I contain four Trp (W8, 50, 72, 108). Plasma and WT exhibited similar near-UV spectra after normalisation to protein concentration and showed a large negative peak at 292 nm that corresponded to the Trp and a smaller peak at 285 nm that corresponded to the Trp and Tyr, suggesting that the WT and plasma apoA-I had similar tertiary structure. The C terminal deletion D (185–243) mutant still processed all four Trp, and showed similar near-UV spectra after normalisation to protein concentration to WT and plasma apoA-I but with deeper peaks at 292 nm and 285 nm. Since the four Trp are located within the first 184 amino acids, deletion of the C terminus did not change the Trp packing environment. Rather it increased the Trp signal in the near-UV spectra suggesting a more rigid environment of the Trp. This suggests that deletion of C terminus did not change the N terminal tertiary structure but made it more compact and that the N terminal structure might represent an independent folding domain. Double deletion of N and C termini D (1–59, 185–243) changed the near-UV spectra significantly, maybe due to loss of two Trp (W8, 50) and/or lack of the defined tertiary structure after the stabilising N terminal has been deleted.

ANS and Trp Fluorescence. Fluorescence of ANS in the presence of the lipid-free WT and variant forms of apoA-I was measured to determine if the mutations affect the exposure of hydrophobic surfaces or cavities of apoA-I. The intrinsic fluorescence of ANS has been shown to be enhanced and blue shifted upon binding to hydrophobic surfaces or cavities, while the water-phase dye does not contribute to the emission. In phosphate buffer, ANS fluorescence has a very low intensity and an emission maximum at 517 nm. In the presence of bovine serum albumin that functions as a fatty acid transporter and has multiple hydrophobic binding pockets, there is a significant (41 nm) blue shift and almost 11 fold enhancement in ANS fluorescence compared to the ANS in phosphate buffer alone. In the presence of plasma or WT apoA-I, ANS emission shows a 40 nm blue shift and ~4.7 fold increase in the intensity compared to the ANS in the buffer alone. In the presence of C terminal deletion D (185–243) apoA-I, ANS emission shows only 27 nm blue shift and ~2.2 fold increase in the intensity compared to the ANS in the buffer alone. This suggests the C terminus of apoA-I has exposed hydrophobic surface and probably lacks defined secondary structure in lipid-free state. In contrast to this region, the N terminus is well packed and the hydrophobic surface is well shielded consistent with the CD data. Double deletion of N and C termini, D (1–59, 185–243) apoA-I, results in ANS emissions that show 41 nm blue shift and ~5.8 fold increase in the intensity compared to the ANS in the buffer alone. Thus deletion of the N terminus of apoA-I exposed more hydrophobic surface than WT, again suggesting the N terminus of apoA-I is vital to main the N terminal domain compact structure and deletion of the N terminus will cause the compact structure to open and expose hydrophobic surface to the solution.

Interaction with BOG. BOG has been widely used as a mild lipid mimicking detergent to induce and stabilise the amphipathic a-helical structure during protein crystallisation. The CMC of BOG at 25°C is 20–25 mM. a-Helical content of both plasma and WT apoA-I increased from ~50% to ~69% as the BOG concentration increased from 0 mM to 50 mM and reached the maximum near the BOG CMC concentration 25 mM. This suggests that BOG can bind plasma and WT apoA-I and induce the a-helical structure by ~10%. This further demonstrates that the expressed WT apoA-I has similar structure to plasma apoA-I, a-Helical structure induction by BOG was not observed for the C-terminal deletion form of apoA-I, suggesting BOG maybe bind with the C terminus of apoA-I and induce the helical structure reaching maximum effect after BOG forms micelles. Most interestingly, D (185–243) lost ~5%
helical content at the CMC, suggesting that BOG may disrupt the more compact structure in the N-terminal domain by binding with the exposed non-structured region and affecting the structured region. Double deletion of N and C termini D (1–59, 185–243) may result in more easy to access by the BOG due to lack of defined tertiary structure and a helical content can be induced from ~50% to ~60% with no clear requirement for micelle formation.

DMPC Turbidity Clearance. Association of lipid free apoA-I with DMPC multilamellar vesicles causes a decrease in the turbidity at 325 nm. This process reflects the kinetics of formation of DMPC-apoA-I complexes. Compared to WT and plasma A-I, C terminal deletion D (185–243) decreased the initial rate of clearance of DMPC liposome turbidity dramatically and almost removed the DMPC binding ability completely. This is consistent with data from other laboratories suggesting that deletion the C terminal of apoA-I is vital to initiate the lipid binding process. The double deletion of N and C terminal D (1–59, 185–243) regained the ability to bind with DMPC at similar rate to WT apoA-I, suggesting that deletion of the N terminus causes exposure of lipid binding regions. Combining these results suggests that the C terminus is vital to initiate the DMPC binding and perhaps opens the N terminal folding domain. Deletion of the C terminus does not affect the N terminal domain compact structure or result in a more compact N terminal folding structure. Deletion of the N terminal 59 residues may cause the compact structure to re-open so that DMPC can bind to the hydrophobic surface. This result are consistent with our BOG binding and ANS florescent experiments.

Conclusions WT and plasma apoA-I exhibited similar secondary a helical conformation and thermodynamic characteristics suggesting that they have similar secondary and tertiary structure in lipid free solution. Deletion of the C terminal region, D (185–243), increased a-helical content by 8% compared to WT with increased unfolding cooperativity suggesting that the C terminus of apoA-I lacks defined structure and may interact with the N terminal region (1–184). Similar near UV spectral shape but increased intensity suggests that deletion of the C terminus of apoA-I has little effect on the tertiary structure of the N terminal region. Thus the N terminal region, 1–184, may form an independent folding domain with more compact structure. Significant decrease of ANS binding fluorescence and DMPC clearance further confirms the less exposed hydrophobic surface consistent with a more compact, helical structure of the folding domain. In contrast to the WT, BOG did not induce a-helical formation in D (185–243) suggesting that the hydrophobic regions are well packed in this domain and the C terminus of apoA-I is exposed to solution and lacks defined structure. Further deletion of the N terminal region, D (1–59, 185–243), caused significant decrease in thermal and chemical stability in far UV and significant change in near UV spectral shape suggesting that the N terminal region (1–59) is vital to maintain and stabilise the N terminal folding domain. ANS binding fluorescent, DMPC clearance and BOG helical induction suggest increased exposed hydrophobic surface after deletion of the N terminal 59 residues of apoA-I suggesting an opening of the N terminal domain. In summary, our experiments indicates lipid free apoA-I in solution adopting a more compact independent N terminal domain with buried hydrophobic surface and less structured C terminal region with exposed hydrophobic surface.

GW23-e2686 ARRHYTHMIA ASSOCIATED WITH ACUTE CORONARY SYNDROME: OCCURRENCE, RISK FACTORS, THERAPY AND PROGNOSIS: A SINGLE-CENTRE STUDY

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Objectives Arrhythmia associated with acute coronary syndrome is a common phenomenon. Careful investigation on its occurrence and risk factors in this progressed clinical scenery may lead to further standardisation of therapy and improvement of prognosis. Thus we retrospectively analysed the year-round data of our centre and attempted to provide more information.

Methods Patients admitted to our centre with final diagnose as acute coronary syndrome from January 2007 to December 2007 were enrolled consecutively and analysed.

Results 1. A total of 431 patients were enrolled, with average age of 69 and males accounted for 66.8%, including 98 cases of ST-segment elevation myocardial infarction (STEMI) (22.7%), 109 cases of non-ST-segment elevation myocardial infarction (NSTEMI) (25.5%), 224 cases of unstable angina (UA) (52%). A total number of 99 cases/times of arrhythmia were recorded, accounted for 23% of whole population. Among these were 83 supraventricular tachycardia (19.3%), 41 atrial flutter/fibrillation (9.5%), 49 ventricular premature complex (11.4%), 9 ventricular tachycardia/fibrillation (2.1%), 5 sudden cardiac death (1.2%), 20 sinus bradycardia/junctional escape rhythm (4.6%) and 17 Morbitz II degree and above atioventricular block (3.9%).

2. Significant different incidences of arrhythmia were detected between STEMI, NSTEMI and UA groups (respectively 41.8%, 24.8% and 13.8%, p<0.001). Advanced age (≥65 years old), history of COPD or chronic renal dysfunction, complicated with infection, respiratory failure, elevation of cardiac injury biomarkers and symptomatic cardiac dysfunction were associated with increased incidence of arrhythmia (all p<0.05). In Logistic analysis, advanced age (≥65 years), elevation of cardiac injury biomarkers and symptomatic cardiac dysfunction were independents risk factors of arrhythmia (adjusted OR, 95% CI 2.203 (1.231 to 3.941), p=0.008; 2.998 (1.777 to 5.059), p=0.000; and 4.422 (1.944 to 10.058), p=0.000).

3. Compared with patients without arrhythmia, ACS patients with arrhythmia were older, more of whom have history of chronic renal dysfunction, COPD, and more complicated with infection, respiratory failure. Further, they were more suffered from abnormal left ventricular wall motion, more received revascularisation, IABP, mechanical ventilation and temporary transvenous pacemaker support (all p<0.05). The proportion of aspirin and β-blocker therapy were lower, whereas proportion of tirobifan, dopamin, dobutamin, digitalis, nitroprusside, nitrates and diuretics therapy were higher (all p<0.05). When discharge from hospital, fewer these patients received aspirin, ACEI/ARB, but more received diuretics (all p<0.05). Length of stay in hospital were extended for about 5.4 days (p=0.004).

Conclusions Arrhythmias associated with ACS are common, and may be relate to more complicated comobidity and more severe impairment of myocardium, all of which indicated a more feeble clinical status and lead to a poorer prognosis. With advancement of modern techniques, we now provide more support to these patients. However, standardised chronic medicine treatment such as β-blocker and/or ACEI/ARB with evidence to improve prognosis were underused. More attention should be paid to these patients to improve their treatment and prognosis.
Cardiovascular-disciplinary research

Cerebrovascular disease

GW23-e2691 | HEART RATE VARIABILITY AND SUBJECTIVE RESPONSES IN PATIENTS WITH STROKE: INFLUENCE OF POSTURES AND RESISTIVE EXERCISES

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Objectives Stroke survivors experience the loss of muscle mass and muscle atrophy changes on the paretic lower limbs as well as the non-paretic side. Traditional stroke rehabilitation intervention concerned whether the resistive exercise was available and safe for the patient with stroke. This study is aimed to investigate the influence of postures and low intensity strengthening resistive exercises for heart rate variability (HRV) and subjective responses in the patients with stroke.

Methods Thirteen participants (eight men, five women; aged 50–70 years) were recruited. Registry eligibility criteria included: (1) clinical stroke diagnosis consistent with the WHO definition, confirmed by clinical assessment or imaging. (2) 3–6 months after onset of first stroke. (3) Mini-Mental Status Exam score larger than 16. The experimental protocol was to carry out a different posture and two intermittent elastic resistive exercise training. Postures and band grades (Yellow and Blue Thera-Band bands) were randomised in each participant. Participants were required to perform the knee extension with 100% elongation band exercises at supine or sitting posture. There were 5 min resting periods after four resistive exercising training tasks. HRV signal was collected utilising the Polar heart rate monitor (Polar Electro, Finland). The signal processing of HRV were performed in fast Fourier transforms (FFT) using a HRV analysis software (Kubios HRV, Electro, Finland). The signal processing of HRV were performed in fast Fourier transforms (FFT) using a HRV analysis software (Kubios HRV, Electro, Finland). The signal processing of HRV were performed in fast Fourier transforms (FFT) using a HRV analysis software (Kubios HRV, Electro, Finland).

Results We performed the repeated measure ANOVA to examine the variables among four condition tasks included two postures and two grade resistive exercises. The results indicated that there were significant interactions for LF/HF ratio of HRV (F (1, 12)=9.536, p=0.013), RPE (F (1, 12)=13.656, p=0.002), and anxiety level (F (1, 12)=10.543, p=0.004) during four task conditions. There were no significant responses for LF/HF ratio, RPE, and anxiety level during all resting periods. Paired t-test was also computed to compare the differences among four task conditions. The results were shown that there was significant higher response for RPE (p=0.043) and anxiety level (p=0.026) than other task conditions during higher workload (Blue band) at sitting posture. To compare the responses during resting periods, there were no significant differences for all variables.

Conclusions This study results suggested that intermittent elastic resistive exercise can induce different HRV responses at LF/HR ratio and subjective responses but no significant cumulative effects after the following rests. Short-term low intensity strengthening exercises in sitting or supine postures is the feasible programme can be conducted for the patients with stroke under supervision.

GW23-e2711 | PLASMA CYSTATIN C LEVELS AND ITS ASSOCIATION WITH ANGIOGRAPHICALLY DOCUMENTED CORONARY ARTERY IN PATIENTS WITH NORMAL OR MILDLY IMPAIRED RENAL FUNCTION

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Objectives Concomitant chronic renal impairment (RI) is frequent in patients with cardiovascular disease and substantially increases morbidity and mortality. Even mild RI is associated with an increased cardiovascular risk, and due to the non-linear relationship between Creatinine (Cr) levels and Glomerular filtration rate (GFR), Cr is unreliable for detecting small reductions in GFR and mild RI. Cystatin C, a cysteine protease inhibitor, is novel marker for renal function that is very sensitive and specific for GFR estimation. Plasma Cystatin C (PCyC) levels are less influenced by age, gender, race, drugs and muscle mass as compared to Cr and estimation of PCyC levels is known to be a better indicator of mild RI which may not be detectable by Cr measurement. The objective of this study was to compare the utility of cystatin C in patients with manifest CAD, with normal or only mild RI merits further investigation, especially in the developing world, where CAD is rising exponentially.

Methods In a prospective study of 150 patients (mean age 57.89 ±9.43 years, 86% males) undergoing coronary angiography, PCyC levels were measured using particle-enhanced nephelometric immunoassay (PENIA) method (N Latex Cys-C, Dade Behring, Deerfield, Illinois) while estimated GFR (eGFR) was calculated from MDRD (Modification of Diet in Renal Disease) study equation. Patients with significant valvular or other structural heart disease, severe symptomatic heart failure, life-threatening arrhythmias, acute and chronic liver disease, infectious, auto-immune and chronic inflammatory disease, cancers and on any form of renal replacement therapy, were excluded.

The mean serum Cr of the cohort was 1.14±0.56 (range 0.64–5.59 mg/dl) while mean e-GFR was 70.97±18.86 ml/min/1.73 m² (range (11.25–114.38). Forty of 150 (26%) patients had renal impairment (RI, e-GFR <60 ml/min/1.73 m²), of these 37 had eGFR 30–60 ml/min/1.73 m² while 3 had eGFR <30 ml/min/1.73 m². The mean PCyC levels were 1.8±0.72 mg/l (0.51–6.87 mg/l); expectedly patients with RI had significantly higher mean PCyC levels (2.11±1.11 mg/l) as compared to those with normal eGFR (1.56±0.35 mg/dl, p<0.001).

Categorising the patients into two groups according to the median PCyC levels ≥/<1.45 mg/l revealed that those with higher PCyC levels were older, had higher mean number of diseased coronary vessels, more frequently had triple vessel disease (TVD, 41.2% vs 32%) and diffuse CAD (69% vs 54%, p=0.04) on angiography. The prevalence of hypertension, diabetes, smoking and clinical pattern of presentation of CAD were similar amongst the two groups. Patients with PCyC >1.45 mg/dl had a 1.7 times higher Relative risk of having TVD (95% CI 0.89 to 3.56, p=0.04) and a 1.9 times higher RR of having diffuse CAD on coronary angiography (95% CI 0.96 to 3.65, p=0.04).

This association of higher PCyC levels with CAD remained robust even in patients with normal eGFR (n=110). Amongst these patients the median PCyC levels were 1.36 mg/l; patients with PCyC levels>1.36 mg/l had higher incidence of TVD (46% vs 30%) and diffuse angiographic CAD (71% vs 51%, p<0.03) and higher mean number of diseased coronary vessels. The prevalence of hypertension, diabetes, smoking and clinical pattern of presentation of CAD were similar amongst the two groups.

The Relative risk (RR) of having Triple vessel disease or diffuse CAD on coronary angiography in the 1.91 and 2.3 respectively in
those with PCyC levels;> than the median levels.

**Results** In this study of Indian patients with angiographically documented CAD, higher PCyC levels were associated with more severe CAD. The association of PCyC with severe CAD remains robust even in patients with normal or mildly impaired renal function. Higher levels of Cystatin C in patients with more severe CAD suggest its clinical usefulness as a potential biomarker for identification of high risk CAD patients.

**GW23-e2146** EFFECT OF FOLIC ACID SUPPLEMENTATION ON THE PROGRESSION OF CAROTID INTIMA-MEDIA THICKNESS: A META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS

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**Objectives** We conducted a meta-analysis of relevant randomised trials to assess whether folic acid supplementation reduces the progression of atherosclerosis as measured by carotid intima-media thickness (CIMT).

**Methods** This analysis included 2052 subjects from 10 folic acid randomised trials with the change in CIMT reported as one of the end points. Summary estimates of weighted mean differences (WMDs) and 95% CIs were obtained by using random-effect models. Meta-regression and subgroup analyses were performed to identify the source of heterogeneity.

**Results** Our analysis showed that folic acid supplementation significantly reduces the progression of CIMT (WMD: −0.04 mm, 95% CI −0.07 to −0.02, p<0.001), particularly in subjects with chronic kidney disease risk (WMD: −0.05 mm, 95% CI −0.10 to −0.01, p=0.06) but not in subjects who were generally healthy with only elevated homocysteine concentrations (WMD: 0.00 mm, 95% CI 0.01 to 0.01, p=0.85). Furthermore, meta-regression analysis of the data showed that the baseline CIMT levels (p=0.011) and the percent reduction of homocysteine (p<0.001) were positively related to the effect size. Consistently, a greater beneficial effect was seen in those trials with baseline CIMT levels >0.8 mm (WMD: −0.14 mm, 95% CI −0.19 to −0.08, p<0.0001) and a reduction in the homocysteine concentration>30% (WMD: −0.22 mm, 95% CI −0.38 to −0.06, p=0.009). In the corresponding comparison groups the effect sizes were attenuated and insignificant.

**Conclusions** Our findings indicated that folic acid supplementation is effective in reducing the progression of CIMT, particularly in subjects with CKD or high CVD risk and among trials with higher baseline CIMT levels or a larger homocysteine reduction.

**GW23-e1062** APPLICATION OF INTRAVASCULAR ULTRASOUND IN DIAGNOSIS AND THERAPY OF PERIPHERAL ARTERY STENOSIS

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**Objectives** To evaluate the merits of intravascular ultrasound (IVUS) in the diagnosis and vascular Interventions for peripheral artery stenosis.

**Methods** 94 in patients of department of cardiology of Southwest hospital from October 2006 to September 2010 were collected, who were diagnosed with Peripheral artery stenosis, there were 58 males and 36 females in them, ages were form 26 to 77 (58.4±18.3) years. The patients were divide to DSA (Digital Subtraction Angiography, DSA) group (43 patients) and DSA+IVUS group (51 patients), DSA was used in DSA group, DSA and IVUS were both used in DSA+IVUS group, and The outcome of two techniques were compared. Stenting was implemented under the guidance by DSA and IVUS respectively, and the effect of stenting was observed. Ultrasonic examination and CTA were used in follow up after stenting. DSA and IVUS were used when necessary.

**Results** In DSA+IVUS group, 77 vascular stenoses were found by DSA, there were 42 eccentric stenoses and 22 concentric ischemia/reperfusion injury, which could have many mechanisms. Our researches purpose is going to observe the effects of ischemic postconditioning on the expression of bcl-2 and Bax protein in rats following middle cerebral artery occlusion (MCAO) and to prove neuroprotective effect by ischemic postconditioning.

**Methods** A rat model of focal cerebral ischemia/reperfusion injury was established by middle cerebral artery occlusion using modified filament method. Male SD rats were randomised into 3 groups (n=10): sham-operate (sham) group, ischemia/reperfusion (I/R) group and ischemic postconditioning (IP) group.

Ischemic postconditioning was induced by three repeated cycles of carotid artery occlusion for 5 min and reperfusion for 5 min. Rats were Sacrificed at 24 h after reperfusion, Neurological functional deficits were evaluated at 3 h,12 h and 24 h after ischemia/reperfusion. At 24 h after the reperfusion, then infarct size and functional neurological outcome were measured. The brains were obtained for TTC staining and oedema examination and the brains were obtained for bcl-2 and Bax protein expression by immunohistochemistry method.

**Results** Their infarcted brain volumes were measured after 24 h. No infarct were found in the brains of rats in the sham group. The percentage of infarcted brain volumes in the I/R and I/P groups were 42±10%, 27±11%, respectively. The infarcted volumes of I/P groups was reduced compared to the I/R group, and there was significant difference (p<0.01). And brain oedema of rats in IP group decreased compare to that of I/R group (p<0.05). The rats of IP group had better neurological performance than that of I/R group. The expression of Bcl-2 of brain tissues in IP group were markedly increased compare to that of I/R group at all time points. While the expression of bax protein in IP group were markedly diminished compare to that of I/R group.

**Conclusions** The functional neurological outcome was improved and the cerebral infarct size and oedema were reduced by ischemic postconditioning. The expression of Bcl-2 was up-regulated by ischemic postconditioning. While the expression of Bax was down-regulated by ischemic postconditioning that might be associated with the mechanism of ischemic postconditioning protection on brain.
steno

sis in them; 82 vascular stenoses were found by IVUS, there were 63 eccentric plaques and 19 concentric plaques in them. The diameter stenosis rate measured by IVUS (67.1±12.2)% was significant higher than that measured by DSA (54.5±11.4)%, (p<0.05). The area stenosis rate measured by IVUS (89.3±12.3)% was significant higher than that measured by DSA (77.1±13.1)%, (p<0.05). 82 vascular lesions in DSA group were treated by stenting, 53 vascular lesions in DSA group were treated by stenting, all of them were successful accomplished. After 3–48 months’ follow-up, the restenosis rate of DSA group 15.1% (8/53) was signifi-

A PROSPECTIVE STUDY ABOUT THE CARDIAC PERFORMANCE IN THE CHINESE PATIENTS WITH SEPTIC SHOCK: THE SYSTOLIC FUNCTION ASSESSED BY TISSUE DOPPLER IMAGING AND THE BIOMARKERS

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Objectives This study was to analyse evolution of the left ventricular (LV) systolic function assessed by Tissue Doppler imaging (TDI) and its predictive value to the prognosis in Chinese patients with septic shock, and to evaluate the correlation between these parameters and cardiac biomarkers including cardiac troponin I (cTnI) and N-terminal-pro-BNP (NT-proBNP).

Methods This study prospectively recruited 69 patients within 24 h after the onset of septic shock. The clinical variables, cardiac biomarkers and echocardiography data were obtained and analysed on admission (day 1) and at day 2, 4, 7 and 10 or 24 h after the correction of shock. The primary endpoint was 90 days all-cause mortality.

Results The 90 days all-cause mortality which was 40.6% in this study. The survivors had a lower peak myocardial systolic velocity (Sm) which emerged as an independent predictor of the 90 days mortality in the multivariate analysis at day 1. There was no difference in the baseline level of biomarkers. During the mean follow-up period of 4.8 days, NT-proBNP and cTnI decreased significantly and Sm improved significantly in the survivors; the non-survivors showed a significantly increased NT-proBNP, unchanged cTnI and Sm. The biomarkers correlated significantly with Sm and LV EF both in the baseline and in the follow-up only in the survivors. The correlation of NT-proBNP with cTnI remained significant throughout the follow-up period in both groups.

Conclusions LV systolic function assessed by TDI related to the prognosis of patients with septic shock. The level of biomarkers decreased and strong correlations could be found between the biomarkers and LV systolic function in the 90 days survivors after the onset of septic shock.

POOR SLEEP QUALITY IS ASSOCIATED WITH INCREASED RISK OF LEFT VENTRICULAR HYPERTROPHY IN PATIENTS WITH CHRONIC RENAL FAILURE

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Objectives Poor sleep quality, a novel risk factor of cardiovascular diseases (CVD), is highly prevalent in patients with chronic renal failure (CRF). However, the underlying mechanisms between CVD and poor sleep are unclear. This study aimed to explore the relationship between sleep quality and left ventricular hypertrophy (LVH) in patients with CRF and discussed potential effects of poor sleep on cardiac remodelling in this patient group.

Methods Eighty-two Chronic Renal Failure patients (GFR<60 ml/min 1.73 m²) (mean age=46.1±14.4 years, 55 male/27 female) were recruited in this study. The sleep quality was measured by Pittsburgh Sleep Quality Index (PSQI) while blood pressure (BP) was determined by 24-h ambulatory BP monitoring. eGFR were assessed by simplified MDRD equation. The left ventricular end-
diastolic dimension (LVDd), interventricular septum thickness at end-diastole (IVS), LV posterior wall thickness at end-diastole (FWTH) were measured by ultrasonic cardiomography, left ventricular mass index (LVMI) were calculated. Patients were grouped into normal left ventricular (NLV) or left ventricular hypertrophy (LVH) ≥155 g/m² (male) or ≥110 g/m² (female).

Results A total of 36 patients were identified as LVH, with a rate of 49.9%. Univariate analyses showed that patients with LVH had poorer sleep quality (PSQI score: 12.45±4.68 vs 9.57±5.11, p=0.009) and higher ambulatory systolic mean BP (147.3±16.1 vs 134.9±13.1, p<0.001), and lower eGFR (14.56±13.10 vs 27.40±14.58, p<0.001) than patients with normal LV. However, no differences in mean diastolic BP were found between these two groups. Logistic regression analysis revealed that LVH were independently associated with PSQI score, age, sex, and ambulatory systolic blood pressure, ambulatory diastolic blood pressure, BMI, eGFR.

Conclusions Poor sleep quality is an independent risk factor of LVH in patients with chronic renal failure. Our finding implies that the association between poor sleep and CVD might be mediated by cardiac remodelling and improvement of sleep quality might reverse this abnormality and subsequent CVD event.

GW23-e0082 MESENCHYMAL STEM CELLS ATTENUATES VASCULAR REMODELLING IN PULMONARY HYPERTENSION RATS INDUCED BY MONOCROTALINE

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Objectives Intravenous and intratracheal implantation of mesenchymal stem cells (MSCs) may offer ameliorating effects on pulmonary hypertension (PH) induced by monocrotaline (MCT) in rats model. The aim of this study was to explore the anti-remodelling effect of MSCs and whether it is related to the inhibition of Smad axis during PH development.

Methods MSCs were isolated from rat bone marrow. PH was induced in rats by intraperitoneal injection of MCT. One week after MCT administration, the rats received 3 different treatments: intravenous injection of MSCs (VMSCs group), intratracheal injection of MSCs (TMSCs group), and non-treatment (PH group). As the negative control, rats received saline instead of MCT (control group). Pulmonary arterial structure and dynamics, as well as remodelling-associated cytokine Smad2, 3 in the lungs were evaluated 3 weeks after MCT injection.

Results PH group versus control group had higher arterial pressure (PAP) and wall thickness index (WTI) 21 days after MCT treatment. Phosphorylated (p)-Smad2 and ratio of p-Smad2/Smad2 were higher in PH group than control group. Widespread lung distribution of fluorescence labelled MSCs were viewed in VMSCs and TMSCs group rats’ lungs both 3 and 14 days after transplantation, but not found in the media of pulmonary artery. WTI and PAP in both VMSCs and TMSCs groups were significantly lower than the PH group 3 weeks after MCT injection, while p-Smad2 and ratio of p-Smad2/Smad2 were obviously reduced among MSCs treated rats than their counterpart in control group.

Conclusions In conclusion, both intravenous and intratracheal transplantation of MSCs attenuate MCT-induced PH by the induction of therapeutic anti-remodelling, which may be associated with the early suppression of Smad2 phosphorylation via paracrine pathways.

GW23-e2445 PREDICTIVE VALUES OF THE WELLS AND REVISED GENEVA SCORES COMBINED WITH D-DIMER FOR SUSPECTED PULMONARY EMBOLISM IN ELDERLY PATIENTS

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Objectives To compare the predictive values of the Wells and revised Geneva scores combined with D-dimer for suspected pulmonary embolism (PE) in elderly patients, and to explore suitable and simple predictive approaches for PE in elderly patients.

Methods 336 patients who were admitted for suspected PE due to chest pain, dyspnoea, syncope, and haemoptysis were enrolled between January 2006 and April 2011, and they were divided into two groups based on the age ≥65 or <65 years. The main clinical presentation and medical history of patients was recorded, with plasma D-dimer tested and CT pulmonary arteriography performed. The analyses were done as follows: Firstly, the clinical characteristics of the cases of two groups were compared. Secondly, the Wells and revised Geneva scores defined as possible PE for Wells
scores≥4, and impossible PE for the scores ≤applied to evaluate the
diagnostic possibility of PE, and the positive predictive value of
both scores were calculated with CTPA as gold standard. The area
under the curve of ROC were compared to assess the predictive
value of both scores for suspected PE in elderly patients. And
thirdly, the negative predictive value of the test results of the Wells
and revised Geneva scores combined with D-dimer were calculated.

Results 9 cases (28.6%) were definitely diagnosed by CTPA among
the 336 cases admitted for suspected PE (196 aged older than 65,
and 140 aged <65), among which 56 cases (58.3%) were older than
65, and 40 (41.7%) were <65. Clinical characteristics of both
groups were compared, and heart rate and respiratory rate of the
elderly patients were higher than that of the non-elderly (heart
rate: 95.04±19.00 vs 85.90±13.69 beats per minute, p<0.05; respira-
 tion rate: 20.52±3.71 vs 18.93±2.14 breaths per minute, p<0.05),
and with arterial oxygen saturation lower than that of the non-
elderly (92.74±6.21 vs 95.62±3.95%, p<0.05). The positive predictiv-
value of Wells and revised Geneva scores were 65.8%, 32.4%
(p<0.05) in the elderly patients, and 65.6%, 32.4% (p=0.21) in the
non-elderly patients. The negative predictive value of D-dimer, the
Wells score combined with D-dimer, and the revised Geneva score
combined with D-dimer were 95.7%, 100%, and 100%, respectively,
in the elderly patients.

Conclusions Heart rate and respiration rate of the elderly cases
with PE were higher than those of the non-elderly, with arterial
oxygen saturation lower than that of the non-elderly. Different
from the non-elderly cases, the predictive value of the Wells score
was higher than the revised Geneva score for the elderly cases with
suspected PE, and using of the Wells score could reduce the rate of
misdiagnosis. The combination of either the Wells score or the
revised Geneva score and a normal D-dimer concentration is a safe
strategy to rule out PE and could reduce the number of unneces-
sary scans for the elderly cases with suspected PE.

GW23-e0977  THE BASELINE CHARACTERISTICS AND SURVIVAL OF
CHINESE PATIENTS WITH CONNECTIVE TISSUE
DISEASE ASSOCIATED PULMONARY ARTERIAL
HYPERTENSION
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Objectives Pulmonary arterial hypertension (PAH) is a severe com-
pliation of connective tissue disease (CTD) with a poor prognosis.
There have been sporadic reports with respect to the clinical fea-
tures and survival of CTD associated PAH (CPAH), however, those
in Chinese with CPAH are unknown yet. The purpose of this
study is to investigate the baseline characteristics, survival and risk
factors of mortality in Chinese with CPAH.

Methods All consecutive adult patients who visited the three
medical centres with confirmed diagnosis of CPAH between July
2006 and May 2011 were enrolled into the study. For all these
patients, PAH was confirmed by right heart catheterisation.

Results A total of 144 patients (40.6±12.6 years old) were included
in the study and 44% of them were associated with SLE. The other
underlying CTDs, in the descending rank order, are pSS (15%),
Takayasu arteritis (12%), MCTD (10%), SSc (8%) and some others
(RA 3%, FM/DM 2%, adult onset Still’s disease 2%, UCTD 2%,
primary APS 1%, and ANCA associated vasculitis 1%).

The median duration between symptom onset and diagnostic
catheterisation was 16.5 months. At diagnosis, 57.6% of patients
were in WHO functional class III/IV. The 6-min walk distance was
377.0±99.7 m. Mean pulmonary artery pressure was 49.7 ±14.4 mm Hg. Eighty-five percent of patients received vascular-tar-
geted therapy.

One hundred and twenty-nine patients were follow up with a
median duration of 15.8 months (ranged 1.1–55.1 months). The
survival rates of these patients at 1 and 3 years were 87.8% and
53.8%. The survival rates of patients with SLE associated PAH at 1
and 3 years were 90.0% and 57.1%. K-M survival analysis showed
there were no significant differences in the survivals among differ-
ent connective tissue diseases.

Univariate Cox analysis showed shorter 6-min walk distance,
lower cardiac output, cardiac index and mixed venous oxygen
saturation, higher pulmonary vascular resistance (PVR), alkaline
phosphatase (ALP), total bilirubin and direct bilirubin, lower
total cholesterol and low-density lipoprotein were associated
with high risk of death (all p<0.05). Multivariate Cox analysis
showed higher PVR and ALP were independent predictors of
mortality (HR were 1.52 (1.03–1.85) and 1.70 (1.01–2.87) respec-
tively, both p<0.05). K-M analysis demonstrated the survival
rate in PVR<15 wood unit group was higher significantly than
that in ≥15 wood unit group (p=0.009), and the survival rate in
ALP<150 U/l group higher than that in ≥150 U/l group
(p=0.012).

Conclusions SLE was the most common underlying disease of
CPAH in China; however, SSc-associated PAH was fewer in
Chinese patients, which were much different from Caucasians.
The survival of Chinese patients with CPAH at 1 and 3 years
were 87.8% and 53.8%, which were similar with the data of
Western countries. Furthermore, elevated PVR and ALP were
independent risk factors of bad outcomes.

GW23-e2293 EXPRESSION CHANGE OF IKCA CHANNELS IN ET-1
INDUCED PROLIFERATION OF PULMONARY ARTERIAL
SMOOTH MUSCLE CELLS AND MODULATION
MECHANISM
doi:10.1136/heartjnl-2012-302920y.4

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Objectives Pulmonary vascular remodelling is an important patho-
logic feature of Pulmonary hypertension (PH). Pulmonary arterial
smooth muscle cells (PASMCs) increased proliferation is an import-
ant component of pulmonary vascular remodelling. Regulation of
PASMCs proliferation may therefore be critical to pulmonary vas-
cular remodelling in PH, however the underlie mechanisms are still
controversial. However, the precise mechanism of PH still remains
to be elucidated.

Changes to Ca2+-activated potassium channels (KCa) in prolifer-
ating vascular smooth muscle cells (VSMCs) have been described,
but no regulatory role in proliferation has been attributed to them.
KCa channels as a bridge between Ca2+ signal and electrical activa-
tion in excitable cells, including of PASMCs, became more and
more popular in research of hypertension, PH and atherosclerosis.
Intermediate conductance calcium-activated potassium channel
(IKCa) and large conductance calcium-activated potassium channel
(BKCa) are two subtypes of KCa family. In systemic circulation
VSMCs, BKCa channel expression defines the contractile

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phenotype of VSMCs, while expression of IKCa channels characterises proliferating cells. The role of IKCa channel in PASMCs proliferation is unclear.

Rho/Rho kinase signalling pathway plays an important role in various cellular functions which involved in the pathogenesis of PH. Rho/Rho kinase signalling pathway mediates vascular smooth muscle cell contraction and vasoconstriction, the signalling pathway mediates ‘Ca$^{2+}$ sensitisation’ of spontaneously. The upstream signals responsible for activation of Rho/Rho kinase signalling in PH is not is unclear.

To investigate expression change of KCa channel and Rho/Rho kinase signalling pathway in ET-1 induced proliferation of pulmonary arterial smooth muscle cells and to investigate modulation mechanism.

Methods The primary human PASMCs in 5–10 generations were cultured in 37°C with 5% CO$_2$ and incubated with several concentration of ET-1 (0, 10, 100 nmol/l), or co-cultured with ET-1 (10 nmol/l) pretreated with Cliostrimazole (10 µmol/l, IKCa inhibitor), Fasudil (100 nmol/l, Rho kinase inhibitor) or Bosentan (100 nmol/l, inhibitor) respectively for 24 h. After the PASMCs were harvested, we used real time RT-PCR and western blot analysis to evaluate the expression and characteristics of IKCa channels and RhoA. We also used the MTT analysis and flow cytometric analysis to investigate the effects of IKCa channels on cell proliferation and the mechanisms involved.

Results High concentration ET-1 induced cell proliferation in human PASMCs in a dose-dependent manner. The IKCa channels expression of mRNA and protein is up-regulated in ET-1 induced proliferation of human PASMCs in a dose-dependent manner. The RhoA expression of mRNA and protein is up-regulated in ET-1 induced proliferation of human PASMCs in a dose-dependent manner. Inhibition of IKCa prevents ET-1 induced proliferation of human PASMCs. Inhibition of Rho/Rho kinase signalling pathway prevents ET-1 induced proliferation of PASMCs. BKCa channel inhibition fails to prevent ET-1 induced PASMCs proliferation. Inhibition of Rho/Rho kinase signalling pathway prevents up-regulated change of IKCa channel express in ET-1 induced PASMCs proliferation. ET-1 induced cell proliferation model in human PASMCs is a simple and useful cell proliferation model for basic research of PH.

Conclusions There are an up-regulated change of IKCa channels expression and RhoA expression in ET-1 induced proliferation of human PASMCs. There are an ion channel remodelling of KCa channels, which including up-regulated change of IKCa channels expression and down-regulated change of BKCa channels expression in ET-1 induced proliferation of PASMC. IKCa channel inhibition prevents PASMCs proliferation, Rho/Rho kinase signalling pathway may be involved in partially. IKCa channels and Rho/Rho kinase signalling pathway are important in PASMCs cell proliferation, making the channel and the signalling pathway a potential therapeutic target in pulmonary vascular remodelling.

Methods 15 patients with PPH including nine males and six females were included in the study. Clinical features about Symptoms, physical examination findings and laboratory test results were evaluated.

Results Dyspnoea was seen in 15 patients (100%), accentuated P2 in 10 patients (66.7%), systolic murmur of tricuspid area in 12 patients (80%), PaO$_2$ <70 mm Hg in 15 patients (100%), with an average of (53.6±3.3) mm Hg. X-ray showed prominent pulmonary artery segment in 11 patients (73%), ECG with leads V1 R/S>1 in 9 patients (100%), increase in right ventricular diameter of 10 patients (66.7%), right ventricular anterior wall thickening in 6 patients (40%). Child-Pugh Classification A of five cases, with an average of (64.4±8.1) mm Hg in PaO$_2$ and (53.6±8.4) mm Hg in pulmonary arterial systolic pressure. Child-Pugh Classification B of three cases, with an average of (60.7±8.4) mm Hg in PaO$_2$ and (68.3±12.6) mm Hg in pulmonary arterial systolic pressure. Child-Pugh Classification C of seven cases, with an average of (58.6±9.3) mm Hg in PaO$_2$ and (75.7±16.4) mm Hg in pulmonary arterial systolic pressure.

Conclusions Dyspnoea is an important clinical manifestation in PPH patients. Accentuated pulmonary second heart sound is the common features of pulmonary hypertension. X-ray, electrocardiogram could also show the increase of pulmonary arterial pressure. Our results suggest that the severity of PPH increases with lower blood oxygen pressure, as the liver function (Child Pugh classification higher) gets worse in elderly patients with portal hypertension.

GW23-e2059 THE USE OF RETEPLASE IN PATIENTS WITH PULMONARY EMBOLISM RETEPLASE AFTER HAEMODYNAMIC CHANGES doi:10.1136/heartjnl-2012-302920y.6
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Objectives To explore the clinical effect of reteplase in the emergency use of thrombolytic therapy in patients with pulmonary embolism after haemodynamic changes.

Methods The patients with pulmonary embolism were confirmed by clinical symptoms and 520-slice spiral CT. After respiration, blood pressure and other haemodynamic changes, 20 mg reteplase was used by a slow bolus two times with the intervals 30 min after the dilution. The haemodynamic changes and clinical symptoms were detected, while monitoring the hemagglutination application of heparin sodium into the continuous intravenous infusion.

Results From December 2008 to January 2012, all patients with pulmonary embolism were confirmed by 320 row spiral CT in our hospital diagnosis of pulmonary embolism. 18 cases of the patients were selected to use reteplase to thrombolysis in the emergency application after haemodynamic changes appeared in them. At 6 h after thrombolysis, chest pain and dyspnoea was significantly improved in 12 cases (66%); blood pressure, heart rate, breathing restored normal within 24 h in 15 cases (72%); At 2 h after thrombolysis, one patients died in cerebral haemorrhage (5.5%); at 6 h after thrombolysis, four patients whose haemodynamics was not improved, died eventually (22%). At 1 week after thrombolysis, pulmonary three-dimensional imaging examinations showed recanalisation in 15 cases (72%) of patients with stable disease underwent. The rates of recanalisation and mortality in patients with pulmonary embolism were statistically significant (p<0.05).

GW23-e2314 CLINICAL ANALYSIS OF 15 CASES WITH PORTOPULMONARY HYPERTENSION IN ELDERLY PATIENTS doi:10.1136/heartjnl-2012-302920y.5
1Zhang Wei-hua, 2Chen Yang, 3Mai Qi, 4Dui Meihong, 2Zhang Wei-hua.
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Objectives The aim of this study is to summarise the clinical features of PPH of the elderly patients with portal hypertension.
Conclusions When the patients with deep vein thrombosis, lower extremity fracture, surgery, prolonged bed rest, old age, pregnancy and childbirth, obesity, hypertension and other underlying diseases, appeared unexplained dyspnea, chest pain, syncope, transient reduced blood pressure, oxygen partial pressure gradually lower, pulmonary embolism should be suspected. The patients are in critical condition and can lead to death with the rapid development in a short period of time due to circulatory, respiratory system failure. So using the emergency thrombolysis as soon as to pulmonary vascular recanalisation is an effective treatment programme. The patients with pulmonary embolism and haemodynamic changes confirmed in our hospital are given with reteplase to thrombolysis. The drug has the clinical safety, and can significantly relieve symptoms, improve haemodynamic changes and increase pulmonary vascular recanalisation rate. It improves the cure rate of patients and reduce mortality effectively.

GW23-e0349 DISORDER OF IRON METABOLISM IN HYPOXIC PULMONARY HYPERTENSION RATS
doi:10.1136/heartjnl-2012-302920y.7

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Objectives Iron supplement is efficient to inhibit the increase of pulmonary arterial systolic pressure (PASP) induced by hypoxia. And recently, iron deficiency is normally observed in idiopathic pulmonary arterial hypertension (IPAH) patients, while the situation of iron metabolism and its regulatory mechanism under hypoxic pulmonary hypertension (HPH) is seldom known.

Methods 4-weeks hypoxia induced hypoxic pulmonary hypertension (HPH) in 4 rats. Beside blood regular test, blood samples were collected for determination of several factors related to iron metabolism including iron, ferritin, transferrin and hepcidin, which is synthesised in liver and plays a key role in inhibiting iron absorption, release and storage. Furthermore, RNA and protein were extracted from liver tissues to evaluate the transcriptional level of hepatic iron and protein expression of the upstream regulator of hepatic iron, BMP6.

Results WBC (5.73±2.86×10^{9}/l vs 1.60±0.59×10^{9}/l) and MCV (61.28±2.01 fl vs 57.58±2.39 fl) were decreased in HPH rats showed from blood regular test, while RBC, Plt did not change compared with control group. Iron concentration was significantly decreased in HPH rats (12.1±3.43 ng/ml and 8.6±1.50 ng/ml in control rats and HPH rats respectively), while the plasma level of transferrin (0.67±0.13 nmol/l vs 1.02±0.23 nmol/l) and hepcidin (5.87±0.50 ng/ml vs 7.72±0.75 ng/ml) were increased. Plasma level of ferritin was also significantly increased in liver.

Conclusions Dysfunction of iron metabolism in HPH rats was observed and an up-regulated BMP6/hepcidin signalling pathway in liver may contribute to this progress. BMP/SMAD-hepcidin signalling may play a critical role to regulate iron metabolism in HPH and iron supplement may be a potential treatment for HPH patients

GW23-e0806 ID PROTEINS IS INVOLVED IN VASCULAR REMODELLING IN HYPOXIA-INDUCED PULMONARY HYPERTENSION RATS
doi:10.1136/heartjnl-2012-302920y.9

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Objectives Previous research have suggested that Id proteins may play an important role in pulmonary hypertension (PH), but its exact role in hypoxia induced PH is seldom known. The present study is aim to study the role of Id1 and Id3 and the underlying mechanism in vascular remodelling of hypoxia induced pulmonary hypertension rats.

Methods Sprague Dawley rats were kept under hypoxia condition for 4 weeks to induce pulmonary hypertension. Id1 and Id3 expression in pulmonary arteries were detected by western blot and immunohistochemistry. The role of Id proteins in hypoxia induced proliferation of PASMcs was determined by Id gene siRNA knock down. Furthermore, the potential role of p21 and p27 was assessed after Id gene siRNA knock down to investigate the impact of Id proteins on cell cycle regulation.

Results Id1 and Id3 expression was significantly decreased in pulmonary arteries from hypoxia induced PH rats. Hypoxia induced knock down-regulation of Id1 and Id3 expression. while the proliferation of PASMcs induced by hypoxia was abrogated after Id gene silence. Id1 and Id3 were involved in p21 and p27 regulation under hypoxia as p21 and p27 expression was up-regulated by hypoxia after siRNA silencing of Id1 and Id3.

Conclusions Id1 and Id3 may play an important role in hypoxia induced vascular remodelling in rats. The effect of Id proteins on p21 and p27 expression was in proliferation regulation of PASMcs.

GW23-e0726 GENOMIC CHARACTERISTICS OF ADHESION MOLECULES IN PATIENTS WITH SYMPTOMATIC PULMONARY EMBOLISM
doi:10.1136/heartjnl-2012-302920y.8

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Objectives To find out the differences of cell adhesion molecule-related mRNAs expression between symptomatic pulmonary embolism (PE) and control group, and to investigate the interactions among activated leukocytes, platelets and endothelial cells.

Methods Whole human gene chip was applied to detect cell adhesion molecule-related mRNAs expression in symptomatic PE and control group, and then statistical analysis was performed.

Results In patients with PE, the expression of most mRNAs related to integrins which located in leukocytes and platelets was significantly up-regulated; the expression of mRNAs related to P-selectin and E-selectin glycoprotein ligand was significantly up-regulated; while the expression of mRNA related to L-selectin was significantly down-regulated; the expression of mRNAs related to classic cadherins and protocadherins tended to down-regulate as a whole, and the expression of mRNA related to vascular endothelial cell cadherin was significantly down-regulated; the expression of mRNAs related to the immunoglobulin superfamily had no obvious difference between the two groups.

Conclusions The results demonstrated that, in symptomatic PE patients, the adhesion of leukocytes and platelets were enhanced; the activation of endothelial cells was obviously weakened; the adherens junctions among endothelial cells were weakened, with the endothelium becoming more permeable.
Peripheral vascular disease

CLINICAL RESEARCH OF ANGIOPLASTY AND STENT IMPLANTATION IN THE TREATMENT OF LOWER LIMB ATHEROSCLEROSIS OBLITERANS

Objective To assess efficacy and safety of angioplasty and stent implantation in the treatment of lower limb atherosclerosis obliterans.

Method 20 patients (34 lesions) with lower limb atherosclerosis obliterans were treated by angioplasty and stent implantation, which 18 cases occlusion in iliac artery, 12 cases in femoral poalereal artery and four cases in inferior genicular artery. The iliac artery and femoral poalereal artery lesions were first carried out balloon angioplasty, if there is mezzanine or residual stenosis >30%, then stenting; the inferior genicular artery lesions only were carried out balloon angioplasty. Followed up for 6 months and 12 months to assess of restenosis and clinical efficacy.

Result All the patients' therapy was successful, their clinical symptoms were improved or disappeared. 6-month follow-up revealed restenosis rates in the iliac artery and femoral poalereal artery, inferior genicular artery were respectively 5.5%, 16.7%, 25%; 12-month follow-up revealed restenosis rates were respectively 11.1%, 33.3%, 75%.

Conclusion angioplasty and stent implantation are safe and effective in treatment of lower limb atherosclerosis obliterans. standardized postoperative anti-platelet, anticoagulant, anti-lipid therapy is essential for maintaining blood vessel recanalisation.

APPLICATION OF WAVE INTENSITY AND ECHOTRACKING TO EVALUATE CARDIOVASCULAR FUNCTION CHANGES IN PATIENTS WITH MYOCARDIAL INFARCTION

Objective to evaluate the changes of cardiovascular function and its clinical significance in patients of myocardial infarction (MI) with Wave intensity (WI) and Echo-tracking (ET) technique

GW23-e1138

ABSTRACTS

Peripheral vascular disease

CLINICAL RESEARCH OF ANGIOPLASTY AND STENT IMPLANTATION IN THE TREATMENT OF LOWER LIMB ATHEROSCLEROSIS OBLITERANS

doi:10.1136/heartjnl-2012-302920z.1

Peng Jin, Chi Luxiang. 187th Hospital of Chinese people’s Liberation Army; Southwest Hospital, Third Military Medical University

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APPLICATION OF WAVE INTENSITY AND ECHOTRACKING TO EVALUATE CARDIOVASCULAR FUNCTION CHANGES IN PATIENTS WITH MYOCARDIAL INFARCTION

doi:10.1136/heartjnl-2012-302920z.4

Yong Xu, Jun-song Liu, Guang Zhi, Jing Wang, Shu-lin Ou, Xiao Zhou, Yong Xu.

Objective to evaluate the changes of cardiovascular function and its clinical significance in patients of myocardial infarction (MI) with Wave intensity (WI) and Echo-tracking (ET) technique

GW23-e1272

AN ASSESSMENT OF INTRACA VITY COVERED STENT TREATMENT IN 84 AORTIC DISSECTION PATIENTS

doi:10.1136/heartjnl-2012-302920z.3

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Objective To ummarise the experiences of applying intracavity covered stent to treat Debakey III type aortic dissection, and to find out causes and solutions of various kinds of complications.

Method The 84 patients were received intracavity covered stent treatments in our hospital between January 2006 and November 2011, of which 75 patients were Debakey III type aortic dissection, and nine patient were penetrated aortic ulcer. There are 79 males and 5 females, and the average age is 52.3 years. Six of them were treated with branchened stents due to the distance from aortic dissection cleavage to left subclavian artery were less than 10 mm, 20 patients were with straight stents, and the else 64 patients choosed feather-thinning stents. All patients were instructed to assess the therapy effects and observe complications by means of CTA 3 months and every year after the operation.

Result The instant success rate of the operations in 84 patients is 100%. Two patients were dead in perioperative period, and one patient gained a suffering from paraplegia, in one patient the stent fell into false lumen and an internal leakage was emerging during the stent releasing process and this problem was resolved by implanting a new stent in proximalis of the aorta, and in another one patient it was observed a symptom of subclavian blood stealing which was gradually fading away. During the follow-up visiting of 25.5±11.2 months, three patients were dead, two patients were discovered an internal aorta leakage (14.2%) and this syndrome in eight patients naturally disappeared along the time (66.7%), in one patient a new dissection appeared 2 months after the stent implantation and then a second stent was successfully placed, three patients took aneurysmal dilatations in distal end of the aorta, the else patients had been failed to find out obvious complications such as retrograde aortic dissection, spinal cord injury, stent position shifting, and symptom of subclavian blood stealing.

Conclusion The intracavity covered stent treatment is an effective method for the therapy of Debakey III type aortic dissection, at the same time the occurrences of various kinds of complications especially the sereve ones should be prevented ahead.
Methods 59 patients with coronary artery disease diagnosed by coronary angiography were divided into 2 groups, A group of stable angina pectoris (n=38) and B group of myocardial infarction (n=21), these two groups and 27 healthy people were examined by WI, ET and routine examinations, the parameters of these groups were made comparison and linear correlation analysis

Results Compared with the normal group the elasticity modulus (Ep), stiffness parameter (β) and pulse pressure (PP) increased in A group; The intima media thickness (IMT) increased in two groups while B group became more thick. WI W2 and NA decreased in B group compared with A group. In correlation analysis, W1 has significant positive relationship with W2, SBF, β, Ep and one-point pulse wave velocity (PWVβ) while having negative relationship with R-W1; W2 correlated positively with NA, PP; NA also have positive relationship with PP.

Conclusions wave intensity and Echo-tracking are effective non-invasive and simple ultrasonic techniques to evaluate the changes of cardiovascular function in patients with myocardial infarction which has clinical application value

GW23-e1065 CURATIVE EFFECT OF ENDOVASCULAR THERAPY ON TAKAYASU ARTERITIS
doi:10.1136/heartjnl-2012-302920z.6
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Objectives To observe the curative effect of endovascular therapy including percutaneous transluminal angioplasty (FTA) and PTA plus stenting on Takayasu arteritis (TA).

Methods Forty-eight inpatients with TA (17 males and 31 females) at the age of 19–53 years (mean 27.6±18.1 years), who underwent endovascular therapy (FTA only or PTA plus stenting) in Department of Cardiology, Southwest Hospital, Third Military Medical University (Chongqing, China) from January 2002 to May 2009, were enrolled in this study. Treatment outcome and data including erythrocyte sedimentation rate, C-reactive protein, CTA, MRA, Doppler vascular ultrasound findings obtained during a follow-up period of 42.8 months were analysed.

Results A total of 180 lesions were detected in the 48 patients by angiography. Of the 101 lesions that underwent endovascular therapy, 29 were found in subclavian artery and arteria innominata, 28 in carotid, 34 in renal artery, 2 in pulmonary, and 8 in coronary artery, respectively. Good revascularisation was achieved in all these lesions. No residual stenosis occurred in 76 lesions (75.2%) with only minimal residual stenosis observed in 25 patients (24.8%). Restenosis was observed in three lesions (12.0%) after treatment with PTA only and in five lesions (6.5%) after treatment with PTA plus stenting during the follow-up period of 3–6 months. No significant complication occurred in all recurrent stenoses after endovascular therapy.

Conclusions Endovascular therapy including simple FTA or PTA plus stenting is a safe and effective treatment modality for chronic inactive TA.

GW23-e1063 CLINICAL APPLICATION OF DIFFERENT CEREBRAL PROTECTION DEVICES IN CAROTID ANGIOPLASTY AND STENTING IN 1148 PATIENTS WITH CAROTID STENOSIS
doi:10.1136/heartjnl-2012-302920z.7
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Objectives To investigate the efficacy and safety of Carotid angioplasty and stenting (CAS) by different cerebral protection devices in 1148 patients with carotid stenosis.

Methods Carotid angioplasty and stenting by different cerebral protection devices were performed in 1148 patients with carotid artery stenosis from April 2003 to June 2007. There were 812 males and 336 females in all patients. Age were from 56 to 84 (average 68±5). Transient ischaemia attack (TIA) occurred in 894 patients, and cerebral infarction (CI) occurred in 254 patients. 854 Angioguard (Cordis, Co.), 350 Spide (EVS, Co.), 25 Filterwire (Boston Scientific, Co.), 16 Emboshield (Abbott, Co.), 8 MoMa (Invotech, Co.) and 2 Aether (MicroFort, Co.) were used in CAS.

Results 1255 cerebral protection device were successfully placed in internal carotid arteries with 1148 patients, 8 MoMa were placed respectively in external and common carotid artery. Predilations
were performed in 18 patients by Angioguard because of severe carotid stenosis. Cerebral protection device disruption occurred in one patient during retrieve of Spide. The mean diameter of carotid stenosis was from (87.6±6.8)% to (18.9±10.8)% after CAS one patient during retrieve of Spide. The mean diameter of carotid arteries were performed in 18 patients by Angioguard because of severe ischaemia and prevent ischaemic stroke.

**Psychology**

**GW23-e2187 ONE CASE REPORT OF DEPRESSION CHARACTERISED BY ANOREXIA ANGULAR WITH FLUPENTIXOL AND MELITRACEN TREATMENT**

doi:10.1136/heartjnl-2012-302920aa.1

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**Objectives**

1. Clinical Data: The patient, female, 68 years old, came to our hospital with symptoms of anorexia, angular, lack of power with depression and fidgety for 6 months. No abnormalities were observed by electrocardiogram (ECG), chest x-ray, abdominal ultrasound and gastroscopy examination. Blood analysis showed slightly microcytic anaemia and bone marrow puncture examination showed iron-deficiency anaemia. It was lack of efficacy after taking tinctum, lactic acid bacteria bacteriocin piece, JinShuangQi and the traditional Chinese medicine for spleen and stomach health. Physical examination: Blood pressure was 128/80 mm Hg, breathing was 15 times/min, and she had sluggishness. There were scaphoid abdomen, no hepatosplenomegaly, no tenderness and normal peristaltic sound. Liver and kidney function, blood glucose, lipids and electrolytes were normal. Tumour antigen was negative. The 64-slice CT of head, chest and abdomen were normal. The psychiatrists gave psychological evaluation with anxiety scale (HAMA) and depression scale (HAMA-17) after consultation. HAMA-17 scale was 28 points and HAMA scale score was 20 points, which be interpreted as moderate depression and mild anxiety. After that, the patient was added flupentixol and melitracen one tablet every morning in addition to conventional iron supplement and vitamin. The mental state, mood and sleep of patient were better than before the next day, the patient feel hungry, and appetite increased significantly. The patient continued to taking iron supplements, vitamin and flupentixol and melitracen after discharge. Follow-up after 1 month showed that the spirit, appetite, sleep, emotional and physical strength of the patient were normal, and weight gain 5 kg. Follow-up after 2 months showed that the patient felt better, and weight gain 4 kg again. Then the patient stopped taking iron supplements and vitamin, and continued to taking flupentixol and melitracen (one tablet every morning). The patient felt well after half year.

**Methods**

2. Discussion: With the increase of competition and pressure, the rate of mental sickness is getting higher and higher, which becomes the most important healthy burden around the world.

**Results**

This was an old female patient with anorexia and weight-loss when being treated in department of gastroenterology.

**Conclusions**

In summary: In the diagnosis and treatment of physical disease, the clinician should strive to have the habit of concern in patients with emotional and psychological state, asking whether the patient often feel depressed or even painful. If the answer is yes or suspicious, the clinician should ask patients about their feelings and subjective feeling, pay attention to the patient’s sleep if they have difficulty in falling asleep, have more dreams, be easy to wake up or wake up early which is often the characteristic performance of depression. The clinicians should take the initiative to ask patients if they have the negative thoughts and suicidal thoughts, which this is very important to the diagnosis and treatment of depression.

**GW23-e0114 THREE-ITEM SCREENING FOR ANXIETY AND DEPRESSION IN CARDIAC OUTPATIENTS**

doi:10.1136/heartjnl-2012-302920aa.2

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**Objectives**

To evaluate the validity of a new screening tool (the three-item inventory) for anxiety and depression in cardiac outpatients.

**Methods**

Fifty-four outpatients were collected by convenient sampling in the department of cardiology. During the waiting time, forty-six of them completed the three-item inventory with only three questions about sleepless, unexplained somatic symptoms and mood disturbance accordingly, and also HADS (hospital anxiety and depression scale) after oral consent. The specificity, sensitivity and other validity index were calculated.

**Results**

According to the result of HADS, there were 16 cases with anxiety (34.8%) and nine cases with depression (19.6%). The sensitivity of the three-item inventory for anxiety was 85.0%, specificity was 80%, with PPV 80% and area under ROC 0.87; the sensitivity and specificity of it for depression were 78% and 65% respectively.

**Conclusions**

The pilot study showed that the three-item inventory is good for anxiety screening, its validity for depression need further investigation for less depressive cases in the sample.

**GW23-e2192 ONE CASE OF ANXIETY AND DEPRESSION ASSOCIATED WITH CHRONIC URTICARIA BE CURED BY FLUPENTIXOL AND MELITRACEN TABLETS**

doi:10.1136/heartjnl-2012-302920aa.3

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**Objectives**

1. Clinical Data: The Patient, female, 46 years old, complain cardiopalmus, chest distress, insomnia, earlyawakening, irritable depression, less interest, pessimistic suspicious 4 years, was diagnosed anxious and depression, long-term was used of clonazepam, doxepine seem equal drugs, symptoms repeated about 1 year. With Hamilton Anxiety Scale (HAMA) and Hamilton Anxiety Scale 17 (HAMA-17) for patients with psychological test score of HAMA for 23 (moderate anxiety); HAMA-17 to 18 points (mild depression), consider chronic urticaria with anxiety depression may be related. Giving Flupentixol and Melitracen Tablets one tablet every morning, and block up the clonazepam, doxepine seem equal drugs, 3 days later cardiopalmus, chest distress, insomnia, irritable, depression improved obviously, itchy skin symptoms also significantly reduce; after more than 1 week the symptoms almost disappear. With Hamilton Anxiety Scale (HAMA) and Hamilton Anxiety Scale 17 (HAMA-17) for patients with psychological test score of HAMA for 13 points, HAMA-17 for 10 points, no symptoms.

**Methods**

2. Discussion: The patients is a young women, the psychiatric diagnosis of anxiety depression, long-term taking of antianxiatory drug and antidepressant drug have certain curative effect, but symptom repeatedly again and again. Because of the repeated itchy skin has a diagnosis of chronic urticaria, belongs to the body allergic disease, and
allergy treatment have certain curative effect, symptom repeatedly again and again.

**Results**  Flupentixol and Melitracen Tablets can improve the central nervous synaptic space dopamine and single amine kind of neurotransmitter content, and adjusting plant nerve dysfunction of the effect, effective improve quickly anxiety depression symptom, eliminate the body unwell symptom, especially for all kinds of mental diseases caused by the body somatic symptoms (Somatisation) effect is remarkable.

**Conclusions**  After the patients trial to take Flupentixol and Melitracen Tablets, anxiety depression symptoms get the ease and soon itchy skin symptoms disappear very quickly, with chronic urticaria of skin, depression, and anxiety belonging to the body disease and mental disease, use the same kind of drug treat at the same time control two the symptoms of the disease, this means that the human body is an organic whole, the body disease and mental disease have some of the same pathogenesis and material base.

**GW23-e1783**  **CLINICAL ANALYSIS ON DEANXIT TREATING UNSTABLE ANGINA PATIENTS WITH ANXIETY- DEPRESSION**

doi:10.1136/heartjnl-2012-302920aa.4

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**Objectives**  To observe the effect of using flupentixol melitracen (trade name Deanxit) to treat unstable angina patients with anxiety-depression.

**Methods**  126 unstable angina patients with anxiety/depression were randomly divided into control group (n=60) and deanxit intervention group (n=66). Patients in intervention group were accepted conventional therapy and deanxit 1 or 2 pieces for 4 weeks. To observe the incidence of angina pectoris and malignant cardiovascular events, and the improving of anxiety and depression in both two groups.

**Results**  The angina symptoms and CGI scores of intervention group patients were obviously superior to control group, and the incidence of malignant cardiovascular events were significantly decreased (p<0.05).

**Conclusions**  Deanxit treatment could improve the curative effect of unstable angina, decrease the incidence of short-term malignant cardiovascular events and relieve the symptoms of anxiety and depression.

**Community-based management of cardiovascular disease**

**GW23-e1067**  **THE VALUE OF CLOPIDOGREL TO ACUTE NON-ST ELEVATION MYOCARDIAL INFARCTION**

doi:10.1136/heartjnl-2012-302920ab.1

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**Objectives**  To observe and evaluate the clinical efficacy and safety of clopidogrel on acute non-ST-elevation myocardial infarction (NSTEMI).

**Methods**  30 patients with acute NSTEMI in the control group were treated with Low Molecular Heparin, Aspirin and other anti-anginal drugs. Another 30 patients with acute NSTEMI were treated with Low Molecular Heparin, Aspirin combined with Clopidogrel, which the initial dose is 500 mg and followed 75 mg/d for 2 weeks in treatment group.

**Results**  Compared with the control group, the recurrence rate of cardiac angina was significantly reduced in the treatment group (p<0.05). Clinical symptoms and the depression of ST segment in electrocardiograph were improved apparently (p<0.05), and there was little influence on the index of blood clotting (p>0.05).

**Conclusions**  The treatment of clopidogrel combined with the traditional anticoagulant drugs would be more effective and safe to NSTEMI.

**GW23-e1060**  **CLINICAL OBSERVATION OF MODIFIED QIANJIN WEIJING DECOCTION ON ACUTE EXACERBATION OF CHRONIC PULMONARY HEART DISEASE**

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**Objectives**  The objective of this study was to investigate the effect of modified Qianjin Weijing decoction on acute exacerbation of chronic pulmonary heart disease, and the changes of blood soluble thrombomodulin (sTM) over time during the therapy phase.

**Methods**  60 patients experienced acute exacerbation of chronic pulmonary heart disease were assigned randomisation to receive either routine medicine based on the guideline only in the control group or combined with modified Qianjin Weijing decoction in the treatment group. The clinical magnificent, analysis of blood gas and sTM were recorded in all patients before and 10 days after treatment respectively.

**Results**  The effective rate in treatment group (70.00%) was higher than control group (23.33%, p<0.01). The sTM, partial pressure of oxygen in artery (PaO2) and partial pressure of carbon dioxide (PaCO2) were significantly improved in both groups after treatment compared with before treatment (p<0.01).

**Conclusions**  These results demonstrate that Modified Qianjin Weijing decoction is a good alternative for patients who suffered acute exacerbation of chronic pulmonary heart disease, protect vascular endothelial system effectively associated with routine medicine.

**GW23-e1277**  **THE APPLICATION OF CRISIS MANAGEMENT IN SAFETY MANAGEMENT OF DEPARTMENT OF CARDIOVASCULAR MEDICINE**

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**Objectives**  Aiming to the crisis which we might face or being face in the nursing process of cardiovascular medicine, to eliminate disease prevention and health education.

**GW23-e0580**  **THE RELATIONSHIP BETWEEN CHRONIC OCCUPATIONAL STRESS AND ARTERIAL STIFFNESS: A CROSS-SECTIONAL STUDY IN CHINESE WORKERS**

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**Objectives**  exposure to occupational stress increases the risk of cardiovascular disease. However, few reports focused on the association between occupational stress and arterial stiffness as a
suitable marker of early stage atherosclerosis. It is unclear which aspect of chronic occupational stress shows a stronger association with arterial stiffness, as an indicator of atherosclerosis. This study was designed to clarify the connection between occupational stress components and arterial stiffness, using Brachial-ankle pulse wave velocity (BaPWV).

Methods This study was conducted on 2687 workers (male, 62.7%; mean age, 44.5) who underwent a health checkup at a physical examination centre in Shanghai, China. Occupational stress was assessed by the NIOSH job stress questionnaire (China version, modified), containing 38 questions and 5 criteria (job control, social support, job demand, skill under-utilisation and workload). Demographic data, blood pressure, fasting blood glucose (FBS), HbA1c, lipid parameters and BaPWV were measured in each subject. Each component of the job stress score is graded into four levels by percentile. The main outcome (BaPWV >14 m/s) was a useful cut-off, and considered as an independent risk factor of cardiovascular disease. Due to gender differences in the baseline study, all data were analysed by gender.

Results In univariate logistic regression analysis, compared with the highest job control group, the second lowest job control was associated with lower OR (0.706, 95% CI 0.548 to 0.910) for BaPWV >14 m/s in male workers, whilst others were insignificant. In female workers, compared to the lowest skill utilisation group, the second highest group showed a significantly lower OR (0.565, 95% CI 0.188 to 0.706). Multivariate logistic analysis demonstrated that the second lowest job control group in males still showed a significantly lower OR (0.737, 95% CI 0.552 to 0.983), following adjustment of age, BMI, education, smoking status, alcohol consumption, exercise habits and occupational type. However the corresponding association in females was insignificant.

Conclusions This study showed that the type of job stress affected arterial stiffness differently by gender. Job control might play an important role in the relationship of job stress and arterial stiffness in males, whereas skill utilisation was the most important factor in females.

GW23-e2280 THE EFFECTS OF TEAM-BASED LEARNING (TBL) TEACHING USED IN CARDIOPULMONARY RESUSCITATION SKILLS TRAINING FOR THE PUBLICS
doi:10.1136/heartjnl-2012-302920ab.6
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Objectives Most cardiac arrests occur outside the hospital, so it is really necessary to begin cardiopulmonary resuscitation skills training for the publics. The publics can participate in the rescue at once as the first witnesses of the cardiac arrest to improve the survival rate of the sufferer. The purpose of this research is to explore the teaching effectiveness of team-based learning teaching in cardiopulmonary resuscitation skills training for the publics.

Methods Between 15 September 2011 to 30 October 2011, 160 college students that are not medical profession participated in this research. They were trained for cardiopulmonary resuscitation skills based on 2010 CPR guidelines. Eighty students assigned into the experimental group, were trained with TBL teaching. Another 80 students assigned into the control group, were trained with traditional lecture teaching. Theory, skill-practice and cardiac arrest scene simulation, three tests were employed to evaluate the teaching effectiveness before the training course started and after the training course finished in two groups.

Results After training, both groups got higher scores than before training in all the tests (p<0.05). College students in experimental group acted better than those in control group in skill-practice and cardiac arrest scene simulation tests (p<0.05). Better group cooperation, superior quality and higher rates of chest compression, as well as more prompt initiation of chest compression, are obtained in the experimental group (p<0.05). However, there was no difference in theory test between them (p>0.05). The experimental group to teaching satisfaction was also higher than those in the control group (p<0.05).

Conclusions Teaching with team-based learning seems more helpful than traditional lecture teaching in training of the cardiopulmonary resuscitation skills for the publics.

GW23-e2191 EVALUATION OF COMMUNITY-BASED INTERVENTION ON HYPERTENSION PATIENTS IN URBAN COMMUNITY OF NINGXIA HUI AUTONOMOUS REGION
doi:10.1136/heartjnl-2012-302920ab.5
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Objectives To observe and evaluate the effectiveness and feasibility of hypertension health knowledge education and health-promotion interventions carried out in hypertension patients come from urban community of Ningxia hui autonomous region.

Methods Through cluster multistage and random sampling, 12 900 subjects aged >18 years old in five counties (cities) of Ningxia were investigated, and 788 urban hypertension patients were found; they were included in the current study, and given a implementation by period of 1 year of health education and health-promoting interventions for hypertension and related risk factors. Mainly through the organisation of collective teaching, face to face with the patient, issuing publicity material, radio, home follow-up and other forms of hypertension comprehensive community-based interventions, contrasted the difference between before and after of the treatment rates, pass rate of blood pressure control, blood pressure drops level, bad life behaviour change rate, to evaluate effectiveness and feasibility of the community-based intervention.

Results While after the comprehensive community-based intervention, the treatment rates, pass rate of blood pressure control improved from 48.37%, 40.90% to 58.42%, 71.47%, respectively, the average SBP and DBP (137.70±14.83 mm Hg, 84.59±10.55 mm Hg) was significantly lower than before (136.09±11.08 mm Hg, 83.25±7.11 mm Hg), (p<0.05); rate of smoking, drinking decreased from 16.03%, 9.51%, to 10.33%, 6.66%, respectively, moreover, the bad behaviour had changed significantly (p<0.05).

Conclusions Comprehensive community-based intervention can improve the cognitive level of hypertension and related knowledge for urban patients with hypertension, change bad life-style and ameliorate patients’ blood pressure level effectively, reduce the rate of hypertension, is worth spreading.
Objectives Although heart rate variability (HRV) and blood pressure (BP) differences between the transfer of supine and sitting position have long been recognised, limited data are available on the different positions when conduct the resistive exercises. This study aim to examine the HRV, BP, heart rate (HR) and subjective responses for two grade resistive exercises during sitting and supine positions in healthy adults.

Methods We recruited 20 healthy university students (10 males, 10 females; age: 22.0±2.0 years) to carry out a sitting and supine position and two intermittent elastic resistive exercise training in a quiet experimental laboratory. The positions and two grade exercises were randomised in order to eliminate the sequence effects. HRV, HR, BP, ratio of perceived exertion (RPE) and anxiety were measured after every 5 min task or 5 min rest in sitting or supine position. HRV signal was recorded using the Polar heart rate monitor (Polar Electro, Finland). The R-R interval and spectral analysis of HRV were performed in fast Fourier transforms (FFT) using a HRV software (Kubios HRV, 2.0, University of Eastern Finland, 2008). The signal of HRV was decomposed into low-frequency (0.05–0.15 Hz), high-frequency (0.15–0.5 Hz) components. All data analyses were performed by the software SPSS Windows 17.0.

Results We performed a repeated measure ANOVA to examine the variables among four condition tasks. The results indicated that the statistically significant differences for LF/HF ratio (F(1, 19)=12.184, p=0.002), HF ms² (F(1, 19)=11.290, p=0.003), LF n.u. (F(1, 19)=8.952, p=0.008), HF n.u. (F(1, 19)=11.222, p=0.003) and HR (F(1, 19)=15.818, p=0.001) between two positions. Moreover, there were significant differences between positions and graded resistive exercises for LF/HF ratio (F(1, 19)=15.386, p=0.001), HF ms² (F(1, 19)=11.383, p=0.003), LF n.u. (F(1, 19)=9.753, p=0.006), HF n.u. (F(1, 19)=16.411, p=0.001), and HR (F(1, 19)=14.112, p=0.001). However, there was no statistical difference for LF/HF ratio (F(1, 19)=0.941, p=0.344), HF ms² (F(1, 19)=3.614, p=0.073), LF n.u. (F(1, 19)=1.747, p=0.202), HF n.u. (F(1, 19)=0.448, p=0.511) and HR (F(1, 19)=2.874, p=0.106) between the two grades resistance exercises. Paired t-test was also computed to compare the differences among four resistive exercising training and every resting period. There were significant responses for two positions of HR, systolic blood pressure (SBP), diastolic blood pressure (DBP), LF/HF ratio, HFms², LF n.u. and HF n.u. (p <0.05); no significant difference was demonstrated between two grades’ resistance training (p>0.05). The average RPE scores of all conditions were between 7.05 and 10.40. Paired t-test showed that there is a significant difference between RPE at the first resting period during the sitting position (RPE-SR1) and RPE at the third resting period during the sitting position (RPE-SR3) (p=0.014). We didn’t find the significant differences between positions as well as the resistive change.

Conclusions This current study results suggested that different positions have an influence on HRV, BP, and HR. The autonomic nerve system shifted the sympathovagal balance toward sympathetic predominance when positions changed from supine to sitting. HRV are more sensitive to assess cardiovascular changes than subjective responses, and it can be used to monitor cardiac autonomic responses. However, further studies are needed, especially in the patients with different diseases.

General medicine and chronic disease management

Objectives Velvet antler of deer (VAD) is a commonly-used kidney-Yang supplementing traditional Chinese medication. According to the heart-kidney-related theory, heart Yang originates in kidney Yang and therefore heart failure due to heart Yang deficiency can be treated by tonifying kidney Yang. In this study, we investigated therapeutic effects of VAD on cardiac functions in rats with heart failure following myocardial infarction. Forty-eight male Wista rats were assigned based on 2010 CPR guideline in emergency medicine.

Methods 60 clinical training doctors in the First Affiliated Hospital of SUN Yat-sen University, who were trained in the emergency department from August 2010 to August 2011, were taken into this research. Among them, 30 doctors assigned into control group, entered emergency department before 2010 CPR guideline was published and were exposed to be trained based on 2005 CPR guideline and the other 30 doctors assigned into experimental group, were trained after 2010 CPR guideline was published and were trained based on 2010 CPR guideline. Theory and skill-practice tests were employed to evaluate the training effectiveness after the training course was finished in both groups.

Results Total scores of the experimental group are higher than those of the control group. The theory test scores have no significant difference between two groups, while the experimental group acts better in skill-practice test.

Conclusions It seems helpful to improve training effectiveness of basic life-support procedures in medical staff based on the adjustment of 2010 CPR guideline.
were subjected either to left coronary artery ligation (N=36) or to sham operation (N=12). One week after the surgery, rats with heart failure received daily treatment of double-distilled water (the HF group), captopril (the HF+CAP group) or velvet antler of deer (the HF+VAD group) by gavage for consecutively 4 weeks, while sham-operated animals (the SHAM group) were administered double-distilled water once daily for 4 weeks. Ultrasonic echocardiography was adopted to examine cardiac structural and functional parameters and serum Brain natriuretic peptide (BNP) concentration was measured using radioimmunoassay. We found that VAD partially reversed changes in cardiac functional parameters and serum BNP levels in rats with heart failure. These results provide evidence for the heart-kidney-related theory of traditional Chinese medicine and demonstrate that heart failure due to heart Yang deficiency can be treated by strengthening kidney Yang. Therefore, VAD might be a potentially alternative and complementary medicine used in the treatment of heart failure.

Methods

Results:

Conclusions

GW23-e2316  EFFECTS OF ROOT OF HERBACEOUS PEONY ON LIPID METABOLISM OF RHEUMATOID ARTHRITIS PATIENTS

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Objectives  Rheumatoid arthritis can cause multi-joints damage and ultimately leads to joint function obstacle. There is shortened life expectancy with RA patients, cardiovascular disease is considered to be the primary cause of death in patients with RA, which is an independent risk factor for cardiovascular disease. The coronary atherosclerotic heart disease risk of RA patients is higher, and which maybe related with the influence of RA on the lipid metabolism. Traditional Chinese medicine Root of herbaceous peony can decrease the blood fat, which has been used in the treatment of fatty liver, and the root of herbaceous peony glucoside (TCP) capsule is used in the treatment of rheumatoid arthritis. This report is to observe the effects of TCP on RA patients lipid levels.

Methods  Active RA patients were selected in accordance with the revised 1987 rheumatism rheumatoid arthritis classification standard, and the DAS28 score more than 3.2. Exclusion criteria for the application of any influence blood lipid drug cases. For men in patients 12 cases, female 40 cases. The patient before treatment (0 month) and after treatment (6 months after treatment) were subjected either to left coronary artery ligation (N=36) or to sham operation (N=12). One week after the surgery, rats with heart failure received daily treatment of double-distilled water (the HF group), captopril (the HF+CAP group) or velvet antler of deer (the HF+VAD group) by gavage for consecutively 4 weeks, while sham-operated animals (the SHAM group) were administered double-distilled water once daily for 4 weeks. Ultrasonic echocardiography was adopted to examine cardiac structural and functional parameters and serum Brain natriuretic peptide (BNP) concentration was measured using radioimmunoassay. We found that VAD partially reversed changes in cardiac functional parameters and serum BNP levels in rats with heart failure. These results provide evidence for the heart-kidney-related theory of traditional Chinese medicine and demonstrate that heart failure due to heart Yang deficiency can be treated by strengthening kidney Yang. Therefore, VAD might be a potentially alternative and complementary medicine used in the treatment of heart failure.

Methods

Results:

Conclusions

GW23-e1917  DOXAZOSIN THERAPY IN MILD HYPERTENSION PATIENTS CONCOMITANT WITH BPH/LUTS

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Objectives  Lower urinary tract symptoms (LUTS) resulting from benign prostatic hyperplasia (BPH) are highly prevalent in the aging male population and cause substantial adverse effects on health. There are strong evidences from multiple epidemiological studies that LUTS and hypertension are correlated. BPH/LUTS and hypertension are often coexist in the older men. Men with bothersome LUTS may predispose patients to present with various conditions including hypertension, depression and so on. Severe LUTS are likely to constitute a risk factor for the development of hypertension. α(1)-blockers initially introduced for the management of hypertension and have become first-line medical therapy options for BPH/LUTS. This study was conducted to describe the efficacy of the daily therapy, doxazosin as an α(1)-blocker, on BPH/LUTS in men with mild hypertension.

Objectives  To evaluate the safety and the therapeutic efficacy of doxazosin for mild hypertension patients with BPH/LUTS.

Methods  A total of 52 mild hypertension patients concomitant with BPH/LUTS (International Prostate Symptom Score-IPSS>7) at the first visit in our clinic were enrolled in this trial. They were assessed based on IPSS and IPSS-Quality of Life for BPH/LUTS and measurement of blood pressure (BP) in the patients with mild hypertension after excluding those with normotensive and moderate-to-severe hypertension. They were treated with 4 mg of doxazosin once daily for 12 weeks. IPSS, IPSS-Quality of Life, BPH Impact Index and BP measurement were evaluated every 4 weeks. Safety was mainly assessed via spontaneous reports of adverse events.

Results  After 12 weeks of the medication, changes in IPSS in mild hypertension men concomitant with BPH/LUTS were significantly different before and after treatment (12.6±3.8 vs 8.1±2.6, p<0.01). Doxazosin demonstrated efficacy in lowering the score for IPSS and relieving LUTS. Of them, systolic and diastolic blood pressure of 39 patients (75.0%) decreased to normal. Doxazosin was generally well tolerated. No orthostatic hypotension and other blood pressure-related adverse events occurred in all patients.

Conclusions  Doxazosin therapy appears to be efficacious in both relieving LUTS and decreasing blood pressure in mild hypertension men concomitant with BPH/LUTS.
Cardiovascular imaging (radiology, ultrasound, nuclear medicine, CT, MRI)

**GW23-e1117**  DIAGNOSTIC ACCURACY OF 128-SLICE DUAL-SOURCE CT USING HIGH-PITCH SPIRAL MODE IN ASSESSMENT OF CORONARY ARTERY STENT IMAGING COMPARISON WITH INVASIVE CORONARY ANGIOGRAPHY

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**Objectives** To investigate the diagnostic accuracy of 128-slice dual-source CT (DSCT) using high-pitch spiral mode in assessment of coronary stent imaging comparison with invasive coronary angiography (CA).

**Methods** We conducted a prospective study on patients with previous stent implantation who was scheduled for coronary angiography, received 128-slice dual-source CT using three CT protocols (high-pitch spiral (HPS), sequential (SEQ), low-pitch spiral (LPS)). Two reviewers scored coronary stent image quality, evaluated lumen blinded to the result of CA and calculated the radiation dose.

**Results** One hundreds and sixty-five patients with total 256 stents were evaluated. There were no significant differences in image quality scores between three groups. Image quality was not influenced by age, body mass index or heart rate in any groups, but heart rate variability and an impact on the image quality of SEQ and HPS group. Per-stent based sensitivity, specificity, and positive and negative predictive value in assessment of stent restenosis were 100%, 97.1%, 83.3%, 100%, respectively in the HPS CT angiography groups, 92.3%, 95.9%, 80%, 98.6%, respectively in the SEQ groups and 93.3%, 97.3%, 87.5%, 98.6%, respectively in the LPS groups. The mean effective dose in three groups were 1.0±0.5 mSv (HPS), 3.0±1.4 mSv (SEQ) and 13.0±5.4 mSv (LPS), respectively. The effective dose in HPS group is significantly less than SEQ and LPS group (p<0.01). Besides, the DSCT mean effective dose of in HPS groups was a weak less than invasive CA (1.50±0.8 mSv).

**Conclusions** As a gold standard of CA, 128-slice DSCT using HPS mode has a similar performance in assessing coronary stent patency comparison with SEQ and LPS mode, but a lower effective dose in selected patients with regular heart rates≤70 bpm.

**GW23-e1472**  ASSESSMENT OF LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENT WITH UNTREATED HYPOTHYROIDISM: A REAL-TIME THREE-DIMENSIONAL SPECKLE-TRACKING ECOCARDIOGRAPHY STUDY

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**Objectives** Recent studies suggest hypothyroidism is associated with reduced cardiac systolic and diastolic function. The present study aimed to assess the LV systolic function in patients with untreated overt hypothyroidism and subclinical hypothyroidism using a real-time three-dimensional echocardiography (RT3DE).

**Methods** Thirty patients with hypothyroidism without cardiac-related disease and 40 healthy controls underwent both standard transthoracic 2D echocardiography and RT3DE. Routine clinical and laboratory information were recorded, including the serum level of thyrotropin (TSH), free thyroxine (FT4) and free Triiodothyronine (FT3). LV volumes and ejection fraction (EF), sphericity index, LV mass index (LVMI), global longitudinal strain (GLS), global circumferential strain (GCS), global area strain (GAS), and global radial strain (GRS) were calculated by 4D Auto LVQ offline software.

**Results** The Hypothyroidism patients have lower heart rates (70.8±11.5 vs 77.6±15.4) in comparison with healthy controls (p=0.04). There were no obvious differences on age, gender, BMI, cardiac dimensions (all p>0.05), E/A ratio of Doppler-derived transmural flow velocities (1.2±0.4 vs 1.7±0.49) and Tissue Doppler-derived mitral annular E’ velocities (8.1±2.53 cm/s vs 11.67±2.54 cm/s) were significantly lower in hypothyroidism patients (both p<0.001). RT3DE assessment of the EDV, ESV, SV, CO, EF and sphericity index (SPI) did not differ significantly between the two groups (all p>0.05). The GAS (−31.63±5.58 vs −30.47±4.36) and GRS (−11.67±2.54 vs −10.59±1.67) were significantly lower in the hypothyroidism patients, and the GCS (−0.04±0.02 vs −0.02±0.01) also showed a significantly lower in the hypothyroidism patients.

**GW23-e2500**  MONITORING THE PROGRESSION OF ATHEROSCLEROSIS IN RABBITS MODEL WITH TARGETED ULTRASOUND DETECTION OF VASCULAR CELL ADHESION MOLECULE-1

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**Objectives** The aim of our study was to investigate the use of targeted contrast-enhanced high-frequency ultrasonography for molecular imaging of vascular cell adhesion molecule-1 (VCAM-1) expression on carotid artery in a rabbit atherosclerotic model.

**Methods** Microbubbles targeting to VCAM-1 were prepared via electrostatic attraction way. Atherosclerotic lesions were induced by high-cholesterolaemic diet feeding time, they were randomly assigned to three groups, namely 4-w, 8-w and 12-w group, each group containing eight rabbits. Targeted and non-targeted contrast ultrasound imaging of the left carotid arteries were performed at baseline and at 4, 8 and 12 weeks respectively. The imaging was digitally recorded and evaluated with Contrast quantitative analysis software. Left carotid specimens were harvested for HE staining and real time qPCR respectively. Pathological changes of atherosclerosis were evaluated by HE slice. Levels of VCAM-1 expression were quantified by real time qPCR and compared with the peak signal intensity (SIpeak) of the VCAM-1-targeted ultrasound contrast agent.

**Results** A significantly lower SIpeak was detected in the carotid wall of rabbits from the ‘4-w’ group as compared with rabbits from the ‘8-w’ and ‘12-w’ group (18.2±4.6 vs 36.2±3.8 vs 46.5±4.2 dB respectively; p<0.001). Such differences were not detected with the non-targeted contrast agent Sonovue. Retention of VCAM-1-targeted microbubbles in carotid wall was significantly higher than retention of non-targeted microbubbles. In addition, the SIpeak of carotid wall enhancement detected with ultrasound after injection of VCAM-1 targeted contrast agent strongly correlated with actual VCAM-1 measured in corresponding carotid segments using real time qPCR (r=0.85). In contrast, retention of the non-targeted contrast agent was not correlated with the level of VCAM-1 expression (r=0.13).

**Conclusions** VCAM-1 targeted contrast-enhanced ultrasonography can detection and quantification of VCAM-1 expression in an experimental early atherosclerotic model. It allowed an early detection of atherosclerosis and showed a significant gradual progression of atherosclerosis over time, supporting its utility as a clinical imaging tool for in vivo detection of early atherosclerosis.
−34.40±2.32), GLS (−18.93±3.89 vs −21.44±1.99), and GRS (51.13±11.95 vs 56.10±5.76) were lower in Hypothyroidism group with p=0.012, 0.002, 0.042, respectively. But GCS was not significantly different between the two groups (p=0.31). By the analysis of least squares linear regression, GLS showed the strongest associations with TSH, FT4 (B=−0.069 p=0.004 with TSH, B=−0.707, p=0.01 with TT4).

Conclusions RT3DE identifies early functional LV changes in untreated hypothyroidism. The GLS, GRS and GAS are early functional LV changes in untreated hypothyroidism. The GLS, GRS and GAS are early indicators of LV dysfunction. The GLS is associated with untreated hypothyroidism. The GLS, GRS and GAS are early indicators of LV dysfunction. The GLS is associated with untreated hypothyroidism.

Methods 124 participants with habitual snoring underwent the standard overnight polysomnography (PSG) and Ambulatory Blood Pressure Monitoring (ABPM). Blood pressure parameters included SBP, DBP, MAP, PP of daytime and nighttime and percentage of nocturnal BP decreased at same time. Neck circumference, waist circumference, hip circumference, glucose, cholesterol, and urea nitrogen, creatinine and Carotid ultrasound RF-data technology were collected using a high-definition echo-tracking device equipped with QIMT and QAS by two experienced observers who blinded to the clinical characteristics of participants. Multivariate linear regression analysis was applied to analyse the relationships between CCA parameters and cardiovascular risk factors.

Results 1. The clinical characteristics: (a) Compared with control group, dMAP and nMAP were significantly increased in mild, moderate and severe OSAS groups (p<0.05). Neckline was higher in moderate group (p<0.05) and neckline, waistline, hip circumference, prevalence of smoking, TG, dSBF, nSBF, dDBF, nDBF were higher in severe OSAS group (p<0.05). (b) Compared with mild OSAS group, Smoking, TG, dSBF, nSBF, dDBF, nDBF, dMAE, nMAE were increased in severe group (p<0.05). (c) Compared with moderate OSAS group, smoking, dSBF, nSBF, dDBF, nDBF, dMAP and nMAP were significantly increased in severe group (p<0.05).

2. The parameters of structure of CCA: IMT, D and plaques were no statistical differences between four OSAS groups (p>0.05).

3. The parameters of elasticity of CCA: (a) Compared with control group, Dis was significantly increased (p<0.05). PWV, α, β were significantly increased (p<0.05). (b) Compared with mild OSAS group, PWV, α, β were significantly increased (p<0.05). (c) Compared with moderate OSAS group, α, β were significantly increased (p<0.05).

4. By multivariate linear regression analysis, age was independently predictor of IMT, Dis, CC, PWV, α, β (β=4.516, −3.014, −3.491, −2.164, 3.550, 3.580, 3.376, p<0.05). A blunted nocturnal fall was independently predictor of D, CC, PWV (β=−2.128, −2.668, −2.385, 2.481, p<0.05), Daytime and nighttime SBP and MAP had an important effect on D (β=−2.077, −2.150, −2.128, −3.480, p<0.05). SaO2 was independently correlated with PWV (β=−2.052, p<0.05). FF was an independent predictor of PWV, α, β (β=−2.360, −2.116, −2.118, p<0.05). Smoking was an independent predictor of plaque (β=−2.047, p<0.05).

Conclusions 1. Elasticity was damaged earlier than the morphological changes of CCA.

2. PP, a blunted nocturnal fall and SaO2 were significantly correlated with elasticity of CCA. It indicated that abnormal circadian blood pressure rhythm and hypoxia were associated with elasticity of CCA in patient with OSAS.
ABSTRACTS

GW23-e1328  DIAGNOSTIC VALUE OF ECHOCARDIOGRAM IN ECTOPIA CORDIS

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Objectives  To investigate the clinical value of echocardiogram in ectopia cordis.

Methods  The retrospective analysis of echocardiographic characteristics were performed in five patients with ectopia cordis. The results derived from echocardiography were compared with CT and operation findings.

Results  Five patients were all diagnosed as ectopia cordis, which all belong to thoraco-abdominal one of which was diagnosed as pentalogy of Cantrell. Besides, echocardiography showed profound intracardiac defects in these five patients. Case 1 showed ectopia cordis (thoraco-abdominal), signal atrium, single ventricle, transposition of the great arteries and pulmonic stenosis. Case 2 displayed ectopia cordis (thoraco-abdominal), atrial situs solitus, ventricle L-loop, hypolastic left ventricle with double outlet left ventricle, mitral valve atresia, ventricular septal defect, atrial septal defect, patent ductus arteriosus and outlet subvalular pulmonary stenosis. Case 3 appeared to be ectopia cordis (thoraco-abdominal), criss-cross heart, ventricular septal defect, atrial septal defect, hypolastic right ventricle, tricuspid atresia, outlet of right ventricle pulmonary valve stenosis, and aortic overriding. Case 4 showed ectopia cordis (thoraco-abdominal) and psudoaneurysm of right ventricle, Case 5 displayed ectopia cordis (thoraco-abdominal), atrial septal defect, ventricular septal defect (subvalular aortic), double outlet left ventricle, outlet subvalular pulmonary stenosis, and non-compaction of right ventricular myocardium. The results of three cases derived from echocardiography were confirmed by CT and operation findings except that the parents of two patients gave up surgical treatment ultimately.

Conclusions  The transthoracic echocardiography can evaluate ectopia cordis and with intracardiac anomalies accurately, and it also can provide more valuable important information for clinical surgical treatment, it should be first choice in diagnosis of ectopia cordis.

GW23-e2723  ASSESSMENT OF LEFT VENTRICULAR STRUCTURE AND FUNCTION IN SLEEP APNOEA SYNDROME PATIENTS WITH ECHOCARDIOGRAPHY

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Objectives  It is well known that sleep apnoea syndrome (SAS) is associated with various medical problems that have an impact on cardiovascular mortality and morbidity. But it is seldom reported that two-dimensional speckle tracking imaging (2D-STI) and real-time 3-dimensional echocardiography (RT-3DE) were used for cardiac assessment in patients with sleep apnoea syndrome (SAS). The aim of this study is to explore the left ventricular structural and functional abnormality by echocardiography in patients with SAS, and assess the applicability of RT-3DE for cardiac measurement in SAS.

Methods  35 SAS and 31 non-SAS adults were enrolled according to apnoea-hypopnea index (AHI). Left ventricular structure and function were assessed by echocardiography techniques. Left ventricular volumes and EF were measured by both two-dimensional echocardiography (2DE) and RT-3DE, left ventricular mass (LVM) by RT-3DE, left ventricular Tei index by Tissue Doppler imaging (TDI), and longitudinal strain by 2D-STI.

Results  There was higher LVM in individuals with SAS than those without SAS (183.39±57.06 vs 153.96±52.89, p=0.012), and there were no significant differences in left ventricular volumes between two groups. The left ventricular Tei index was increased in SAS group compared with non-SAS group (0.48±0.10 vs 0.41±0.07, p=0.003). Left ventricular longitudinal strains of all segments were decreased in SAS group compared with non-SAS group, including basal anterolateral segment (BAL) (−17.50±4.87 vs −21.24±3.87, p=0.001), mid anterolateral segment (MAL) (−18.55±4.78 vs −21.97±3.85, p=0.002), apical lateral segment (ApL) (−19.60±4.81 vs −22.97±3.86, p=0.005), basal interoseptum segment (BIS) (−16.66±5.07 vs −20.62±3.10, p=0.001), mid interoseptum segment (MIS) (−17.41±4.95 vs −21.17±3.94, p=0.001), apical septum segment (ApS) (−18.19±4.88 vs −21.79±3.87, p=0.002), whereas the left ventricular EF had no significant difference between two groups. There were good correlations between 2DE and functional abnormality by echocardiography in patients with SAS, and assess the applicability of RT-3DE for cardiac measurement in SAS.

GW23-e1324  ASSESSMENT THE DIFFERENT ROTATION OF ENDOCARDIUM AND EPICARDIUM IN DHF PATIENTS USING TWO-DIMENSIONAL SPECKLE TRACKING IMAGING

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Objectives  To observe the rotation of endocardium and epicardium by two-dimensional speckle tracking imaging (2D-STI), and to evaluate its performance in diastolic heart failure (DHF) patients with a normal left ventricular ejection fraction.

Methods  Eighty-four consecutive clinically stable patients were enrolled in this study (32 healthy controls, 32 with diastolic heart failure, 20 with systolic heart failure). High frame rate dynamic two-dimensional images were recorded at the left ventricular short-axis views, including basal, papillary muscle and apical planes. Endocardial and epicardial global rotation were measured using Q-lab7.0 software offline.

Results  1. In all the subjects, the rotation of the endocardium was obviously greater than that of epicardium;
2. As seen from the apex, LV endocardium and epicardium performed a wringing motion with a clockwise rotation at the base and counterclockwise rotation at the apex.
3. In the apical plane, endocardial rotation was significantly lower in both heart failure groups than in controls, and was depressed to a larger extent in SHF patients than in those with DHF (control: 6.69±2.97, DHF: 5.63±2.20, SHF: 3.01±1.34, p<0.001). Epicardial rotation was no significant difference between the DHF group and the control group, though it was significantly lower in patients with SHF.
4. At the base level, the rotation of endocardium and epicardium was no difference between DHF and control groups, but it was significantly reduced in patients with systolic heart failure.

Conclusions  The LV endocardial rotation is reduced, but epicardial rotation is normal in DHF patients. However, both endocardial and epicardial rotation are reduced in patients with systolic heart failure. There exists the LV contraction properties damage in DHF patients.
and RT-3DE for measurement of left ventricular end diastolic volume (93.35±20.43 ml, 95.74±25.42 ml, respectively (r=0.866, p<0.001)), end systolic volume ((57.81±11.29 ml, 59.95±15.09 ml, respectively (r=0.783, p<0.001)), and EF (59.93±5.09 %, (58.76±5.82%), respectively (r=0.595, p<0.001)). And the two measurements consist well.

Conclusions SAS is associated with left ventricular structural and functional changes. Combined use of TDI, 2D-STI, and RT-3DE can detect early abnormality of left ventricular structure and function in patients with SAS. RT-3DE is feasible to evaluate LV structure and function in SAS due to its good correlation and consistence with 2DE, which may have important significance in patients with SAS.

GW23-e0447 VASCULAR ENDOTHELIAL FUNCTION MEASUREMENT AND INSULIN RESISTANCE INDEX CONTRIBUTE TO THE PREDICTION OF ERECTILE DYSFUNCTION IN YOUNG MAN

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Objectives Investigate the relationship between glycometabolic disorders and erectile dysfunction (ED) without organic aetiology in young man under the age of 40 years.

Methods 192 patients and 33 normal controls were enrolled. ED was evaluated by using the International Index of Erectile Function-5 (IIEF-5) questionnaire. We measured traditional cardiovascular risk factors, hormone levels and vascular parameters. The HOMA index was calculated as the product of the fasting plasma insulin level (μU/ml) and the fasting plasma glucose level (mmol/l), divided by 22.5. Insulin Resistance (IR) was measured by homeostasis model assessment (HOMA).

Results Patients with ED had significantly higher systolic blood pressure (SBP), High-sensitivity C-reactive protein (hsCRP), high Insulin resistance index (HOMA-IR) and carotid intima-media thickness (IMT), compared with controls. Brachial artery endothelium-dependent flow-mediated vasodilation (FMD) was significantly reduced in ED patients. By multivariate logistic regression analysis, FMD, SBP, hsCRP and HOMA-IR were significantly associated with ED. In receiver-operating characteristic (ROC) analysis, FMD was a significant predictor of ED (area under the curve (AUC) 0.928, p <0.001). The cut-off value of FMD <9.6% had sensitivity of 80.9% and specificity of 100%. HOMA-IR was also a predictor of ED (AUC of HOMA-IR 0.762, p <0.001).

Conclusions ED may be the first clinical sign of endothelial dysfunction and a clinical marker of cardiovascular and metabolic diseases. Endothelial dysfunction, underlying insulin resistance in young ED patients without well-known related risk factors may be the underlying pathogenesis of ED in young patients as in elderly one. Measurement of FMD, HOMA-IR can improve our ability to predict ED in young man.

GW23-e2003 LEFT VENTRICULAR DYSSYNCHRONY CAN BE SEEN IN ASYMPTOMATIC HEART TRANSPLANTATION PATIENTS WITH NORMAL LVEF: A TRI-PLANE SPECKLE TRACKING STUDY

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Objectives The current study aims to explore whether asymptomatic heart transplantation patients with normal LVEF have left ventricular systolic dysfunction or dysynchrony by using Tri-plane Speckle Tracking Imaging (T-STI).

Methods Fifteen asymptomatic heart transplantation patients receiving routine follow-up echocardiography with LVEF>60% were randomly enrolled as heart transplantation group (HT Group). Twenty healthy subjects with normal physical exam, ECG, UCG, blood routine and biochemical examination were randomly enrolled as control group (Con Group).

Apical tri-plane loop was acquired (4V-D) transducer, GE E9) and analysed offline using EchoPAC analysis station. Average longitudinal peak strain of apical four chamber view (GLPS-A4C), apical long axis view (GLPS-LAX), apical two chamber view (GLPS-A2C) and left ventricle (GLPS) were measured. Time to peak strain of 18 segments was analysed and its SD (18-SD) was calculated.

All the heart transplantation patients received routine blood exams within 12 h of their follow-up echocardiography. White blood cell count, Neutrophils count, lymphocytes count, neutrophils percentage and lymphocytes percentage were recorded.

Results 1. GLPS-A4C, GLPS-LAX, GLPS-A2C and GLPS decreased significantly in HT Group than those in Con Group, while 18-SD increased significantly in HT Group than in Con Group (HT Group vs Con Group: GLPS-A4C, 16.13±3.64% vs 21.31±4.15%; GLPS-LAX, 15.31±4.30% vs 20.61±4.40%; GLPS-A2C, 16.46±3.98% vs 21.45±4.58%; GLPS: 15.96±5.35% vs 21.12±3.75%;18-SD, 27.63±10.80 vs 15.74±5.73; all p<0.01).

2. In HT Group, value of 18-SD showed positive correlation with white blood cell count (r=0.54, p<0.04)

Conclusions 1. Tri-plane imaging can display apical four chamber view, long axis view and apical two view at the same time. It is helpful to evaluate ventricular synchrony and is promising in follow-up heart function assessment of heart transplantation patients.

2. Asymptomatic heart transplantation patients with normal LVEF may also have sub-clinical systolic dysfunction and ventricular dysynchrony, which may be caused by post-transplant chronic rejections.

GW23-e2707 COMPARISON OF ORAL IVABRADINE AND METOPROLOL FOR CONTROL OF HEART RATE IN PATIENTS UNDERGOING CT CORONARY ANGIOGRAPHY

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Objectives Optimisation of heart rate (HR) to limit motion artefacts is mandatory in all patients undergoing CT coronary angiography (CTCA). Despite use of β-blockers(βB), patients often have HR>target range of 65 bpm. Though calcium channel blockers have also been used as alternatives to β-blockers, administration of both of these classes of rate lowering drugs may be hazardous in some patients (eg, those with baseline Bp<100–110 mm Hg, severe
left ventricular dysfunction, peripheral vascular disease, severe obstructive airway disease). Ivabradine is a selective blocker of I\textsubscript{f} current and sinus node pacemaker activity and unlike β-blockers has neutral effects on systolic and diastolic blood pressure (SBF, DBP) and cardiac contractility.

**Methods** Amongst 200 patients undergoing CTC, oral Ivabradine (5 mg BD) started 48 h, was compared to oral Metoprolol (50 mg BD). Patients with atrial fibrillation, known arrhythmias, impaired renal function (Serum creatinine>1.5 mg/dl), known allergy to iodinated contrast media, pregnancy, baseline heart rate <60 bpm, left ventricular ejection fraction <30%, blood pressure <100/70 mm Hg, and other known contra-indications to β-blockers were excluded.

Additional doses (5 mg or 50 mg respectively) of the drugs were given on arrival in the CT room, if the HR was>65 bpm. If at 3 h after the additional first dose, the heart rate was still>65 bpm, another dose of 5 mg Ivabradine or 50 mg Metoprolol was administered. Baseline HR, systolic and diastolic BP (HR1, SBP1, DBP1) and final parameters prior to CTC (HR2, SBP2, DBP2) were recorded. Patients whose heart rate could not be lowered below 65 bpm despite this protocol had their CTC procedures rescheduled. (We did not allocate patients to receive IV β-blockers, to avoid skewed comparisons between the groups, since IV Ivabradine was not available with us).

**Results** Of those receiving Ivabradine 52% had HR<65 bpm on arrival in the CT room as compared to only 15% in the β-block group. The final HR in Ivabradine group was significantly lower, as compared to Metoprolol (57.6±3.1 vs 62.1±2.9, p<0.001). Mean % reduction in HR was significantly greater with Ivabradine (52.1% vs 28.1%, p<0.001). Ivabradine had no significant effect on Systolic or diastolic BP (SBP1, SBP2 134.1±10.2, 134.3±9.1 mm Hg; DBP1, DBP2: 85.1±7, 84.2±6.7 mm Hg, p=ns). Metoprolol demonstrated significant reduction in both SBP and DBP (SBP1, SBP2: 134.3±12.2, 117.1±7.1; DBP1, DBP2: 87.1±6.4, 83.1±3.9, p<0.001 for both).

The need for additional doses of the drug was significantly higher in the β-block group (87% vs 48%, p<0.01). In the Ivabradine group, 34/100 (34%) required one additional dose and 14/100 patients (14%) required two additional doses to achieve the target HR of ≤65 bpm. In the β-block group, 40/100 patients (40%) required one additional dose while 47/100 patients (47%) required two additional doses of Metoprolol to achieve the target heart rate.

Both drugs were well tolerated and no adverse effects to any of them were reported.

**Conclusions** Ivabradine was found to be safe and effective as a HR reducing agent in patients undergoing CTC. It produced greater degree of reduction in HR as compared to Metoprolol, without any significant change in the systolic or diastolic blood pressure. The number of patients requiring additional doses of the drugs prior to achieving target HR was also significantly reduced with Ivabradine. Given its pharmacological properties, the use of Ivabradine as a HR lowering agent promises to be an attractive therapeutic option in patients undergoing CTC.

**Objectives** To evaluate the alterations of peripheral arterial structures and stiffness in patients suffering from symptomatic lower extremity arterial disease (PAD), as well as the factors correlated with femoral arterial stiffness.

**Methods** Thirty-one patients with lower extremity PAD and 34 age- and sex-matched control subjects were enrolled in this study. The intima-media thickness (IMT), diameter and two parameters of arterial stiffness (β, pulse wave velocity (PWVβ)) were measured by displaying the longitudinal view of the common carotid arteries and common femoral arteries by using the technology of QIMT and QAS. The left ventricular ejection fraction was measured in order to exclude subjects with systolic dysfunction. These parameters were compared between these two groups. Univariable and multivariable analysis were carried out to evaluate the factors correlated with femoral arterial stiffness.

**Results**

1. The SBP, PP, smoking packyear and smoking extent (non-smoker, smoker with <40 packyear, or smoker with ≥40 packyear) were significantly higher in the PAD group than those in the control group.

2. The IMT (μm) of the left common carotid artery (LCCA) was significantly increased in the PAD group ((727.29±160.61): (649.12±123.32), p<0.05), while the IMT of the right common carotid artery (RCCA) was insignificantly increased ((692.26±168.59):(626.09±98.57), p=0.06). The diameters (DIA, mm) of LCCA and RCCA were significantly enlarged in the PAD group ((8.31±0.87):(8.21±0.75), (9.00±0.94):(8.12±0.67), p<0.01). IMT/D of both sides were insignificantly decreased. As to the left and right common femoral artery (LCFA, RCFA), the IMT and IMT/D were significantly increased (LCFA IMT (965.35±531.60): (690.76±193.51), RCFA IMT (911.43±419.61): (653.88±202.92), LCFA IMT/D (104.45±42.75):(75.59±19.08), RCFA IMT/D (106.86±63.21):(68.57±20.35), p<0.01), while the DIA was insignificantly decreased. And the mean IMT (mIMT) of LCCA and RCCA, and that of LCFA and RCFA were significantly increased in the PAD group.

3. The stiffness indices β, PWVβ of LCWA and PWVβ of RCCA were significantly higher ((LCCA β (14.60±5.91):(10.35±2.48), LCCA_PWVβ (9.43±3.08):(7.93±1.16), RCCA_PWVβ (8.82±1.92):(7.75±1.42), p<0.05), and β of RCCA was insignificantly higher ((12.14±4.56):(10.46±3.84), p<0.05) in the PAD group than those in the control group. β and PWVβ of LCFA and RCFA were significantly higher in the PAD group (LCFA β (27.59±20.55):(16.35±10.83), LCFA_PWVβ (13.50±6.19):(9.46±3.40), RCFA β (27.95±28.90):(12.22±6.53), RCFA_PWVβ (12.54±6.05):(8.49±2.52), p<0.05). The mean carotid and femoral β (mβ) and PWVβ (mPWVβ) were significantly increased in the PAD group.

4. Univariable analysis showed that the femoral mβ was correlated with femoral mIMT, SBP, PP, smoking amount and smoking extent (r=0.50, 0.46, 0.47, 0.29, 0.33, p<0.05–0.01). And the femoral mPWVβ was also correlated with mIMT, age, SBP, PP, smoking packyear and smoking extent (r=0.51, 0.25, 0.59, 0.57, 0.31, 0.30, p<0.05–0.01). In Multivariable analysis, mIMT and PP were factors independently correlated with femoral mPWVβ.

**Conclusions** Patients with symptomatic lower extremity PAD have carotid and femoral remodelling as well as higher arterial stiffness. The alterations are more prominent in femoral arteries. The stiffened femoral arteries are due to atherosclerosis of the artery, higher blood pressure and smoking status.

GW23-e1445** PERIPHERAL ARTERIAL REMODELLING AND STIFFNESS IN PATIENTS WITH SYMPTOMATIC LOWER EXTREMITY PERIPHERAL ARTERIAL DISEASE**

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**ASSESSMENT OF LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENTS WITH MULTI-VESSEL CORONARY ARTERY DISEASE AND NORMAL WALL MOTION BY TWO-DIMENSIONAL SPECKLE TRACKING IMAGING**

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**Objectives** We sought to evaluate myocardial systolic function in patients with multi-vessel coronary artery disease and normal wall motion by two-dimensional speckle tracking imaging.

**Methods** Forty-five patients with multi-vessel coronary artery disease and normal wall motion (MVD) were enrolled into this study and 36 subjects have low risk of coronary artery disease as control group. MVD group were divided into CCC-MVD group and N-MVD group according to the presence or absence of coronary collateral; LCA-MVD group and RCA-MVD group according to the position of coronary atherosclerosis mainly involved. The two-dimensional loop-cines were obtained in apical 2-chamber view, apical 4-chamber view and apical the long axis view of left ventricle, and three levels of short axis views (mitral valve, papillary muscle and cardiac apex). Left ventricular wall was divided into 18 segments by Q-analysis software, longitudinal, radial and circumferential systolic strain and global longitudinal strain (GLS) were analysed, calculated the average of radial and circumferential systolic strain of 18 segments as global radial and circumferential strain (GRS and GCS), and the average of longitudinal, radial and circumferential systolic strain of basic, middle and apex levels (Bas-GLS, Mid-GLS, Ap-GLS, Bas-GCS, Mid-GCS, Ap-GCS, Bas-GRS, Mid-GRS, Ap-GRS).

**Results** The conventional echocardiography parameters of left ventricular systolic and diastolic function were similar to the multi-vessel CAD with normal wall motion and control group. GRS, GCS, Bas-GLS, Bas-GCS, Bas-GRS, Mid-GLS, Mid-GCS were lower in MVD than in control group. Compared to control group, GLS, Bas-GLS, Bas-GCS, Mid-GLS were decreased both in N-MVD group and CCC-MVD group, while Mid-GCS was just decreased in N-MVD group; compared with control group, LCA-MVD group had lower GLS, Bas-GLS, Mid-GLS, Bas-GCS, Mid-GCS and RCA-MVD group had lower Bas-GLS, Bas-GCS, Bas-GRS. Meanwhile, RCA-MVD group had higher Mid- and Ap- strain than LCA-MVD, especially Ap-GCS, which was significantly higher than control group. The best cut-off value was determined as 0.227% for Mid-GCS, giving a maximum sum of sensitivity (62.9%) and specificity (85.7%), a minimal sum (51.4%) of the misdiagnosis and Missed diagnosis rate.

**Conclusions** Myocardium systolic function were impaired in MVD patient, especially basal systolic function and Longitudinal systolic function, though they had normal wall motion at rest; systolic function were lower in atherosclerosis lesion mainly involved LCA than mainly involved RCA; apical systolic function and Mid-GCS were improved in CCC-MVD group than in N-MVD group.

**THE CHANGES OF CORONARY ARTERY FLOW FLOW ARE HELPFUL TO EVALUATE THE DEGREE OF MYOCARDIAL ISCHAEMIA IN ACUTE MYOCARDIAL INFARCTION**

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**Objectives** To study the change of coronary artery haemodynamics after acute myocardial infarction in mice, and evaluate the value in judging acute myocardial infarction and the infarction area.

**Methods** Wild-type (C57BL/6) mice were separated into three groups: sham operation (sham), low ligation group (MI-L), high ligation group (MI-H). Myocardial infarction (MI) was induced by left anterior descending branch ligation, and some haemodynamics parameters of left coronary artery were measured by high resolution ultrasound, including velocity (V1, V2, Vmean), velocity-time integral (VTI) of flow at 2 h (V1-2h, V2-2h, Vmean-2h, VTI-2h), 6 h (V1-6h, V2-6h, Vmean-6h, VTI-6h) after MI. Mice were killed at 12h after MI, Troponin I (TNI) and MI area (MIA) were
GW23-e1730

ASSESSMENT OF CORONARY ARTERY IN-STENT PATENCY BY FLASH-DSCT VERSUS CORONARY ARTERY ANGIOGRAPHY

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Objectives: Coronary computed tomographic modality sheds more light on radiation reduction while maintaining image quality. The aim of this study was to evaluate the performance of second generation dual source coronary CT scanner with prospective electrocardiographically triggered high-pitched spiral acquisition (FLASH-DSCT) in the detection of in-stent restenosis (>50% luminal narrowing) in symptomatic patients referred for conventional coronary angiography (CCA).

Methods: 62 patients/107 stents with chest discomfort were prospectively evaluated after coronary stenting. Before CCA, FLASH-CT was performed by using a second generation, dual-source CT scanner (Definition Flash; Siemens Healthcare, Forchheim, Germany) between September 2011 and March 2012.

Results: Average heart rate (HR) was 58±7 bpm, and Average effective dose (ED) was 1.61±0.62 mSv. The interval between stenting and CCA was without difference between 2 h and 6 h in the same group. V1-2h, Vmean-2h and VT1-2h were negatively related to infarction area.

Conclusions: The haemodynamics parameters of left coronary artery can be measured by high resolution ultrasound, and it is a feasible and reproducible method to evaluate the degree of myocardial ischaemia in acute myocardial infarction.

GW23-e0828

EVALUATE TO DIFFERENCE OF SUBENDOCARDIAL AND SUBEPICARDIAL LAYERS CIRCUMFERENTIAL STRAIN USING 2D SPECKLE-TRACKING IMAGING IN NORMAL SUBJECTS COMBINED WITH EXERCISE STRESS TESTING

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Objectives: To observe the variability of which variation of normal subjects short-axis of the left ventricular subendocardial and subepicardial layers myocardial circumferential strain during isovolumic end-diastolic in the exercise stress, and to analyse the differences of the different myocardial layers strain.

Methods: Echocardiography was performed in 43 healthy students at rest, maximal aerobic power and recovery after exercise. Store the dynamic images of the left ventricular basal, papillary muscle
and apical short-axis view. Subendocardial and subepicardial layers myocardial circumferential strain (ENCS, EPCS) of three short-axis during isovolumic end-diastolic were analysed using X-ray software, to acquire the mean circumferential strain of Subendocardial (B-ENDCS, M-ENDCS, A-ENDCS) and subepicardial (B-EPCS, M-EPCS, A-EPCS) myocardial layers for each short axis of six segments at basal, papillary muscle and apical levels. Analyse the differences of the different layers myocardial strain.

Results
1. The ENCS of the left ventricular basal, papillary muscle and apex levels are greater than EPCS during exercise (At rest: −20.41±4.60 vs −8.27±4.58%, −20.47±15.07 vs −8.40±3.99%, −24.34±10.35 vs −8.29±3.65%, At maximal aerobic power: −12.45±9.55 vs −5.02±3.89%, −14.06±9.18 vs −4.76±3.89%, −23.51±15.10 vs −7.92±5.52%, At recovery after exercise: −16.28±9.38 vs −7.05±3.41%, −22.45±6.70 vs −7.75±3.18%, −27.26±9.83 vs −8.66±7.02%, p<0.01).

2. ENCS and EPCS of the basal, papillary level short-axis during isovolumic end-diastolic are decreased at first and then increased during exercise (p<0.05).

Conclusions
1. In normal subjects, subepicardial and subepicardial layers myocardial circumferential strain are consistent with the physiological changes myocardial during exercise.
2. During exercise, subepicardial and subepicardial layers myocardial circumferential strain are different, and we can identify myocardial ischaemia of different levels by 2DSE.

GW23-e0884
QUALITATIVE EVALUATION OF CAROTID FUNCTION AND STRUCTURE IN HYPERThYROIDISM PATIENTS BY ULTRASOUND RADIO FREQUENCY DATA
TECHNOLOGY

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Objectives
The research and application of RF-data technology non-invasive observation of hyperthyroidism in patients with carotid artery structure parameter (IMT) and functional parameters (β, PWV) changes from two aspects, the structure and function of carotid artery damage evaluation and discuss the influential factors, in order to facilitate early detection and intervention in patients with hyperthyroidism clinical vascular lesions.

Methods
71 patients with primary hyperthyroidism which is not yet in treatment were involved into study as hyperthyroidism group. 71 healthy volunteers were supplied as normal control group cases which matched in age and gender. Application of RF-data for measuring and comparing the two groups of the common carotid artery structural parameters of intima-media thickness (IMT) and functional parameters compliance coefficient (CC), stiffness index (β), pulse wave velocity (PWV), evaluation of hyperthyroidism vascular damage and the correlation between the parameters and age, body mass index, haemodynamic parameters (blood pressure, heart rate), thyroid hormone levels and other risk factors.

Results
1. The age, gender differences between the two groups had no statistical significance (p>0.05); hyperthyroidism group, body mass index, diastolic blood pressure were lower than control group (p<0.01), systolic blood pressure, pulse pressure, heart rate were higher than control group (p<0.01); hyperthyroidism group FT3, FT4 were higher than control group (p<0.01), TSH were lower than control group (p<0.05).
2. In the hyperthyroid group carotid artery structural parameter IMT were higher than control group (483.18±96.61 vs 442.35±81.41/m, p<0.01); function parameter PWV were higher than control group (7.46±3.26 vs 5.80±2.08, 6.38±1.4 vs 15.55±1.03 m/s, p<0.01), CC were lower than control group (0.95±0.36 vs 1.22±0.39, p<0.01).
3. Every structure and function parameters were correlated with age significantly, after adjustment for age, CC were associated with diastolic blood pressure and heart rate (r=0.392, r=−0.294, p<0.05), β were associated with diastolic blood pressure (r=−0.440, p<0.01), PWV were associated with pulse pressure and heart rate (r=0.503, r=0.285, p<0.01); parameters were not associated with body mass index and thyroid hormone level (p>0.05).

Conclusions
1. The structure and function of carotid artery in patients with hyperthyroidism damage.
2. The hyperthyroid patients carotid artery in the early damage closely related with haemodynamic changes.
3. The RF ultrasound technology can be used to evaluate the structure and function of carotid artery in hyperthyroid patients.

GW23-e0884
EVALUATION OF LEFT VENTRICAL FUNCTION BY TWO-DIMENSIONAL LONGITUDINAL STRAIN IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMA

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Objectives
To evaluate the left ventricular function of global and each section through left ventricular longitudinal strain in familial hypercholesterolaemia (FH) patients with two dimensional strain imaging (2DSI).

Methods
Thirty-nine patients with FH and 33 volunteers underwent 2DSI. The long axis myocardial peak systolic strain (S), peak systolic strain rate (SRs), peak early diastolic strain rate (SRe) and peak late diastolic strain rate (SRA) of 18 segments in different left ventricular walls and overall S, SRs, SRe and SRA were measured.

Results
1. The subjects enrolled in 72 cases which analysis 1296 segments, and tracking successful rate was 97.38%. The SRe of two chamber of cardiac (1.94±0.59 vs 2.28±0.55), three chamber of cardiac (1.38±0.52 vs 2.30±0.57), four chamber of cardiac (2.00±0.58 vs 2.37±0.43) and the overall (1.895±0.50 vs 2.32±0.48) in FH group was less than the control group (p<0.01). The SRA of three chamber of cardiac (1.06±0.43 vs 1.10±0.52), two chamber of cardiac (0.92±0.50 vs 1.15±0.69), four chamber of cardiac (1.07±0.41 vs 1.23±0.61) and the overall (1.02±0.35 vs 1.16±0.55) in FH group was less than the control group, but the difference was no statistically significant (p>0.05). The SRe of posterior basal segment to apical segment, anterior basal segment, posterior septal basal segment to apex segment, lateral basal segment, inferior basal segment to middle segment and anterior basal segment in FH group was less than the control group (p<0.05). The SRA of anterior basal segment, inferior basal segment and lateral basal segment in FH group was less than the control group (p<0.05).
2. The three chamber of cardiac, two chamber of cardiac, four chamber of cardiac peak systolic strain and peak systolic strain
rate in FH group was lower than the control, but the difference was no statistically significant (p>0.05); overall SRs in the FH group was decreased (~1.32±0.29 vs ~1.52±0.24) (p=0.01).

The S of posterior basal segment and anterior basal segment in FH group decreased (p<0.05). The SRs of posterior basal segment, posterior septal basal segment, lateral basal segment and to the middle segment, inferior basal segment and anterior basal segment to the middle segment in FH was lower than the control group (p<0.05).

Conclusions
1. Using STI can detect left ventricular overall and segmental systolic function impairment in FH patients through longitudinal s train in the early stage, in which SRe is more sensitive than SRa.
2. Using STI can detect left ventricular overall and segmental systolic function impairment in FH patients through longitudinal strain in the early stage, in which SRs is more sensitive than S.

GW23-e0937
TIME TO PEAK THREE-DIMENSIONAL STRAIN SIGNIFICANTLY DELAYED IN ASYMPTOMATIC PATIENTS WITH SEVERE MITRAL REGURGITATION ALTHOUGH LV EF >60%
doi:10.1136/heartjnl-2012-302920ad.21

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Objectives
The current study is to see whether 3D speckle tracking imaging technology is useful when evaluating heart functions in patients with mitral regurgitation.

Methods
Forty-five consecutive asymptomatic patients with severe mitral regurgitation due to flail leaflets and 30 gender- and age-matched healthy participants were enrolled in the study.

Routine echocardiography, Colour Doppler and 3D echocardiography were performed on all subjects (Philips IE33, s5-1, X3-1). Biplane Simpson’s method was used to obtain left ventricular ejection fraction (LVEF). Vena contracta (VC) and proximal isovelocity surface area (PISA) methods were both used to grade the mitral regurgitation. 3D data were analysed off-line by TOM-TEC 4D LV surface area (PISA) methods were both used to grade the mitral regurgitation. 3D data were analysed off-line by TOM-TEC 4D LV imaging technology and 2D speckle tracking technology respectively in real-time or off line

Results
Direct two-dimensional measurement
The systolic longitudinal strain and longitudinal strain rate in different segments of the left ventricular in normal subject: inferior wall>posterior septal>anterior septal>posterior wall>anterior wall>lateral wall (P<0.05); The correlation coefficient between the systolic longitudinal strain, longitudinal strain rate and the LVEF is ~0.532 and ~0.550 separately. The systolic circumference strain and the circumference strain rate of the endocardial layer is much more than that in the epicardial layer obviously by the short axis view of the left ventricle (p<0.01). The systolic circumference strain and the circumference strain rate of the mitral valve level is much more than that of the papillary muscle level and apical level (p<0.05).

The overall characteristic of the peak systolic radial strain and radial strain rate of the short axis in normal subject is that the free wall is greater than the septal, and there is statistics significance between the septal with inferior wall and posterior wall (p<0.05); The correlation coefficient between the systolic radial strain, radial strain rate and the LVEF is 0.533 and 0.495 separately. The overall characteristic of the peak diastolic radial strain and radial strain rate of the short axis in normal subject is the same that the free wall is greater than the septal, and there is statistics significance between the septal with posterior wall (p<0.05).

Tissue velocity imaging technology
Comparing with other segments in different wall: the systolic longitudinal strain of the apical segment is much less than the basal segment and the middle segment (p<0.05); The early diastolic longitudinal strain of the middle segment>the basal segment>the apical segment. The late diastolic longitudinal strain of the apical segment is less than that of the basal segment and the middle segment (p<0.05). The peak velocity of the cardiac cycle is significant decreasing from the basal segment to the apical segment. The correlation coefficient between the systolic longitudinal strain, longitudinal strain rate and the LVEF is ~0.562 and ~0.550 separately. The correlation coefficient between the diastolic longitudinal strain, longitudinal strain rate and the LV diastolic
Two-dimensional speckle tracking technology

The systolic longitudinal strain of the entire segments in the long axis view of the left ventricle is increasing from the basal segment to the apical segment; there is no statistics significance in the peak systolic radial strain between different segments with the same level, but the peak systolic radial strain of the papillary muscle level is more than the mitral annulus level (p<0.05). The systolic circumference strain of the septal is more than that of the free wall, and there is statistics significance in some segments (p<0.05). The torsion of the left ventricular shows as clockwise at the base of the heart and as counterclockwise at the apex. The torsion of the global cardiac shows as counterclockwise in the cardiac cycle. The absolute value of the correlation coefficients between the systolic strain, strain rate, the left ventricular systolic torsion, the mitral annulus displacement and the LV systolic functional parameters are all more than 0.55.

Conclusions

1. Direct two-dimensional measurement not only can measure the circumference of the endocardial and epicardial layer of systolic and diastolic along short axis, but also can measure the length of the long axis, thus indirectly get the circumference strain and circumference strain rate, longitudinal strain and longitudinal strain rate; this method can be used in the General instrument.
2. Anatomical M-mode echocardiography can freely move M-mode sample line within 360°to the interest area without the limit of angle; this method is suitable for the patient with uncooperative position.
3. Tissue Doppler echocardiography can be used to quantitatively measure the myocardial velocity, acceleration, strain of the local wall directly; it is suitable for evaluating the movement feature of wall by the long axis.
4. The two-dimensional speckle tracking imaging technology can measure the myocardial strain and strain rate of local wall more accurately, and evaluate regional myocardial systolic and diastolic function; the correlation of the parameters and the LVEF measured by the traditional ultrasound method is good, but it require higher equipment

Results

1. Group DMA was compared with control group and was significantly different in RPP, Ea, SVRI and SW (p<0.01). There were significant differences in SLBA, SLPM and SLAP among DMN, DMA and control groups (p<0.01).
2. SLBA, SLPM and SLAP were correlated positively with Ea and SVRI (p<0.01). The longitudinal strain had reverse correlation with SW and RPP (p<0.01), while positively with EF and fractional shortening (FS) (p<0.01).
3. DMN compared with control group, the ROC analysis showed that the under-ROC curve area of SLBA, SLPM and SLAP were 0.857, 0.862 and 0.832 respectively, but there was no significant difference among them (p>0.05). On the other hand, the ROC analysis between DMA and DMN group indicated that the under-ROC curve area of SLPM and SLAP were 0.720, 0.782 and 0.942, moreover SLAP>SLPM>SLBA.

Conclusions

To patients with DM, ventricular-arterial coupling and SL decreased in synchronism. Ventricular-arterial uncoupling, SL would be asynchronous, power decrease, and increase oxygen.
GW23-e2649

Dissection Between Venticular Septum and Aortic Root Associated with Rupture of Left Valsalva’s Sinus in Behcet’s Disease Detected by Transesophageal Real-Time Three-Dimensional Echocardiography

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Objectives Behcet Disease (BD) is a multi-system inflammatory disorder as its underlying pathological process. Cardiovascular involvements have been reported in 7–46% of cases with Behcet’s disease. We reported a case of Behcet’s disease with severe aortic root vascularitis. Traditional two-dimensional echocardiography (2DE) demonstrated a dissection between anterior wall of the aortic root and interventricular septum associated with a rupture of left Valsalva sinus aneurysm into the left ventricular outflow tract. However, preoperative transesophageal real-time three-dimensional echocardiography (3DE) revealed that the aneurysm-like structure in left ventricular outflow tract involved the most part of the left ventricular outflow tract wall. The diagnosis was corrected by 3DE as the dissection between the ventricular septum and aortic root associated with a perforation of left Valsalva sinus and a prolapse of the exfoliated endocardium into the left ventricular outflow tract. These findings were confirmed during open heart surgery. Conclusion: 3DE is helpful to differentiate the dissection in the aortic root from the rupture of Valsalva aneurysm, especially in demonstrating the extent of aneurysm-like structure in the left ventricular outflow tract.

Methods

Results

Conclusions

GW23-e272

CLINICAL STUDY OF THE MECHANISM OF MITRAL REGURGITATION IN THE PAPILLARY MUSCLE DYSFUNCTION

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Objectives 目的: This investigation and report was a clinical study of the mechanism of mitral regurgitation in the papillary muscle dysfunction caused by coronary artery disease. We have studied correlation of the different geometric angles between the mitral valve leaflets and the mitral valve annular and mitral regurgitation severity by using transesophageal echocardiography (TEE).

Methods 104 cases patients, among 44 cases patients with mitral regurgitation and the papillary muscle dysfunction caused by posterior or inferior myocardial ischaemia or infarction by coronary artery disease, intraoperative TEE were recorded in 10 patients after complex mitral valve repair including placement of an annular ring with or without concurrent repair of mitral leaflet tissue itself, and 20 patients control subjects were studied. TEE showed below three view: left ventricular four-chamber view, two-chamber view and apical long-axis view during early systole and lately systole; the geometric angles between the mitral valve leaflets and mitral valve annular in three views were measured by SIEMENS KinetDx DS3000 software system. The geometric angles between the mitral valve anterior leaflet with the mitral valve annular was determined as Aa°, the geometric angles between the mitral valve posterior leaflet with the mitral valve annular was
determined as PA°, the geometric distance from closed point the anterior and posterior leaflets tip of the mitral valve to the mitral valve annular was determined as d(cm), early systole was determined as S1, lately systole was determined as S2, and the geometric maximum area from closed point the anterior with posterior leaflets tip of the mitral valve to the mitral valve annular was determined as Area-max (cm²).

**Results**
The geometric angles between the mitral valve leaflets and mitral valve annular in three planes of the group of the papillary muscle dysfunction caused by posterior or inferior myocardial ischaemia or infarction by coronary artery disease, both Aα°, Pα°, and d(cm) was significantly different than the group of the control subjects during early systole and ately systole, respectively (p<0.01). Among of all planes of three patients was showed PA°<Aα°, but rest both PA°>Aα°. Whereas the geometric angles between the mitral valve leaflets and mitral valve annular in three planes of the another group (20 cases patients of the papillary muscle dysfunction caused by posterior or inferior myocardial ischaemia or infarction by coronary artery disease) after complex mitral valve repair including placement of an annular ring with or without concurrent repair of mitral leaflet tissue itself was showed both Aα°, Pα°, and d(cm) no significant difference than control subjects during early systole and lately systole, respectively (p>0.05). Determination of the severity of the mitral regurgitation by proximal isovelocity surface area (PISA) by color Doppler flow imaging (CDFI). In the group of the papillary muscle dysfunction, effective regurgitant orifice (ERO, cm²) ranged from 0.20 cm² to 0.67 cm² (0.41±0.11 cm²), which was significantly different from after the mitral valve surgical repair, where it ranged from 0 to 0.17 cm² (0.06±0.04 cm², p<0.01); also, in the group of the papillary muscle dysfunction, Area-max (cm²) ranged from 1.28 cm² to 3.91 cm² (2.20±0.77 cm²), which was significantly different from after the mitral valve surgical repair, where it ranged from 0.46 cm² to 1.75 cm² (0.85 ±0.36 cm², normal control subjects 0.64±0.23 cm², p<0.001).

**Conclusions**
The severity of mitral regurgitation with the papillary muscle dysfunction caused by coronary artery disease relies heavily on geometric maximum angles between mitral valve leaflets and mitral valve annular during early systole or lately systole (max angles r=0.85); likely it deformation from Aα° (r=0.55), and d(cm) (r=0.87). Therefore, TEE has been suggested as a helpful tool for differentiating the geometry angles between the mitral valve leaflets with the mitral valve annular planes and study of the mechanism of mitral regurgitation in the papillary muscle dysfunction.

**Methods**
Sixty-five patients with ACS and 75 controls with SAP with similar atherosclerotic risk profiles were studied. CT angiography was performed using a dual-source CT scanner before invasive catheterisation. The lesion characteristics that were assessed included luminal cross-sectional area (L-CSA), vascular cross-sectional area (V-CSA), plaque area, and degree of stenosis with DSCT and quantitative coronary angiography (QCA), and plaque types, mean and minimal CT density (HU), remodelling index, and the presence of ‘spotty’ calciﬁcations with DSCT.

**Results**
All parameters, including L-CSA, V-CSA, plaque area, and degree of stenosis showed a good correlation between DSCT and QCA (p<0.05). In comparison with stable lesions in SAP, culprit lesions in ACS had a much larger mean V-CSA (20.5±6.0 vs 14.8±4.8 mm²), plaque area (15.3±5.0 vs 11.1±3.5 mm²), and remodelling index (1.3±0.2 vs 1.0±0.4) (p<0.05). The prevalence of non-calciﬁed/calciﬁed/mixed plaque was 30/0/35 for culprit lesions in ACS compared with 25/15/35 for stable lesions in SAP (p<0.01). The proportion of ‘spotty’ calciﬁed plaque was 21.5% in ACS culprit lesions (14 of 65) compared with 1.3% for stable lesions in SAP (1/75). The mean HU and minimum HU of culprit lesions in ACS versus those in stable lesions of SAP were 92.6±43.2 vs 154.2±98.7 (p<0.01) and 45.9±34.7 vs 98.2±76.8 (p<0.01), respectively.

**Conclusions**
DSCT is feasible to quantify plaque and distinguish culprit lesions in ACS, which display a greater proportion of non-calciﬁed material and ‘spotty’ calciﬁcations, lower CT attenuation, and a higher remodelling index compared with stable lesions in SAP.

**GW23-e1161**
**VALUE, DISTRIBUTION, AND CORRELATION OF RIGHT VENTRICULAR END-DIASTOLIC VOLUME INDEX: A REAL-TIME 3-DIMENSIONAL ECHOCARDIOGRAPHY STUDY**

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**Objectives**
The volumetric evaluation and correlations of the right ventricle (RV) with real time 3-dimensional echocardiography (RT3DE) in a large cohort of patients have not been previously described.

**Methods**
This retrospective study comprised a review of 806 consecutive RT3DE examinations with quantitative evaluation of both the left and right ventricle. Examinations were excluded from analysis if there was disease or surgery that would directly affect the size of the RV (eg, intracardiac shunt, significant tricuspid or pulmonic regurgitation, etc) as well as poor ultrasound image quality, leaving a total of 701 studied for analysis. RV volumetric quantification was performed for all data using dedicated software.

**Results**
Linear regression analysis showed that left ventricular stroke volume index (LVSVI) significantly correlated with RV end-diastolic volume index (RVEDVI)(r=0.78, p<0.0001). Overall, 4% (28 of 701) of the patients had RVEDVI lower than 50 ml/m², 12% (84 of 701) of the patients had RVEDVI greater than 100 ml/m², and the rest of the patients were within 50 to 100 ml/m². Intraobserver and interobserver variability study demonstrated RV volumetric parameters were highly reproducible.

**Conclusions**
RT3DE is an accurate and robust technique for quantifying RV volume. In patients without known primary RV pathology, RV volume strongly correlated with left ventricular stroke volume.

**GW23-e0452**
**CHARACTERISATION BY DUAL-SOURCE CT OF CULPRIT LESIONS IN ACUTE CORONARY SYNDROMES COMPARED WITH STABLE ANGINA PECTORIS**

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**Objectives**
The advent of dual-source CT (DSCT) has enabled easy detection of atherosclerotic plaques and assessment of their composition and mechanical properties. This study assessed the value of DSCT in identifying the characteristics of culprit lesions in acute coronary syndrome (ACS) as compared with lesions stable angina pectoris (SAP).
GW23-e1451  ASSESSMENT OF ISOLATED LEFT VENTRICULAR NON-COMPACTION WITH CONTRAST ECHOCARDIOGRAPHY
doi:10.1136/heartjnl-2012-302920ad.30

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Objectives Isolated ventricular non-compaction (IVNC) is a rare form of primary cardiomyopathy, and is a cardiomyopathy considered to be caused by arrest of normal embryogenesis of the endocardium and myocardium. Echocardiography has been the preferred diagnostic procedure; however, the correct diagnosis is often missed or delayed, because this uncommon disease and its similarities to other disease of the myocardium and endocardium are not widely known. Intravenous ultrasound contrast agents are indicated for left ventricular (LV) opacification and improvement of LV endocardial border delineation in patients with suboptimal acoustic windows.

Methods We presented a series of adult patients with suspected IVNC on conventional 2D echocardiography and evaluate the incremental diagnostic value of contrast echocardiography. To calculate the non-compacted segments and the non-compacted/compacted thickness ratio (N/C), the thickness of the layers was measured at the site of maximal thickness in the apical 3 or 4 chamber view at end diastole on the conventional 2D and on the contrast echocardiography, respectively.

Results
1. Some of the small trabeculations and intertrabecular recesses, which were difficult to visible on standard echocardiography; could be more clearly showed on contrast echocardiography;
2. The non-compacted segments of the left ventricle were more with contrast than with standard echocardiography;
3. The N/C was hard to assess echocardiographically, but better with contrast enhancement;
4. The contrast echocardiography could be very helpful to confirm the connectional blood flow between the intertrabecular spaces and the LV cavity, which was low and missed using conventional color Doppler.

Conclusions The use of contrast can be helpful to improve visualization of trabeculations in patients with poor baseline echo images. Contrast echocardiography can show a clearer the delineation of the ventricular trabeculations and intertrabecular recesses, and the blood flow between cavity and recesses. Together with greater understanding and awareness, it is likely that an increased number of patients will be diagnosed with IVNC in an earlier disease stage.

GW23-e0830  A PRELIMINARY STUDY ON TEST EFFICIENCY OF ARTERIAL FUNCTION PARAMETERS IN NORMAL YOUTHS BY HIGH FREQUENCY ULTRASOUND COMBINED WITH EXERCISE STRESS TESTING
doi:10.1136/heartjnl-2012-302920ad.31

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Objectives To investigate the difference of carotid elasticity function by two-dimensional speckle tracking imaging (X-strain) combined with ultrasound RF signal vascular stiffness (Quantitative Arterial Stiffness, QAS) technique, before and after exercise stress test, analysis the difference between the left and right carotid artery function, and find function index that can sensitively reflect changes.

Methods 49 healthy young people were enrolled in this study, exercise stress test by using the improved Bruce scheme. Before and after exercise stress test, arterial function parameters were measured using QAS technology including arterial compliance (CC), arterial distensibility (DC), stiffness parameter α, β and pulse wave velocity (PWV); while the parameters reflecting arterial strain including endovascular circumferential strain (EN-CS), endovascular circumferential strain rate (EN-CSR), adventitial circumferential strain (EP-CS), adventitial circumferential strain rate (EP-CSR) were collected using the technique of X-strain. The parameters were compared before and after exercise, analysis the difference between the left and right carotid artery function, ROC curves were drawn by the basal arterial parameters before the exercise, comprising test efficiency of these parameters.

Results
1. Arterial function parameters CC, DC were lower (1.04±0.43 vs 1.44±0.45 mm²/kPa, 0.05±0.01 vs 0.04±0.02 kPa, p<0.05), while α, β and PWV were higher (1.19±0.17 vs 0.63±0.09, 2.51±0.36 vs 1.28±0.18, 5.84±1.16 vs 5.04±0.79 m/s, p<0.05) than that before the exercise; EN-CS, EN-CSR, EP-CS, EP-CSR were higher (9.10±2.23 vs 7.83±2.45%, 1.22±0.56 vs 0.83±0.20 S⁻¹, 7.94±3.63 vs 6.89±2.47%, 1.02±0.41 vs 0.71±0.25 S⁻¹, p<0.05) than that before the exercise.
2. Either before or after exercise stress test, CC, DC, α, β, PWV had no difference between the left and right carotid artery (p>0.05), EN-CS, EN-CSR, EP-CS, EP-CSR were the same (p>0.05).
3. The ROC curve analysis showed that, the area under the curve of CC>α>β>PWV>DC, respectively 0.728, 0.774, 0.765, 0.702, 0.691 (p<0.05), Z test showed no significant difference between the parameters (p>0.05); area under the curve of EP-CS>EN-CS, respectively 0.724 (p<0.05), 0.565 (p>0.05), Z test showed that EN-CSR and EP-CS have no significant difference (p>0.05).
4. The test efficiency of CC, DC, α, β, PWV and EN-CSR, EP-CSR reflecting changes in vascular function has no significant difference (p>0.05).

Conclusions The changes of arterial function before and after exercise are physiological. Arterial function between the left and right carotid artery have no difference. Ultrasonography arterial function parameters CC, DC, α, β, PWV, EN-CSR and EP-CSR have higher test efficiency than others.

GW23-e1543  ASSESSMENT OF LEFT VENTRICLE GEOMETRY AND FUNCTION PATTERN AFTER ARTERIAL SWITCH OPERATION FOR D-TRANSPOSITION OF THE GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM USING TWO-DIMENSIONAL ECHOCARDIOGRAPHY
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Objectives The aims of this report were to study the early and mid-term outcome in terms of LV geometry and function in patients with transposition of the great arteries with intact ventricular septum (TGA/IVS) undergoing arterial switch operation.

Methods Eighteen patients aged from 28 days to 5 years (median age 4.5 months) were followed up and divided into 2 groups by age: the TGA1 group (18 patients, 28 days–6 months) and the
TGA2 group (16 patients, 6 months–4 years). Thirty age-matched controls were also analysed. We used two-dimensional echocardiography to obtain ejection fraction (EF), isovolumic relaxation time (IVRT), mitral valve early (E) and late (A) inflow velocities and E/A, LV end-diastolic volume (EDV), end-systolic volume (ESV), LV posterior wall thickness (W), dimension (D) and length (L) at end diastolic phase, to calculate normalised isovolumic relaxation time (IVRTc), wall thickness index (W/D) and LV geometry index (D/L), and to compare these indexes between groups.

**Results** Compared with normal 1 group, W in TGA1 was higher (0.41±0.06 vs 0.36±0.05 p=0.022), but D had no significant statistical difference (2.08±0.21 vs 2.21±0.23 p=0.117), indicating W/D differed between groups (0.20±0.04 vs 0.16±0.01 p=0.001). However, there is no significant difference in EF, IVRT, E, A, E/A and D/L between the above two groups. No abnormalities were observed in TGA2 group. Both TGA groups and normal groups, EDV, ESV, L, D and W were increasing with age (p=0.000).

**Conclusions** Early after operation, LV is undergoing hypertrophy or hyperplasia in TGA/IVS but will be recovery in the middle-term period and the function is normal all the time indicating that the LV myocardium may avoid irreversible pathological changes if operated before the pattern of LV geometry alters. All in all, LV develops well in long-term.

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**GW23-e2162**  
**VALUE OF VELOCITY VECTOR IMAGING IN THE DETECTION OF THE LEFT VENTRICULAR SYSTOLIC DYSFUNCTION IN EARLY DIABETIC RATS**

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**Objectives** The aim of this study was to investigate the left ventricular systolic dysfunction in early diabetic rats with velocity vector imaging (VVI).

**Methods** The diabetes mellitus (DM) group comprised 12 male diabetic rats which were induced with streptozotocin. The control group comprised 12 normal male rats with matching of DM group. All rats underwent conventional echocardiography and VVI exam 5 weeks after diabetic model established. Two-dimensional echocardiographic cine loops were obtained from the left ventricular short-axis views at the papillary muscle level and were analysed with Siemens Syngo US Workplace 3.01 software. The peak systolic radial velocity (Vs), radial strain (SRs), radial strain rate (SRRs), circumferential strain (SCs), circumferential strain rate (SRCs) and the average of the every parameter in left ventricular six segments at the papillary muscle level were compared between the 2 groups.

**Results** There was no statistical difference in every conventional echocardiographic parameter (wall thickness, left ventricular size, left ventricular ejection fraction and fractional shortening) between the two groups. Compared with the control group, the SCs of interior wall (IW), SRcs of IW and anterior-interventricular septum (AS) in the DM group were significantly lower (−11.79±1.42 vs −15.59±2.51, p<0.05; −2.79±0.99 vs −3.95±1.32, p<0.05; −2.14±0.83 vs −3.22±0.91, p<0.01, respectively), and other VVI parameters in the DM group reduced, but there were not significant differences between the two groups.

**Conclusions** Velocity vector imaging can be used to detect the left ventricular systolic dysfunction in early diabetic rats and become an important tool in diagnosis of the diabetic cardiomyopathy. Circumferential strain (SCs) and strain rate (SRCs) may be more sensitive indices in detecting myocardial impairment.

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**GW23-e2319**  
**COMBINATION OF HIGH-FREQUENCY ULTRASOUND AND ECHO-TRACKING TECHNIQUE FOR EVALUATING THE IMPACT OF BLOOD LIPID ON CAROTID OF RHEUMATOID ARTHRITIS PATIENTS**

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**Objectives** To explore value of high-frequency ultrasonography (US) and echo-tracking (E-T) technique for evaluating the impact of different levels of blood lipid on carotid intima-media thickness (IMT) and stiffness of rheumatoid arthritis (RA) patients.

**Methods** 55 RA patients were divided into 2 groups (Group A and Group B) according to levels of blood lipid (Group A, high lipid level; Group B, normal lipid level), 50 healthy volunteers as controls in the Group C. Two-dimensional US examination was performed to evaluate the IMT and arterial plaque, and E-T technique was used to evaluate the stiffness parameters of bilateral carotid arteries.

**Results** Groups A had significantly thicker IMT and higher incidence of arterial plaque than Group B and Group C (all p<0.05), while there was no difference between the latter two groups (both p>0.05). The stiffness parameters were higher in Group A than in Group B and Group C (all p<0.05), and in Group B than in Group C (both p<0.05). The stiffness parameters were correlated positively with IMT, respectively (both p<0.05).

**Conclusions** High-frequency ultrasound and E-T technique can be effectively used to evaluate the IMT, arterial plaque and stiffness of carotid arteries of RA patients with different levels of blood lipid. Moreover, they also provide early change of artery elasticity because of carotid complication by RA.

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**GW23-e2452**  
**ASSESSMENT OF THE LEFT ATRIAL FUNCTION INDEX BY ECHOCARDIOGRAPHY IN THE EVALUATION OF LEFT HEART FUNCTION IN PATIENTS WITH ESSENTIAL HYPERTENSION**

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**Objectives** To evaluate the left atrial function with the left atrial function index in patients with essential hypertension using echocardiography.

**Methods** Sixty hypertensive patients and 31 normal controls were selected. The high, weight, diameter of left atrium (LAD), mitral annular motion velocity (Ea, Aa) and the outflow tract velocity time integral (LVOT-VTI) were measured, and the Ea/Aa was calculated. Maximal LA volume (LAESV), left atrial ejection fraction (LAEF) were measured using the biplane method of discs, and left atrial stroke volume (LASV) and left atrial function index (LAFI) were calculated.

**Results** The LAFI in the hypertensive patients group was depressed when compared with normal controls (0.53±0.19 vs 0.79±0.23 respectively, p<0.05). Among hypertensive patients, the LAFI of those having the larger LAD is lower than those having the normal LAD (0.47±0.18 vs 0.38±0.18 respectively, p<0.05). A linear regression analysis showed LAFI correlated well with Ea, Ea/Aa, LAEF LAFI negatively correlated with LAD and LASV.

**Conclusions** The left atrial function index depresses in hypertensive patients. It is a significant indicator in detecting the left atrial function.
GW23-e1302 DIAGNOSTIC ACCURACY OF TRANSTHORACIC ECHOCARDIOGRAPHY FOR PATENT FORAMEN OVALE: A SYSTEMATIC REVIEW AND META-ANALYSIS
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Objectives Patent foramen ovale (PFO) is a failure fusion of the primum and secundum atrial septa after birth and with a prevalence of 27% in the healthy population. It has been associated with cryptogenic stroke most common in patients younger than 55. Transesophageal echocardiography (TEE) has been considered as gold standard to diagnosis patent foramen ovale (PFO). But it is time-consuming and semi-invasive. The transthoracal echocardiography (TTE) is an optional method which is frequently used to screen this disease for it is a non-invasive and easier. But current evidence for its diagnostic accuracy for PFO is still unclear. We aimed to systematic review the diagnostic accuracy of TTE compared to TEE.

Methods Comprehensive searching in PubMed, Embase, and Cochrane library was conducted up to the end of October 2011. Two reviewers independently reviewed the results and excluded the data from each study. Study quality was assessed with the quality assessment for diagnostic accuracy studies (QUADAS). A random effect model was used to summary sensitivity and specificity. Summary receiver operating characteristic (SROC) curves were used to summarise overall test performance. Publication bias was assessed by Egger’s test as well as the funnel plot.

Results 15 studies including 1949 subjects were included in the meta-analysis. The quality of reported studies was modest. The summary sensitivity and specificity for TTE for diagnosing PFO was 88% (95% CI 77% to 94%) and 98% (95% CI 98% to 99%), respectively. The positive likelihood ratio is 45.3 (95% CI 12 to 166) and negative likelihood ratio is 0.12 (95% CI 0.07 to 0.24). The summary diagnostic OR was 362 (95% CI 95 to 1329). Although the Egger’s test and funnel plot showed a significant publication bias among studies, but pooled sensitivity and specificity only have a little change after removing the most heterogeneous study.

Conclusions The meta-analysis suggested that TTE is a test with high sensitivity and specificity for detecting PFO. It may be a useful and non-invasive modality for initial screening of significant PFO before the further investigation.

GW23-e1304 CLINICAL APPLICATION OF LEFT VENTRICULAR SYSTOLIC FUNCTION IN PATIENTS WITH RHEUMATIC MILD TO MODERATE MITRAL STENOSIS BY THREE-DIMENSIONAL ULTRASOUND SPECKLE TRACKING IMAGING
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Objectives To assess left ventricular (LV) global and regional systolic function in patients with pure mild to moderate rheumatic mitral stenosis (MS) by 3-dimensional ultrasound speckle tracking imaging (3D-STI)

Methods Fifty patients with pure mild to moderate rheumatic MS were enrolled in this study, 40 normal subjects matched with age and sex were selected as control groups. LV 3D-global longitudinal peak systolic strain, 3D-regional peak systolic strain in 16 segments of left ventricular basal, papillary muscle and apical levels were measured in all subjects by 3D-STI from the apical full—volume image and compared between groups. LV ejection fraction (LVEF) was acquired from 3D-STI.

Results Despite normal LV systolic function as assessed by ejection fraction, mean global longitudinal strain (GLS) was significantly reduced in patients with isolated mild to moderate rheumatic MS (p<0.05). Regional analysis demonstrated that patients with MS had a significantly reduced 3D-regional peak strain in all basal, and some mid (inferior, anteroseptal, posteroseptal) segments of the left ventricle. For other segments 3D-regional peak strain values were similar among the groups. A Pearson correlate revealed that LV GLS correlated with LVEF (r=0.601, p<0.001) in patients with isolated MS, and LV GLS correlated with LVEF in normal subjects (r=0.709, p<0.001).

Conclusions LV global 3D strain decreases in patients with pure mild to moderate rheumatic mitral stenosis in the subclinical period. 3D-STI can identify early abnormalities of LV systolic function in MS patients who had apparently normal LVEF.

GW23-e1329 EVALUATION OF LEFT VENTRICULAR TORSION AFTER ARTERIAL SWITCH OPERATION FOR D-TRANSPOSITION OF THE GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM BY TWO-DIMENSIONAL SPECKLE TRACKING IMAGING
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Objectives To evaluate anatomic left ventricular twist and untwist mechanics in patients of transposition of the great arteries with intact ventricular septum (TGA/IVS) up to 4 years after arterial switch operation using two dimensional ultrasound speckle tracking imaging (STI).

Methods 30 patients aged from 28 days to 4 years (median age was 4 months) were followed up and divided into 2 groups by age: the TGA1 group (17 patients, 28 days–6 months) and the TGA2 group (13 patients, 6 months–4 years). Thirty age-matched controls were also analysed. We obtained LV twist versus time and twist velocity versus time profiles by STI. The mean value of rotation at each plane, the peak twist, time to peak twist, peak twist velocity and time to peak twist velocity were measured respectively and the rate of LV untwisting, the normalised peak twist and peak untwisting velocity were calculated.

Results Compared with normal 1 group, the net and normalised peak twist in TGA1 group were reduced (11.78±4.77 vs 16.56±5.99, 3.45±1.51 vs 5.10±1.99 p<0.05) because of lower apical rotation (7.94±4.07 vs 13.16±5.95 p<0.05);the net and normalised peak untwisting velocity were also lower than the control group (−132.3±59.00 vs −204.20±81.50, −38.43±18.54 vs −61.37±23.63 p<0.05) while the rate of untwisting was higher (0.99 (1.05) vs 0.49 (0.64) p<0.05). No LV twist abnormalities were observed in TGA2 group.

Conclusions STI may distinguish the impairment of LV systolic function in TGA/IVS early after operation. But this is a transient process, in the middle-term period patients performed as good as normal children because of the internal twist characteristics were reserved. So the overall prognosis is good.
**GW23-e1112**  ASSESSMENT THE PAPILLARY MUSCLE FUNCTION OF FUNCTIONAL MITRAL REGURGITATION USING SPECKLE TRACKING TECHNOLOGY
doi:10.1136/heartjnl-2012-302920j.22
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**Objectives** To evaluate the function of left-side papillary muscles (PM) in ischaemic and non-ischaemic cardiomyopathy patients (ICM, NICM) with functional mitral regurgitation (FMR).

**Methods** Eighty control subjects were enrolled (group H). Sixty ICM patients with FMR were enrolled according to coronary angiography. Sixty NICM patients with FMR were enrolled as Contemporary definitions and classification of the cardiomyopathies. All patients were divided into three groups as the degree of FMR, mild FMR is group F1, moderate FMR is group F2, severe FMR is group F3. Standard transthoracic echocardiography were performed. All data were exported to Philips Qlab 8.1 workstation for 2D STI analysis. The parameters include: the longitudinal strain of anterior PM (APM), posterior PM (PPM) (ALS, PLS), the peak time of APM, PPM (AFT, FFT), and the delay time of peak value between APM and PPM (DT).

**Results** The results illustrate ALS and FLS decreased, the AFT, FFT, DT increased with increased of FMR degree (F>3.84, p<0.05). ALS, FLS have negative correlation with FMR and LV mass, have positive correlation with LVEF (p<0.05). DT has positive correlation with FMR and LV mass, has negative correlation with LVEF (p<0.05). No significant difference between ALS and FLS, AFT and FFT within group (p>0.05). In addition, compared with control subjects, there was significant alteration of PM acoustics and morphologic features in FMR patients.

**Conclusions** Our study found the PM longitudinal strain decreased with an increase of FMR degree, both of function and desynchronisation of APM and PPM play important role in FMR occurrence. Specifically, our results part explained the phenomenon that cardiac resynchronisation therapy can reduce the degree of FMR. So these findings may helpful to screen right patients for this therapy.

**GW23-e1306**  THE PRELIMINARY STUDY OF EVALUATION OF LEFT VENTRICULAR BULK ROTATION AND UNTWISTING IN HEART TRANSPLANT PATIENTS AT POSTOPERATIVE 3 MONTHS BY TWO-DIMENSIONAL ULTRASOUND SPECKLE TRACKING IMAGING
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**Objectives** To evaluate the change of left ventricular bulk rotation and untwisting in heart transplant patients at postoperative 3 months by two-dimensional ultrasound speckle tracking imaging (STI).

**Methods** There were 15 heart transplant patients without clinical rejection (11 male, 4 female, age range: 14-58 years, mean age: 41.7±14.5 years) who were at postoperative 3 months with medically controlled blood pressure showing <140/80 mm Hg. Two LV short-axis images at the basal and apical level were acquired in the 15 heart transplant patients and 56 healthy subjects (32 male, 24 female, age range: 15-63 years, mean age: 38.7±11.4 years). The data depicting the basal and apical LV rotation versus time profiles were acquired by STI software. LV bulk rotation at the time of aortic valve closure and the time of mitral valve opening, the peak degrees of LV bulk rotation and untwisting rate in diastole were measured.

**Results** 1. 14 patients were preoperatively diagnosed as dilated cardiomyopathy, and 1 patient was diagnosed as restrictive cardiomyopathy. Mean preoperative left ventricular ejection fraction of receptors, mean donor’s age, mean donor’s weight, mean extra-corporeal circulation time, mean aortic cross-clamping time,

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**GW23-e1305**  EFFECT OF SURGICAL CORRECTION OF TETRALOGY OF FALLOT ON SHORT-TERM RIGHT VENTRICULAR FUNCTION AS DETERMINED BY ULTRASOUND TWO- DIMENSIONAL SPECKLE TRACKING IMAGING
doi:10.1136/heartjnl-2012-302920j.40
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**Objectives** The impact of surgical repair on short-term right ventricular (RV) function in patients with tetralogy of Fallot (TOF) is scarce. The purpose of our study is to assess RV regional and global function in patients with TOF before and after operation by ultrasound two-dimensional speckle tracking imaging. The surgery approach has no influence on postoperative RV function.

**Methods** Thirty-six patients with TOF before, 1 week after, 3 months after, and 6 months after operation were studied. RV longitudinal peak systolic strain (e), strain rate (SRs) in RV free wall and interventricular septum for basal, mid and apical segments were measured by ultrasound two-dimensional speckle tracking imaging. RV global longitudinal peak systolic strain (GLS) and strain rate (GLSRs) were also determined.

**Results** 1. Compared with controls, RV GLS and e of RV free wall for basal, mid and apical segments were significantly reduced in preoperative patients with TOF (p<0.05 for all), these parameters further decreased at 1 week after operation, and increased to preoperative level at 3 months and 6 months after operation, and but lower than those of controls. While e of interventricular septum for all segments were significantly reduced in preoperative patients, and did not decrease further at 1 week after operation, and increased to normal level at 3 months and 6 months after operation.

2. In comparison with controls, RV GLS and SRs of RV free wall for basal, mid and apical segments were significantly reduced in preoperative patients with TOF (p<0.05 for all), these parameters did not decrease further at 1 week after operation, and increased to normal level at 3 months and 6 months after operation. SRs of interventricular septum for all segments did not decrease in preoperative patients with TOF; these indices increased at 1 week after operation, followed by toward normal level at 3 months and 6 months after operation.

3. RV GLS and GLSRs were correlated inversely with the diameter of RV, QRS duration and age, and positively with tricuspid valvular annular peak systolic velocity (Sm). RV GLS and GLSRs had no correlation with the type of surgery. Age was the independent predictor of RV global strain and strain rate (β1=−0.212, P1=0.012; β2=−0.180, P2=0.055).

**Conclusions** RV regional and global function in patients with TOF can be improved after operation. The difference in RV free wall and interventricular septum postoperative recovery and RV transient changes after operation can be subtly analysed by ultrasound two-dimensional speckle tracking imaging. The surgery approach has no influence on early postoperative RV function. Course of disease inversely impacts on postoperative RV function.
mean cold ischaemia time and mean warm ischaemia time were
(26.5±5.6)%, (34.0±6.1) years, (63.3±6.3) kg, (111.9±10.0)
min, (49.1±10.4) min, (186.0±100.4) min, (261.7±44.7) s,
respectively.
2. Significant increases in heart rate, the inside diameters of left
atrium, right atrium and right ventricle, the thickness of inter-
ventricular septum and left ventricular posterior wall, isovolu-
mic relaxation time and E/e ratio, and significant decreases in e
value and a value were obtained in the heart transplant group,
compared with the normal control group (p<0.05). There were
no significant differences in age, gender, height, weight, body
mass index, left ventricular end-diastolic volume, left ventricular
end-systolic volume, left ventricular end-diastolic inside diam-
eter, left ventricular end-systolic inside diameter, left ventricular
ejection fraction, E value, A value, E/A ratio, e/a ratio between
the two groups (p>0.05).
3. There were no differences in the direction and degrees of left
ventricular bulk rotations. As viewed from the apex, the LV
performed a counterclockwise wring motion with a clockwise rota-
tion at the base and counterclockwise rotation at the apex in
systole in both groups, and performed a clockwise untwisting
motion with a counterclockwise untwisting at the base and
clockwise untwisting at the apex in diastole in both groups.
There were no significant differences in the degrees of LV bulk
rotation at the time of aortic valve closure and the time of mitral
valve opening, and the peak degrees of LV bulk rotation be-
tween the two groups (p=0.854, p=0.460, p=0.704, respect-
ively). Systolic rotation reached its peak value at end-systole in
both groups (heart transplant group 96.1±8.4% vs the normal
control group 100.5±6.3%, p=0.065, where 0~100% was sys-
tolic duration and 100~200% was diastolic duration).
4. Significant decreases in untwisting rate and trend untwisting
variables (untwisting at t=5, 10, 15, 20, 25, and 50% in diastole)
were obtained in the heart transplant group, compared with the
normal control group (p<0.01). No statistically significant cor-
relations between untwisting variables and preoperative left ven-
tricular ejection fraction of receptor, extracorporal circulation
time, aortic cross-clamping time, cold ischaemia time and warm
ischaemia time were found (p>0.05).
Conclusions There were no significant differences in the direction
and degrees of left ventricular bulk rotations and the time when
systolic rotation reached its peak value between the heart trans-
plant group and the normal control group. That was, the systolic
function of cardiac allografts was normal at postoperative 3 months.
Significant decreases in untwisting rate and trend untwisting
variables in the heart transplant group showed that the diastolic
function of cardiac allografts was impaired at postoperative 3 months.

GW23-e2643 STUDY OF LEFT VENTRICULAR ROTATION AND TORSION IN HYPERTHYROID BY SPECKLE TRACKING IMAGING
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Objectives Quantitative analysis of hyperthyroidism in patients
with left ventricular rotation and torsion motion by speckle track-
ing imaging (STI) to explore the hyperthyroidism in patients with
left ventricular systolic function.

Methods Select the 59 cases hyperthyroidism who first II31 treat-
ment and review cure and improvement after 6 month for the
study, divided into two groups according to duration. Group A:
duration of less than 6 months, 31 cases; B: duration of greater
than 6 months, 28 cases; Control group: 50 cases of sex and age
matched normal. Group A and B before treatment and after treat-
ment with the control group underwent routine ultrasound exam-
ination, collection and storage of the left ventricular apex level of
short-axis dynamic images of the cardiac cycle in all three, applica-
tion X-strain software analysis come to the heart of the heart and
the apex level, the rotation angle of sub-epicardial myocardial peak,
calculation of left ventricular heart, sub-epicardial myocardial
reverse angle peak, analysis the relations between the rotation
and torsion angle peak in cardiac structure and function para-
eters, heart rate, blood pressure and thyroid hormone levels and
other factors.

Results
1. Group A, B before and after treatment compared with the
control group, left ventricular structure and function parameters
(LVd, LVDs, IVSd, PWD, LVEF), the difference was not statis-
tically significant (p>0.05). B group before treatment, left ven-
tricular outflow tract velocity (LVOT-V) higher than that of the
control group (p<0.01) after treatment compared with control group
difference not statistically significant (p>0.05).
2. The apex level of the heart, sub-epicardial myocardial rotation
angle peak (EN-PAR, the EP-PAR) compared with Group A before
treatment EN-PAR, the EP-PAR higher than that in the control
group, EN-PAR, EP-PAR of Group B is lower than control group
(EN: 6.01±2.54 vs 5.18±2.17 vs 4.53±2.46 vs; EP: 2.31±1.06 vs 1.87±1.04 vs 1.54±0.78, p<0.01); after treatment, EN-PAR, EP-
PAR of A group than before treatment to improve B only EP-PAR
than before treatment improved (Group A: EN:5.27±2.11 vs 6.01
±2.54; EP:1.87±1.04 vs 2.31±1.06, GroupB: EN:4.81±2.17 vs 4.38
±2.46; EP:1.77±1.01 vs 1.54±1.01, p<0.01).
3. The heart of global left ventricular sub-epicardial myocardial
reverse angle peak (EN-PAR, EP-PAR) comparison of Group A
before treatment EN-PAR, EP-PAR higher than that in the
control group, B EN-PAR, EP-PAR lower the control group (EN:
11.18±4.04 vs 9.53±2.69 vs 7.77±3.53; EP: 4.46±1.58 vs 3.86
±1.22 vs 2.97±1.11, p<0.01); after treatment, EN-PAR, EP-PAR
of A and B improved (Group A: EN:9.83±2.60 vs 11.18±4.04; EP:
3.90±1.20 vs 4.46±1.58, Group B:EN: 9.01±2.69 vs 7.77
±3.35; EP: 3.93±1.11 vs 2.97±1.12, p<0.05) than before treat-
ment.
4. The level of the heart within the sub, epicardial myocardial
dislocation angle peak EN-PAR, EP-PAR Comparison of the
B group before treatment and after treatment EN-of PBR, the
EP-of PBR in the control group, no statistically significant
difference (p>0.05).
5. The apex of the heart, sub-epicardial myocardial rotation angle
peak SBP, HR, LVOT-V showed a negative correlation (p<0.01),
and thyroid hormone levels (FT3, FT4 and TSH) no correlation
(p>0.05).

Conclusions
1. Hyperthyroidism in patients with early heart apex level, the
adventitia of myocardial rotation and left ventricular peak
torsion angle increases, decreases with the extension of the
course.
2. Has not yet appeared hyperthyroid heart disease, hyperthyroid-
ism in patients with early left ventricular systolic function
enhanced with the extension of the course to reduce.
3. Short duration of the hyperthyroid patients after treatment, left
ventricular regional systolic function of recoverability, the dur-
ation of the elderly cannot be fully restored.
4. Change of the rotational motion of hyperthyroidism in patients
with myocardial and haemodynamic changes in.
5. STI can evaluate regional myocardial systolic function in patients with hyperthyroidism.

**GW23-e0541 PREDICTING CARDIAC RISK BY EVALUATING CORONARY Atherosclerosis WITH CTA FOR NON-CARDiac SURGERY**

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**Objectives**
While the coronary CT (CTA) has been used to judge coronary atherosclerosis, its value in predicting the cardiac risk before non-cardiac surgery remains controversial. The objective of the present study was to explore the role of CTA for predicting cardiac events in patients who were subject to undergo non-cardiac surgery.

**Methods**
Eighty-nine patients (male 56, mean age 65.1) with suspected coronary heart disease (CHD) were scheduled to receive non-cardiac surgery. The luminal stenosis and calcification score were evaluated. Operative sites included chests (n=29), abdomens and pelvis (n=26), large vessels (n=5), bones and joints (n=19) and other regions (n=12).

**Results**
In 89 patients, 75 patients (84.27%) were diagnosed as with atherosclerosis while 10 patients (11.24%) were without; 2 patients had coronary artery bypass surgery and 2 patients had implanted stents. According to the results of CTA, 12 operations (13.48%) were cancelled, and 8 (8.98%) were postponed after interventions. In practice, severe stenosis of coronary lumen had significant impact on surgery planning (p=0.004) while calcification score did not. In patients who underwent operation as scheduled, 1 had atrial fibrillation after operation.

**Conclusions**
For patients with suspected coronary atherosclerosis, severity of coronary stenosis is a major factor that would determine whether the subject was eligible for non-cardiac surgery or not. From the view of reducing fatal cardiac events during peri-operative period, CTA may provide parameters that can be used along with other risk evaluations. In this regard, further and larger-scale investigation is warranted.

**GW23-e0343 COMPARISON OF RADIATION DOSE FOR TWO DIGITAL RADIOPHIC SYSTEM IN CORONARY ANGIOGRAPHY PROCEDURE**

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**Objectives**
To evaluate the radiation dose to patients using flat-panel detector (FD) and image intensifier charge-coupled device (II-CCD) digital radiographic system in coronary angiography procedure.

**Methods**
Radiation dose and dose rate with FPD and II-CCD digital radiographic system in coronary angiography procedure were measured using a phantom and radiation detector. Measurements were carried out for three times with each digital radiographic system, and the arithmetic were calculated.

**Results**
For fluoroscopy, the phantom radiation dose with FPD digital radiographic system was reduced by 5.6% compared to II-CCD digital radiographic system. However, for digital cineangiography, the phantom radiation dose with FPD digital radiographic system was increased by 7.8%. Compared to II-CCD digital radiographic system, the total phantom radiation dose with FPD digital radiographic system were increased by 2.3% for completing the coronary angiography procedure.

**Conclusions**
This study demonstrates that, compared to II-CCD digital radiographic system, the phantom radiation dose and dose rates with FPD digital radiographic system were reduced for fluoroscopy during coronary angiography, but increased for digital cineangiography. The same increase was also observed for the total phantom radiation dose with FPD digital radiographic system. These findings suggest that, compared with II-CCD digital radiographic system, FPD digital radiographic system did not inherently reduce the radiation dose, although FPD digital radiographic system possess good detective quantum efficiency.

**GW23-e1315 ASSESSMENT OF LEFT VENTRICULAR global SYSTOLIC FUNCTION IN LONG-TERM SURVIVAL PATIENTS OVER HT OPERATION BY SPECKLE TRACKING IMAGING**

doi:10.1136/heartjnl-2012-302920ad.45

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**Objectives**
Left ventricular hypertrophy (LVH) caused myocardial dysfunction. LVH in postoperative patients with orthotopic heart transplantation was caused by variety factors. The aim of the study was to analysis the influence of LVH on left ventricular global systolic function by speckle tracking imaging (STI).

**Methods**
24 patients, who live longer than 1 year after heart transplantation, and 30 healthy volunteers are examined with two-dimensional echocardiography and Colour Doppler Flow Imaging (CDFI). These 24 patients are divided into two groups: one group of patients with left ventricular hypertrophy (HT-LVH), another with normal left ventricular mass (HT-NLVM). The short axis view of the left ventricular papillary muscle and the apical four-chamber view are acquired and stored in dynamic mode. Then they are analysed off-line in Qlab Analysis 7.1. We compare the global left ventricular longitudinal strain (GLS), global circumferential strain (GCSR) and GRS strain (GRSR). The global left ventricular function is evaluated, and the possible reasons are analysed.

**Results**
1. Left ventricular ejection fraction (LVEF) was no significant differences among the normal control group, HT-NLVM, HT-LVH (64.00±4.49 vs 62.65±4.73 vs 65.21±3.71 cm, all p>0.05). But IVST, PWT, LVM of three group, these of HT-NLVM was largest, and HT-LVH was larger (all p<0.05). LVEDD was not significan difference between normal control and HT-NLVM, but LVEDD of HT-LVH was higher than that of control and HT-NLVM (all p<0.05).

2. GRS, GRSR, GCS, GCSR, GLS, GLSR of HT-NLVM were lower than those of normal control (20.95±4.34 vs 29.69±3.38, −2.26±0.70 vs −3.02±0.49, −16.95±2.98 vs −19.17±2.00, 1.48±0.35 vs 1.72±0.28, −16.00±2.52 vs −17.96±1.63, 1.39±0.33 vs 1.64±0.25, respectively; all p<0.05), and those of HT-LVH were further lower than those of HT-NLVM (19.87±3.85 vs 20.95±4.34, −1.85±0.78 vs −2.26±0.70, −14.19±2.17 vs −16.95±2.98, 1.22±0.21 vs 1.48±0.35, −15.10±1.25 vs −16.00±2.52, 1.12±0.18 vs 1.39±0.33, respectively; all p<0.05).

3. GRS, GRSR, GCS, GCSR, GLS, GLSR were affected by increasing of LVM. The predictive value R² of LVM for GRS, GRSR, GCS, GCSR, GLS, GLSR was 0.527, 0.224, 0.593, 0.369, 0.525,
Conclusions Increasing of LVM in postoperative patients with HT resulted in left ventricular global systolic dysfunction. The prevention of postoperative LVH is beneficial to maintenance of LV myocardium contraction function.

Objectives To explore the clinical value of tricuspid annular displacement measured by tissue motion annular displacement (TMAD) technique in patients with atrial septal defect (ASD).

Methods Thirty-six patients with ASD were enrolled as patient group and twenty-three normal individuals were enrolled as controlled group. The inner diameter of main pulmonary artery (MPA), right atrium (RA), right ventricular (RV) and right ventricular ejection fraction (RVEF) were measured by two-dimensional echocardiography. The TAD of the two groups at right ventricular free wall, septum and the mid-point (recorded as T1, T2, Tm) were measured by TMAD technique and compared.

Results The T1, Tm of the patient group were lower than those of the controlled group ((19.1±4.8) mm vs (22.4±3.0) mm, (15.6±5.7) mm vs (19.0±2.2) mm, respectively, p<0.05). The T2 had no significant difference between the two groups.

Conclusions T1 and Tm of the patients were lower significantly than the normal individuals, so TMAD technique may be used to evaluate the right ventricular systolic function in patients with ASD.

Objectives To explore the value of high-frequency ultrasonography (US) for evaluating the impact of different levels of glycosylated haemoglobin (HbA1c) on carotid intima-medial thickness (IMT) and haemodynamics of newly diagnosed type 2 diabetes mellitus (T2DM) patients.

Methods Ninety newly diagnosed T2DM patients were divided into 2 groups (Group A and Group B) according to levels of HbA1c (Group A, HbA1c <6.5%; Group B, HbA1c ≥6.5%), whereas 60 healthy volunteers as controls in the Group C. High-frequency US examinations were performed to evaluate the IMT, arterial plaque and haemodynamics parameters of bilateral carotid arteries of each participant.

Results Both Group A and Group B had significantly thicker IMT than Group C (both p<0.05), and the IMT of Group B was thicker than that of Group A (p<0.05). The incidence of arterial plaque and plaque score were significantly higher in Group B than in Group A and Group C (both p<0.05), but there was no difference between the latter two groups (p>0.05). There were significant difference of haemodynamics parameters between Group A and Group C and between Group B and Group C (both p<0.05), while no difference between Group A and Group B (p>0.05).

Conclusions High-frequency ultrasound can be used to evaluate the IMT, arterial plaque and haemodynamics of carotid arteries of newly diagnosed T2DM patients with different levels of HbA1c, which provide early diagnosis of carotid complication due to T2DM.

Objectives 1 Clinical data: The patient, male, 39 years old, came to our hospital with a symptoms of breathing difficulty for 5 years, being serious for 2 years, systemic oedema for 1 month on 5 June 2011. The patient had no history of hypertension, coronary heart disease, hyperlipidaemia, diabetes, valvular disease of the heart, thyroid disease, and no family history of premature cardiovascular disease.

Methods 2 Discussion: Constrictive pericarditis (CP) is so fibrosis or calcification of the pericardium that ventricular diastolic filling is limited to produce a series of symptoms of circulatory disturbance. Most CP came from acute pericarditis and almost half the cases of it in our country are tuberculous in origin. In regions where tuberculosis is common, it is the cause in a large portion of cases.

Results From the examination of echocardiography we could see that the pericardium is thickened, regional wall motion is decreased, and the motion of ventricular is paradoxical contraction.

Conclusions It is difficult to differentiate artefact from calcification for common Chest CT due to beating heart and slower scanning speed. Compare with the common CT, the 64–128-slice spiral CT possess faster scanning speed and higher resolution to make it more suitable to diagnose constrictive pericarditis.

Objectives Using real-time three-dimensional echocardiography (RT-3DE) to compare the assessment of right ventricle and left ventricle in healthy adult in order to further prove the feasibility of this method and discuss the relationship between these two ventricles.

Methods Full-volume of RT-3DE was performed in 58 healthy adults to collect the 3D database of heart. Then the database was transmitted to the workstation and was analysed. The right ventricular end-diastolic volume (RVEDV), end-systolic volume (RVESV), stroke volume (RVSV) and ejection fraction (RVEF) were obtained in TomTec workstation. The left ventricular end-diastolic volume (LVEDV), end-systolic volume (LVESV), stroke volume...
LVESV, LVSV and LVEF were 69.4±17.8 ml, 26.5±8.3 ml, 42.9±11.7 ml and 62.0±6.5%, respectively. Correlations were found between the corresponding parameters of RV and LV (r=0.78, 0.62, 0.82 and 0.44, respectively). There was high correlation (r=0.82) and no significant difference (p=0.273) between RVSV and LVSV. RDWDV and LVEDV were higher than IVSEDV and LVEDV, respectively (p<0.001). But RVFE was lower than LVEF (p<0.001).

Conclusions The fact, there was high correlation and no significant difference between the stroke volume of right and left ventricle measured by RT-3DE, further proved the feasibility of RT-3DE to evaluate the volume and function of right and left ventricle. The correlation of the volume and function between right and left ventricle could prove the significance of interaction between them.

GW23-e1314 ASSESSMENT OF LEFT VENTRICULAR MASS IN POSTOPERATIVE PATIENTS WITH ORTHOTOPIC HEART TRANSPLANTATION BY ULTRASOUND ECHOCARDIOGRAPHY
doi:10.1136/heartjnl-2012-302920ad.50
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Objectives After orthotopic heart transplantation (HT), hypertension commonly occurs because of adverse effects of immunosuppression. Left ventricular hypertrophy (LVH) has been shown to predict increased cardiovascular morbidity and mortality. The aims of this study were to observation of LV structure changing over time in patients after HT, and to investigate the roles in LV remodeling.

Methods Conventional two-dimensional echocardiography to scan control healthy subjects and patients with HT after 3 months (A group), 6 months (B group), ≥12 months (C group) operation. Left ventricular end-diastolic dimension (LVEDD), inter ventricular septal end-diastolic thickness (IVST) and posterior end-diastolic wall thickness (PWT) were measured. Left ventricular mass (LVM) were calculated according to the formula by ASE recommended. Evaluate of LVH rate at 3 months, 6 months, and 1 year and above.

Results
1. LVEDD was no significant difference between each group (p>0.05). But IVST, PWT in each group of HT were larger than in control group, and in group C was larger than in group A and B (all p<0.05), but there were no significant difference between group A and B (p>0.05).
2. Value of LVM in HT groups were higher than in control group, and LVM was higher in group B and C than in group A (p<0.05), however, there were no statistically significant difference between group B and C (p>0.05).
3. LVH rate in group A, group B, group C was 20%, 34.6%, 54.2% respectively, increased with time of post operation. But the univariate analysis indicated that there was no significant correlation between LVM and postoperative time (r=0.28, p<0.05), and there were significantly related with the incidence of hypertension. In multivariate analysis, hypertension and acute rejection (AR) events were risk factors for causing LVH. Moreover, LVM in hypertension group of HT was higher than in non-hypertension group of HT (p<0.05), as well as of HT with AR.

Conclusions Increasing of LVM is common in postoperative patients with OHT, and some of them develop LVH, and the ratio of LVH increase continually with the time. Hypertension and AR events are risk factors for causing LVH.

GW23-e2644 CMR EVALUATION OF CARDIAC FUNCTION IN PATIENTS WITH METABOLIC SYNDROME IMPACT ON THE STUDY OF HYPERTENSION
doi:10.1136/heartjnl-2012-302920ad.51
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Objectives MRI in the evaluation of the metabolic syndrome (metabolic syndrome, MS) on left ventricular function in hypertensive patients in clinical application.

Methods the Materials and Methods 2.1, the study Collected in March 2011 June 2011 Taiyuan Central Hospital, Cardiology, Endocrinology, intervention wards and outpatient or inpatient treatment for patients with hypertension, repeated hospitalisation of patients with first hospitalisation prevail. According to the 2004 Chinese Medical Association Diabetes Branch of the Chinese population recommended for diagnostic criteria for metabolic syndrome (6): body mass index (BMI) ≥25 kg/m²; triglyceride (TG) ≥1.7 mmol/l; high-density lipoprotein—cholesterol (HDL-C) M <0.9 mmol/l, women <1.0 mmol/l; fasting plasma glucose (FPG) ≥6.1 mmol/l and (or) 2 h after glucose load glucose ≥7.8 mmol/l and (or) 2 h after glucose load glucose >7.8 mmol/l and (or) 2 h after glucose load glucose ≥7.8 mmol/l and (or) 2 h after glucose load glucose ≥7.8 mmol/l.

Conclusions Increasing of LVM is common in postoperative patients with OHT, and some of them develop LVH, and the ratio of LVH increase continually with the time. Hypertension and AR events are risk factors for causing LVH.
measurement of cardiac function, the application of semi-automatic depicting left ventricular short axis endocardial and epicardial contours. Obtained left ventricular volume—time curves, calculated left ventricular (LV) heart function parameters: Left ventricular end-diastolic volume (EDV), end-systolic volume (ESV), stroke volume (SV), cardiac output (CO), ejection fraction (EF), myocardial mass (MM), and left ventricular peak ejection rate (PER), peak ejection time (TPER), increased wall thickness ratio (TN). 2.24, statistical analysis Analysis using SPSS14.0 statistical package. Measurement data with the mean±SD (±s) that the differences between the groups of data into a separate group t test. Count data using χ² test, test level to take α=0.05, p<0.05 was considered statistically significant.

**Results** In normal control group, hypertension, high blood pressure metabolic syndrome group differences were statistically significant (p<0.05), such as: ejection fraction (EF) three groups were: left ventricular peak ejection rate (PER) three groups were (ml/sec): 71.60±7.52, 65.28±10.28, 59.28±8.46, peak ejection time (TTFR) three groups, respectively (msec): 493.77±138.41, 452.30±117.54, 319.55±80.59, peak filling rate (PFR) three groups were (ml/sec): 215.60±7.82, 65.88±10.28, 58.28±8.46, peak ejection time (TPFR) three groups were (ml/sec): 477.03±51.48, 443.51±112.43, 394.32±133.35, time to peak filling rate (TPFR) three groups, respectively (msec): 67.53±11.73, 183.17±23.55, 318.65±19.27.

**Conclusions** HMS and EH can cause changes in left ventricular function, and metabolic dysfunction may further aggravate this change; MRI can accurately determine the film HMS, EH patients with left ventricular heart function parameters, and good reproducibility.

**GW23-e2493** EXPERIMENTAL STUDY ON QUALITY INTIMA-MEDIA THICKNESS AND QUALITY ARTERIAL STIFFNESS IN EARLY ATHEROSCLEROSIS IN RABBITS
doi:10.1136/heartjnl-2012-302920ad.52
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**Objectives** To evaluate the characteristics for the changes and the feasibility of Quality Intima-Media Thickness (QIMT) and Quality Arterial Stiffness (QAS) in different pathological grades of atherosclerosis by using pathological indexes as the gold standards.

**Methods** After feeding with basic particle feeds for 1 week for adapting to study drugs. Recovery time, the primary outcome, was evaluated by a modified Steward score, a score of >or=6 means that the patient is awake or responds to verbal stimuli, has purposeful motor activity, and coughs on command. The time to reach a modified Steward score of >or=6 was recorded. Patients were monitored for respiratory (changes in oxygen status) and haemodynamic adverse effects (heart rate changes, blood pressure changes) until the second hour in the intensive care unit after the operation was concluded.

**Results** Normal circumstances, surgical time, Systolic and diastolic blood pressure values and intraoperative SpO₂ were not significantly different between groups in any study period (p>0.05). The recovery time was significantly longer in the K group than in the D group (11.5±3.5 vs 5.5±0.7 min; p<0.01). Heart rate values were significantly higher in the ketamine group at 5 min after femoral artery intubation (109.6±22.4 vs 85.5±10.1 beats/min), 10 min (112.8±20.2 vs 87.4±8.3 beats/min) and 30 min (110.0±19.4 vs 89.5±7.0 beats/min) perioperatively, and after femoral artery extubation (125.8±21.1 vs 91.2±9.5 beats/min) (all, p<0.05). In the D group, one patient experienced shivering; in the K group, two patients reported nausea. Neither respiratory depression nor severe hypotension (ie, >20% change over baseline or requiring intervention) was observed in any patient.

**Conclusions** In this small study, both dexmedetomidine and ketamine in combination with propofol were well tolerated in these paediatric patients who required VSD closure and no obvious side effects and complications. The recovery period was significantly shorter and a negligible effect on heart rate values in the D group.

**GW23-e1635** THE APPLICATION OF LARYNGEAL MASK AIRWAY FOR GENERAL ANAESTHESIA IN THE INTERVENTIONAL THERAPY OF CHILDREN WITH ATRIAL SEPTAL DEFECT
doi:10.1136/heartjnl-2012-302920ae.2
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**Objectives** To observe the feasibility and validity of remifentanil combined with propofol in general anaesthesia using LMA during paediatric patients undergoing transcatheter atrial septal defect (ASD) closure.

**Methods** Fifty children (ASA I-II) with ASD were randomly divided into two groups: group LMA (A, n=25) and group intubation (B, n=25). LMA was inserted followed by intravenous infusion of propofol 2 mg/kg and remifentanil 2 μg/kg in group A, while endotracheal intubation was set up following the using of propofol combinations in paediatric patients undergoing transcatheter ventricular septal defect (VSD) closure.

**Methods** 60 cases of selective choice to do interventional therapy in children with VSD were randomly divided into dexmedetomidine/propofol (D) group and ketamine/propofol (K) group. The D group received an infusion over 10 min of dexmedetomidine 1 μg/kg and propofol 2.0 mg/kg bolus for induction, then an infusion of dexmedetomidine 0.5 μg/kg/h and propofol 4 to 6 mg/kg/h for maintenance. In the K group, patients received the same dose of propofol and ketamine 1 mg/kg for induction and 0.5 mg/kg/h by infusion for maintenance. The procedure was performed using both fluoroscopy and transesophageal echocardiography. Haemodynamic data, respiratory rate, and oxygen saturation were recorded before and after induction, 1 and 5 min after femoral artery intubation, every 10 min thereafter during the procedure, and after femoral artery extubation by researchers blinded to the study drugs. Recovery time, the primary outcome, was evaluated by a modified Steward score, a score of >or=6 means that the patient is awake or responds to verbal stimuli, has purposeful motor activity, and coughs on command. The time to reach a modified Steward score of >or=6 was recorded. Patients were monitored for respiratory (changes in oxygen status) and haemodynamic adverse effects (heart rate changes, blood pressure changes) until the second hour in the intensive care unit after the operation was concluded.

**Results** Normal circumstances, surgical time, Systolic and diastolic blood pressure values and intraoperative SpO₂ were not significantly different between groups in any study period (p>0.05). The recovery time was significantly longer in the K group than in the D group (11.5±3.5 vs 5.5±0.7 min; p<0.01). Heart rate values were significantly higher in the ketamine group at 5 min after femoral artery intubation (109.6±22.4 vs 85.5±10.1 beats/min), 10 min (112.8±20.2 vs 87.4±8.3 beats/min) and 30 min (110.0±19.4 vs 89.5±7.0 beats/min) perioperatively, and after femoral artery extubation (125.8±21.1 vs 91.2±9.5 beats/min) (all, p<0.05). In the D group, one patient experienced shivering; in the K group, two patients reported nausea. Neither respiratory depression nor severe hypotension (ie, >20% change over baseline or requiring intervention) was observed in any patient.

**Conclusions** In this small study, both dexmedetomidine and ketamine in combination with propofol were well tolerated in these paediatric patients who required VSD closure and no obvious side effects and complications. The recovery period was significantly shorter and a negligible effect on heart rate values in the D group.
2 mg/kg and remifentanil 2 μg/kg and cisatracurium besylate 0.1 mg/kg in group B. Anaesthesia was maintained with intravenous infusion of propofol 4 mg/kg and remifentanil 0.1 μg/kg/min. The time for operation and recovery from anaesthesia, the values of HR, MAP, SPO2 was recorded at different time in two groups (before anaesthesia, before and after implantation of LMA or endotracheal tube, before and after the removal of LMA or endotracheal tube). Also, the first successful placement was compared in two groups.

Results There were no significant differences for general information in two groups. such as the time for operation (64±5 vs 68±6 min) and recovery (10±5 vs 9±1 min) from anaesthesia, the values of HR, MAP, SPO2 before induction, before the LMA (endotracheal) placed, before the removal of the LMA or endotracheal tube (p>0.05), however, the values of MAP (90.1±9.2 vs 115±11.6 mm Hg) (p<0.05) HR (101±15 vs 120±16 beats/min) (p<0.05) were significantly lower in group A than that in group B at application of endotracheal tube and the values of MAP (89.0±8.3 vs 116±10.5 mm Hg) (p<0.05) HR (99±11 vs 119±13 beats/min) (p<0.05) were significantly lower in group A than that in group B extubation points. Postoperative respiratory complications in group B was significantly higher than that in group A.

Conclusions Application of LMA for general anaesthesia in the interventional therapy of children with ASD not only could achieve an effect of haemodynamic-stabilisation, but also reduce postoperative respiratory complications because of its less response of stress.

Laboratory science and biological markers of cardiovascular disease

GW23-e2687 | METABOLIC PROFILING REVEALS DISTINCT PATTERNS OF CORONARY HEART DISEASE WITH HEART FAILURE

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Objectives Heart failure (HF) is a leading cause of morbidity and mortality worldwide and the mechanism of this syndrome is very complex. To make fast and accurate diagnosis and treatment of coronary heart disease (CHD) with heart failure is a main problem in our society. The syndrome is traditionally diagnosed based on ultrasound and laboratory testing. But heart failure without symptoms can be difficult to diagnosis. The aim of this study is to establish characteristic diagnosis pattern and look for new insights into different courses for HF. At the same time, to reveal what’s underlying molecular mechanism and potential biomarkers in the microcosmic level of HF is another objective.

Methods Coronary Heart Disease with heart failure animal model is preparation through the left coronary artery ligation. Cardiac function is judged by the collection of dynamic observation and behavioural indicators at different disease phase use the ECG and ultrasound. Then Gas chromatography coupled with mass spectrometry (GC-MS) and pattern recognition are applied to analyse spectra of CHD with HF after operated 4 days, 21 days and 45 days. The enriched KEGG biological pathways are analysed to explore the underlying molecular mechanism of the HF.

Results show that principal component analysis (PCA) can clearly separate the HF animals form control group. The metabolic spectrums in two groups are significantly different. The enriched KEGG biological pathways results suggest that the patterns involved in dysfunction of energy metabolism including Glucose and lipid disorders. After operated for 4 days, 21 days and 45 days, blood metabolites have changed significantly between model and sham group. Lipid metabolites such as hexadecanoic acid and octadecanoic acid and à-D-glucopyranoside in glucose metabolism are up-regulated obviously; especially the Citric acid in energy metabolism have been up-regulated seriously.

Conclusions Glucose metabolism and lipid metabolism disorders reinforce each other, resulting a deterioration of citric acid cycle in CHD with HF; citric acid, à-D-glucopyranoside, hexadecanoic acid, and octadecanoic acid contributed most to the syndrome classification together, and they may be used as clinical diagnosis pattern for CHD with HF. These findings also provided the substantial foundation for exploring the scientific connotation of CHD with HF.

GW23-e1444 | EFFECT OF CIGARETTE SMOKE EXTRACT ON THE EXPRESSION OF THROMBOMODULIN IN HUMAN ENDOTHELIAL CELLS

doi:10.1136/heartjnl-2012-302920af.2

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Objectives Cigarette smoking cause triggering of coronary thrombosis. However, the mechanism by which smoking cause arterial thrombosis remains unknown. Thrombomodulin (TM) is constitutively expressed on the endothelial cell surface. TM has a critical effect on anticoagulation and anti-inflammation. It is not clear the way leading to intravascular thrombosis whether cigarette smoking affect the expression of TM. Therefore, we studied the expression of thrombomodulin in Human Umbilical Vein Endothelial Cells (HUVECs) under different cigarette smoke extract conditions.

Methods CSE was prepared by a modification of Nakamura’s method. HUVEC were isolated and cultured in low serum endothelial cell medium. The third generation of HUVECs were incubated respectively with 0, 0.5%, 1%, 2.5% and 5% CSE for 6 h or exposed to 5% CSE for 0, 6, 12, 24, 48 h to determine the expression changes of TM protein and mRNA expression in HUVECs. RT-PCR and Flow cytometric analysis techniques were used for detecting TM mRNA and protein.

Results After 6-h exposure to CSE, the protein level of of endothelial TM in different concentrations (0.5%, 1%, 2.5%, 5%) reduced significantly (60.39±2.03, 56.55±1.47, 55.82±3.32, 53.70±3.95) compared to control group (67.45±1.22) (p<0.01), and the mRNA level of endothelial TM also decreased significantly (0.1859±0.0139, 0.1776±0.0156, 0.0853±0.0156, 0.0571±0.0123) compared to control group (0.2550±0.0345) (p<0.01). After stimulation with 5% CSE for 0, 6, 12, 24, 48 h, the levels of TM mRNA and protein decrease over time and reached the peak at 12 h (0.0244±0.0181, 0.30.51±0.61), which were significantly lower than that of control group (0.1858±0.0267, 66.4±1.56) (p<0.001).

Conclusions CSE significantly decreased the expression of TM in a time- and concentration-dependent fashion in HUVECs. That suggests cigarette smoking maybe according this way to lead to intravascular thrombosis.
**ABSTRACTS**

**GW23-e2658**  
MICRORNA-26 REGULATES RAT CARDIAC REMODELLING BY SUPPRESING GLYCOGEN SYNTHASE KINASE 3β

doi:10.1136/heartjnl-2012-302920af.3

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**Objectives**  
MicroRNA-26 (miR-26) was found to be down-regulated in the myocardium in cardiac remodelling animal models. Here we investigated the critical role of miR-26a/b on cardiac remodelling in vivo and in vitro.

**Methods**  
Rats which underwent sham or transverse abdominal aortic constriction (TAAC) surgery were divided into control and TAAC group. Cardiomyocytes (CMs) and cardiac fibroblasts (CFs) were isolated from neonatal Sprague-Dawley rats. QFPCR assay was applied to detect the expression levels of miR-26 a/b in the myocardial tissue and plasma of TAAC rats, and in CMs and CFs treated with angiotensinII(AngII). Gain- and loss-of-function studies were applied through overexpressing or inhibiting miR26a/b or Glycogen Synthase Kinase 3β (GSK3β) by liposomes transfecting.

**Results**  
The data demonstrated that the expression levels of miR-26a/b were down-regulated in cardiac tissues and plasma in TAAC rats, moreover in CMs and CFs treated with AngII. Furthermore, overexpression miR26a/b by transfected miR-26a/b mimics in CM or CF inhibited CM hypertrophy or CF collagen synthesis significantly, and down-regulating the expression levels of miR-26a/b by transfected miR-26a/b inhibitors in CM or CF led to opposite effects, suggesting that miR-26 was an anti-hypertrophy and anti-fibrosis gene. Through luciferase assay our study suggested that Glycogen Synthase Kinase 3β (GSK3β) gene that was negatively regulated by miR-26 in CM and CF may be a direct target of miR-26. Overexpression of miR-26 attenuates the endogenous GSK3β mRNA and protein levels followed by the inhibition of CM hypertrophy and CF collagen synthesis. Down-regulation of miR-26 reversed these effects. Furthermore, silence of GSK3β gene phenocopied the anti-hypertrophy and anti-fibrosis effects of miR-26, whereas overexpression of this protein attenuated the effects of miR-26.

**Conclusions**  
Our data highlight an important role of miR-26 in the control of pathological structural changes in rat heart, which may associated with suppressing the GSK3β signalling pathway, and implicate the potential application of miR-26 in diagnosis and therapy of cardiac remodelling.

**GW23-e1903**  
SIGNIFICANCE OF THE EXPRESSION OF REGULATORY T CELLS IN CARDIOMYOPATHY RATS

doi:10.1136/heartjnl-2012-302920af.5

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**Objectives**  
The purpose of this study is to explore the effect of immunosuppression in the pathogenesis and progression of dilated cardiomyopathy by investigating the changes of T regulatory cells in PBMC from adriamycin-induced dilated cardiomyopathy rats.

**Methods**  
50 healthy male SD rats were randomly divided into control group (CN, n=15) and model group (DCM, n=35). The DCM group was administered adriamycin intraperitoneally at a dose of 2.5 mg/kg, twice a week for 6 weeks while the control group received an equivalent volume of 0.9% Sodium Chloride Injection alone intraperitoneally. At 0, 3 and 8 week, PBMC of two groups were obtained and stained by monoclonal fluorescent antibody, then the alone or combined expression of CD25 and FoxP3 in CD4+ T lymphocytes were examined by flow cytometry. While echocardiographic measurements such as LVIDd, LVIDs and LVEF were obtained at 0 and 8 week. At last, fresh hearts were removed when the survival rats were killed and myocardial tissue sections were obtained and stained with Van-Gieson (VG) to analyse the histopathology changes.

**Results**  
Echocardiographic measurements revealed that LVIDd and LVIDs of DCM group were enlarged and LVEF of DCM group were decreased compared with control group, and there were statistically significant (p<0.01). The myocardial tissue sections presented that cardiocytes were hypertrophy, intercellular substance were swelling and widening, and myocardial fibrosis formed obviously than that of the control group, which showed that the models of adriamycin-induced dilated cardiomyopathy were established. Peripheral frequencies of CD4+CD25+ Treg, CD4+Foxp3+ Treg and CD4+CD25+Foxp3+ Treg cells were significantly decreased in DCM group compared with in control group ((6.95±1.37)% vs (8.32±1.46)% , p=0.013), ((8.08±0.98)% vs (9.48±1.58)% , p=0.007), ((4.76±0.22)% vs (6.67±0.99)% , p=0.000).

**Conclusions**  
The results of our study suggested that SNP rs11970286 might be risk factors for ventricular tachycardia in Chinese population. And QT interval may confer an intermediate phenotype. The identification of causal genes and mechanisms at the loci remains a major task.
GW23-e2655  THE EFFECT OF GHRELIN ON INFLAMMATORY MARKERS IN APNEIC PATIENTS WITH/WITHOUT CORONARY HEART DISEASE

doi:10.1136/heartjnl-2012-302920af.6

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Objectives  Inflammation is proven to be associated with obstructive sleep apnoea (OSA), as well as with heart disease (CHD). Ghrelin, as an anti-inflammatory factor, may play a key role in mediating the inflammation in apneic patients with/without CHD. Therefore, the aim of this study was to investigate ghrelin and pro-inflammatory cytokines in apneic patients with/without CHD and assess the effects of ghrelin on these cytokines.

Methods  Plasma levels of ghrelin, interleukin-6 (IL-6) and tumour necrosis factor α (TNF-α) were measured in 63 patients with newly diagnosed OSA and/or CHD. These patients were classified into three groups (21 with OSA, 21 with OSA and CHD, and 21 with CHD), matched for age, sex, body mass index, and the severity of OSA or CHD.

Results  Plasma ghrelin levels were increased, while IL-6 and TNF-α were decreased in OSA patients with or without CHD, when compared with similar clinical characteristics CHD controls. Specifically, the differences were statistically significant between patients with OSA alone and CHD alone (p<0.05). Furthermore, plasma ghrelin levels were positively correlated with AHI and negatively correlated with plasma TNF-α (p<0.05). These correlations remained after adjustment for waist and neck circumferences. However, there was no significant correlation between ghrelin and IL-6 (p<0.05).

Conclusions  In conclusion, our study found that increased plasma ghrelin levels might be associated with decreased TNF-α, independent of body fat distribution, suggesting that higher ghrelin may partially negate the pro-inflammatory effects of OSA. Further large-scale and prospective studies are needed to confirm these effects.

GW23-e2659  THE EFFECT OF PARP1 ON EXPRESSION OF IL-6, TNF-A AND INFARCTION AREA OF RATS DURING EARLY HEART ISCHAEMIA/REPERFUSION INJURY

doi:10.1136/heartjnl-2012-302920af.7

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Objectives  To investigate PARP1 impacts on the protein expression and changes in activity of rat hearts in ischaemia-reperfusion injury. Research the tumour necrosis factor-α (TNF-a), Interleukin-6 (IL-6) of rat heart ischaemia/reperfusion on the same period, and study these serum cytokines expression and infarction area after PARP1 was inhibited by its inhibitor 3-aminobenzamid (3-AB).

Methods  The rats (n=190) were randomly divided into sham group, ischaemia/reperfusion, Immunohistochemistry was used to examine the PARP1 expression at 15 min, 30 min, 1 h, 2 h, 4 h, 6 h, 24 h. TNF-a, IL-6 levels of serum and myocardial tissue were detected by ELISA. PARP inhibitor 3-AB and the equal volume of saline were given to sham group and PARP1-SAB group at 30 min after thoracotomy and 1 h after administration of reperfusion respectively, then testing the infarction area.

Results  1. The average optical density values on expression of PARP-1 of I/R reperfusion group at different time points (15 min, 30 min, 1 h, 2 h, 4 h, 6 h, 24 h) were 176.31±6.47, 181.07±7.58, 190.15±9.09, 208.02±16.04, 197.96±13.80, 195.31±2.65, 190.35±5.53, compared with sham group were significantly different (p<0.05).

2. At different time points, the content of TNF-a (18.05±2.49, 20.95±2.48, 32.96±2.85, 40.55±3.09, 39.07±2.41, 19.15±2.29, 38.81±2.56 pg/mg) and IL-6 (17.1±2.7, 20.8±3.5, 33.8±3.9, 39.0±5.9, 38.2±4.5, 19.1±2.1, 22.1±3.5 pg/mg) in the myocardium were all obviously expressed, compared with control group had significant difference (p<0.05).

3. At different time points, the content of TNF-a (18.05±2.49, 20.95±2.48, 32.96±2.85, 40.55±3.09, 39.07±2.41, 19.15±2.29, 38.81±2.56 pg/mg) and IL-6 (17.1±2.7, 20.8±3.5, 33.8±3.9, 39.0±3.9, 38.2±4.5, 19.1±2.1, 22.1±3.5 pg/mg) in the serum had significant difference compared with control group (p<0.05).

4. Left ventricular myocardial infarction area of I/R ischaemia 45 min, 2 H reperfusion group was 33.24±3.78%, compared with PARP-3AB group (20.02±2.12%) was higher (p<0.05).

Conclusions  1. The level of PARP1 of ischaemia-reperfusion myocardial and related cytokines IL-6, TNF-a were showed dynamic changes, reperfusion during 15 min to 2 H was gradually increasing, during 4 H to 6 H was gradually decline, at 24 H a slightly elevated.

2. PARP1-SAB inhibited the activity of PARP1 and the expression of cytokines.

3. It is important to apply PARP inhibitors in ischaemia-reperfusion early phase. PARP reduced infarct size.

GW23-e2238  DETECTION AND ANALYSIS ON PLASMA METABOLITES DISORDER IN CORONARY HEART DISEASE (UNSTABLE ANGINA PECTORIS) PATIENTS BASED ON NMR METABOLOMICS

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Objectives  To discuss the characteristics of plasma metabolites in coronary heart disease (unstable angina pectoris, UAP) patients, and explore the composition and concentration changes of the plasma metabolites. Explain the metabolic rules in vivo, pathogenesis and biological essence of UAP patients in the disease state.

Methods  45 cases of UAP in-patients, aged from 45 to 75, diagnosed and confirmed by coronary angiography, were selected. 15 cases of healthy people were selected as the control group. Varian UnityInova 600 M superconducting Fourier (nuclear magnetic resonance, NMR) spectrometer was applied to detect the plasma metabolites. Collect the data with the methods of CPMG and LED. Free induction decay signal was transferred into one dimensional NMR.

Results  39 endogenous metabolites had been detected. The micro molecule substances were aef-glucose, β-glucose, β-hydroxy isobutyric acid, β-hydroxybutyric acid, phenylalanine, alanine, acetone, choline, methionine, dimethylamine, glycine, glutamate methyleamine, glutamine, creatine, creatinine, inositol, methylamine, lysine, leucine, tyrosine, hippuric acid, ornithine, taurine, praline, carmine, lactic acid, tryptophan, threonine, aspartic acid, valine, isoleucine, acetyl glutamic acid, histidine, N acetyl glycoprotein. The macro molecule substances were unsaturated fatty acids, lipid compound, lipid, LDL/VLDL and HDL.

OPLS/O2PLS-DA integral matrix figures results showed: distribution region of UAP patients and healthy people could be
Changes of myeloperoxidase and ischaemia modified albumin in patients with coronary heart disease

GW23-e1759

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Objectives Myeloperoxidase (MPO) is an oxidant-generating enzyme expressed in neutrophils and macrophages and involved in the atherosclerosis. Ischaemia-modified albumin (IMA) has been demonstrated to be a biomarker of ischaemia associated with myocardial ischaemia ischaemia. Here we investigate the changes of MPO and IMA in patients with coronary heart disease.

Methods We performed a case-control study. 157 individuals who had angiographically proved atherosclerotic plaques in their coronary arteries (with ≥50% stenosis in at least one coronary vessel) were defined as the case group. 75 individuals without any stenosis in all coronary vessels were defined as controls. Total plasma MPO levels were measured by ELISA, hs-CRP by immunoturbidimetry, and IMA was assayed by the albumin cobalt binding test.

Results Mean total plasma MPO level was significantly higher in CHD patients than that in controls (332.05±167.56 pg/ml vs 277.81±142.68 pg/ml, p<0.05). Compared with the controls, IMA and hs-CRP level in CHD patients were much higher (p<0.05 and p<0.01). Plasma level of MPO was not correlated with IMA and hs-CRP level.

Conclusions MPO, IMA and hs-CRP all play a role in coronary heart disease, MPO is a inflammation biomarker independent of IMA and hs-CRP.

A novel mutation in YWTD domain of LRP6 impairs endothelial cell function and lead to familial coronary artery disease

GW23-e2645

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Objectives PURPOSE: Our purpose is to identify the causal gene and its mechanism for familial coronary artery disease in Chinese Han Population.

Methods We recruited a large Chinese Han family with coronary artery diseases (CAD), which was ascertained through a proband, who was diagnosed as myocardial infarction at age of 42. The affected family had three generations consisting of 16 patients and non-affected first-order relatives. In order to seek for the genetic causes for CAD in this family, we sequenced all exons and intron-exon boundaries of LRP6, low density lipoprotein receptor-related protein 6, in which one mutation (R611C) was found to cause familial CAD in an Iranian population.

Results A heterozygous variant in exon 6 of LRP6 was identified to be segregated with CAD phenotypes in this family. The variant, causing a substitution of histidine to lysine (Y418H), was located in an evolutionarily conserved domain YWTD (Tyr–Trp–Thr–Asp) and was not found in 500 unrelated healthy individuals. These suggested that Y418H was a novel mutation in LRP6 for CAD. Functional characterisation demonstrated that, unlike the known mutation (R611C) of LRP6, Y418H did not impair cellular LDL clearance significantly. However, it impaired the proliferation, migration, and survival of endothelial cells. Additionally, we found that Y418H weakened signalling pathway of WNT by impairing the function of LRP6 as a Wnt’s co-receptor. To assess the contribution of LRP6 to CAD, we screened LRP6 in additional 40 probands and didn’t find any mutations, suggesting that LRP6 may not be a major gene involved in the pathogenesis of CAD.

Conclusions Taken together, we identified a novel mutation in LRP6 gene causing familial CAD in Han Chinese population and revealed a new mechanism underlying familial CAD.

Association between myeloperoxidase and CD11b/CD18 on polymorphonuclear neutrophils in patients with coronary heart disease

GW23-e1758

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Objectives Atherosclerosis (AS) is an inflammatory disease. CD11b/CD18 integrins on PMNs and endothelial cell intercellular adhesion molecule-1 (ICAM-1) mediate PMN adhesion to VECs, resulting in localised tissue injury. Myeloperoxidase (MPO) produced by activated PMNs and monocytes is an important inflammation biomarker. The aim of this study was to retrospectively evaluate the association between myeloperoxidase (MPO) and CD11b/CD18 on polymorphonuclear neutrophils (PMNs) in patients with coronary heart disease.

Methods Total plasma MPO levels were measured by ELISA, CD11b/CD18 on the PMNs was measured by the Flow cytometry (FCM). Total cholesterol, triglyceride, low density lipoprotein cholesterol, high density lipoprotein cholesterol, white blood cell (WBC) and PMN count were measured.

Results Mean total plasma MPO level was significantly higher in CHD patients than that in controls (332.05±167.56 pg/ml vs 277.81±142.68 pg/ml, p<0.05). Compared with the controls, CD11b/CD18 level in CHD patients were much higher (53.7±24.1 MFI vs 23.0±10.2 MFI, p<0.01). The serum levels of MPO were not correlated with sex, age, high blood pressure, diabetes, TC, TG, LDL, HDL, but positively correlated with CD11b/CD18, WBC and PMN count.
Conclusions  MPO is a inflammation biomarker of coronary heart disease, it may play a role by CD11b/CD18 pathway.

GW23-e2657  MICRONA EXPRESSION AND IDENTIFICATION OF CD4+ T LYMPHOCYTE IN PATIENTS WITH ACUTE CORONARY SYNDROME

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Objectives  To screen differential microRNA expression profiles of CD4+T lymphocyte from the patients with acute coronary syndrome (ACS) and the healthy controls by microarray analysis technique. To elucidate the mechanism responsible for modulation of CD4+T lymphocyte and provide insights into the effects of miRNA on ACS.

Methods  Ten patients with ACS were enrolled in the study, and 10 patients with normal coronary artery angiogram were served as a control group. Blood samples were taken from peripheral vein and the CD4+ T lymphocytes were isolated from mononuclear cells prepared with Ficol–Hypaque density-gradients centrifugation from human peripheral blood by magnetic cell sorting system (MACS). The purity of CD4+ T lymphocytes was measured by flow cytometry analysis. The viable count was detected by the rejection experiment of trypan blue. Total RNA was abstracted from CD4+ T lymphocyte with Trizol reagent. MicroRNA was isolated and enriched of by use of Polyethylene Glycol from 40 μg total RNA. The microRNA extracted from CD4+ T lymphocytes was hybridised and microRNA expressions profiles of CD4+ T lymphocyte were screened with the Affymetrix GeneChip microRNA array. The image signal was scanned by Affymetrix GeneChip Scanner 3000 and analysed by Affymetrix GeneChip Command Console™ 1.1 software. Then the image signal was transformed into digital information, which was analysed with SAM software. The differentially expressed microRNA were identified that miRNA on ACS.

Results  The differentially expressed microRNA of CD4+T lymphocyte were identiﬁed with the Affymetrix microRNA array. The data was consistent with cardiomyocytes exposed to hypoxia/reoxygenation (H/R) (n=5). Recombinant adenoviral vectors were constructed to explore the functional role of miR-15b in cultured cardiomyocytes exposed to H/R. Overexpression of miR-15b enhanced cell apoptosis and the loss of mitochondrial membrane potential (ΔΨm) determined by flow cytometry analysis. Conversely, downexpression was cytoprotective. Furthermore, the inhibition of miR-15b increased the expression of Bcl-2 protein, suppressed the release of mitochondrial cytochrome c (Cyt-c) to cytosol and decreased the activity of caspase-3 and caspase-9.

Conclusions  MiR-15b may be the upstream regulator of mitochondrial signalling pathway of I/R induced apoptosis by targeting Bcl-2.

GW23-e2700  CONCOMITANT BRUGADA-LIKE AND SHORT QT ELECTROCARDIOGRAM LINKED TO SCN5A MUTATION

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Objectives  Mutations in the α-subunit of cardiac sodium channel gene SCN5A can lead to the overlapping phenotypes of both the Brugada and type 3 long QT syndromes. However, the combination of Brugada and a short QT phenotype resulting from mutation in SCN5A has not previously been described. A man with concomitant Brugada-like ST-T and short QT electrocardiogram was identified and the SCN5A gene was sequenced. Whole cell patch clamp analysis of HEK293 cells expressing a SCN5A channel with the patient’s sequence was used to investigate the biophysical properties of the channel. The patient with the family history of sudden death showed Brugada-like and short QT interval electrocardiogram. Sequence analysis of the coding region of the SCN5A gene, identified a G to A missense mutation at nucleotide site 2066 that resulted in an amino acid substitution of arginine to histidine at amino acid site 689 (R689H). Patch clamp analysis showed that the R689H failed to generate current when heterologously expressed in HEK293 cells, indicating it was a loss-of-function mutation. Our finding firstly shows that a R689H in SCN5A results in a loss of protein function and the co-existents of the
Brugada-like and short QT interval electrocardiogram phenotypes.

**Methods**

**Conclusions**

**THE VALUE OF NT-PRO BNP IN THE DIFFERENTIATION OF ACUTE DYSPNOEA IN THE EMERGENCY DEPARTMENT**

doi:10.1136/heartjnl-2012-302920ag.15

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**Objectives**
The aim of this study was to investigate the value of NT-pro B-type natriuretic peptide (BNP) in the differentiation of acute dyspnoea in the emergency department.

**Methods**
The level of NT-pro BNP of 128 patients, who presented with acute dyspnoea caused by congestive heart failure or non-CHF, were tested by ELISA and compared.

**Results**
The NT-pro BNP level of the patients with dyspnoea caused by CHF were obviously higher than those of patients with non-cardiogenic dyspnoea (p<0.01). The level of NT-pro BNP was significantly different among different stages of heart function in CHF group and without correlation with left ventricular ejection fraction (LVEF).

**Conclusions**
Our results indicate that NT-pro BNP assays have a high degree of diagnostic accuracy and clinical relevance for CHF.

**WHAT IMPACTS DOOR-TO-BALLOON TIME–AN ANALYSIS FROM A SINGLE CENTRE IN A TERTIARY CARE GENERAL HOSPITAL**

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**Objectives**
Current data have shown that many factors impact Door-to-balloon (DTB) time in the patient of ST-elevation myocaridal infarction (STEMI). However, major factors are diverse in different region of China. Our study was aim to analyse the impact factors which significantly prolonged the DTB time in our hospital.

**Methods**
We analysed the DTB time and its components from January 2008 to December 2010 in 301 consecutive patients presenting with STEMI. Then, we determined which factors significantly prolonged the DTB time.

**Results**
The median DTB time of all the patients was 149±78 min, the group was divided by DTB time, <120 min group and>120 min group. The median DTB time of two groups were 87±29 min and 201±68 min respectively. The components of DTB time included that the time of diagnosis in ED (21±7 vs 22±4, p>0.05), the time of consultation of cardiologist (19±8 vs 50±21, p=0.000), the time of explaining condition (16±7 vs 36±42, p=0.000), transferred to catheterisation laboratory (12±5 vs 13±3, p>0.05), preparation of catheterisation laboratory in working hours (2±2 vs 9±2, p>0.05), preparation of catheterisation laboratory in on-call hours (40±6 vs 42±6, p>0.05). Besides, there were more STEMI patients presenting to hospital during working hour in <120 min group (31.9% vs 63.2%, p<0.05).

**Conclusions**
In our tertiary care general hospital, the time of consultation of cardiologist and explaining condition really account for the prolonged DTB time. What is more, the patients presented to hospital during working hour may shorten the DTB time. Therefore, directly awaking the catheterisation laboratory by emergency department and promoting the cognitive level of primary PCI in public may shorten DTB time.

**MICRONRNA-10A CAN RESTORE HUMAN MESCENHYMAL STEM CELL DIFFERENTIATION THROUGH KLF4**

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**Objectives**
Human mesenchymal stem cells (hMSC) are thought to be multipotent cells, which have the properties of self-regeneration
and differentiation plasticity, that can replicate and differentiate into lineages of mesenchymal tissues, including bone, fat, cartilage, tendon, muscle and marrow stroma. Human aging is a highly complex process that is characterised by an increase in age-associated diseases. Some studies have found that aging affects MSC function.

MicroRNAs (miRNAs) are posttranscriptional modulators of gene expression that are small, non-coding (typically 20 nt) and incorporate into the miRNA-induced silencing complex (RISC) to play an important role in many developmental processes. In a variety of cellular processes, such as cell survival, replicative senescence, proliferation and differentiation, miRNAs are key regulators. MiRNAs expression patterns change with age, and miRNA may directly affect the aging process. Recent studies have suggested that miRNAs change during MSC differentiation and that miRNAs play a critical role in MSC differentiation.

At present, few data exist to confirm the role of aging-related miRNAs in hMSC differentiation. This study profiled the miRNA expression of hMSC derived from young and old individuals and directly assessed the effects of these miRNAs during hMSC differentiation.

**Methods** Human bone marrow aspirates were obtained from the sternums of patients undergoing cardiac surgery. Young bone marrow was collected from patients aged 17–30, and old bone marrow was obtained mainly from patients aged 65–80 with valve disease. HMSC was immunostained with fluorescein conjugated antibodies to identify hMSC. Cell growth was evaluated using the cell proliferation assay for 7 consecutive days after plating. Growth curves were generated for young and old hMSC and compared. HMSC was induced to differentiate into three lineage differentiation (include of adipogenic, osteogenic and chondrogenic differentiation) by culturing in the differentiation medium. Immunohistochemistry stain and real time PCR were used to identify the differentiated cell and cell specific gene expression of adipocyte, osteoblast and chondroblast. The hMSC senescence was analysed by the β-galactosidase staining. The miRNAs expression in young and old hMSC was analysed by Affymetrix GeneChip 2.0 miRNA arrays and identified by real time PCR. Dual-luciferase gene report system was used to identify the target of miR-10a, miR-10a lentiviral constructs for over-expressing miR-10a, inhibiting the expression of miR-10a and KLF4 were used to detect the effect of miR-10a and KLF4 in hMSC proliferation, differentiation and cell senescence.

**Results** Compared with the young hMSC, the proliferate and differentiate potential of old hMSC were decreased. In old hMSC, both the percentage of SA-β-gal positive cells and the staining intensity increased. Although aged hMSC became senescent, the composition and expression level of MSC specific surface markers were not varied. Hsa-miR-196a, hsa-miR-378, hsa-miR-378-star, hsa-miR-486-5p and hsa-miR-644-star were up-regulated and hsa-miR-10a, hsa-miR-708 and hsa-miR-3197 were down-regulated in old subjects compared with young subjects. KLF4, identified by dual-luciferase gene report system, was the target of miR-10a. Over-expression of miR-10a can increase the differentiation of all three cell lineages in old and young hMSC and reduce cell senescence; conversely, proliferation was inhibited. Contrastingly, inhibiting miR-10a expression produced the opposite result. Directly suppressing KLF4 expression resulted in differentiation, reduced cell senescence and inhibit proliferation in both young and old hMSC.

**Conclusions**

1. In old hMSC, accompany with the age increased, the composition and expression level of MSC specific surface markers were not varied; the proliferate and three lineage differentiate potential were decreased; the cell senescence increased; miRNA expression was varied.
2. MicroRNA-10a can restore human mesenchymal stem cell differentiation through KLF4.

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**Objectives** Erectile dysfunction (ED) and coronary artery disease (CAD) often share common risk factors and there is growing evidence that ED might serve as a clinical marker for cardiovascular disease. Despite rising trends of CAD in Asian Indians, limited data are available on prevalence of ED and its correlation with CAD severity in such patients.

**Aim** To study the prevalence of ED in Asian Indian patients undergoing coronary angiography and assess if the severity of ED correlates with angiographic severity of CAD.

**Methods** The prevalence of ED was assessed using the International Index of Erectile Function IIEF-5 questionnaire, amongst 175 male patients undergoing coronary angiography. Any degree of Erectile Dysfunction was present in 70%; it was severe in 39.2%, moderate in 23.5%, mild to moderate in 22.7% and mild in 14.6%. Patients with ED had higher incidence of multi-vessel CAD (80% vs 36%, p = 0.001), diffuse CAD (81% vs 34%, p = 0.001) and higher number of mean coronary vessels involved compared to those without ED. Mean IIEF score in patients with single vessel, double vessel and triple vessel CAD was 18.4±5.8, 14.4±5.8 and 9.5±5.9 respectively (p = 0.001 for each group); mean IIEF-5 score for patients with diffuse CAD was also significantly lower (12.1±6.5) as compared to those without diffuse CAD (19.1±6.5, p < 0.001).

**Patients with severe ED** had higher prevalence of multi-vessel CAD and higher number of mean coronary vessels involved compared to those with milder grades of ED. Onset of symptoms of ED preceded symptoms of CAD by a mean of 24.6 months in 84% patients. Presence of severe ED was associated with a 21 fold higher risk of having triple vessel disease (OR 21.94, 95% CI 3.41 to 141.09, p = 0.001) and 18 fold higher risk of having diffuse angiographic CAD (OR 17.91, 95% CI 3.11 to 111.09, p = 0.001).

**Results** The prevalence of ED was assessed using the International Index of Erectile Function IIEF-5 questionnaire, amongst 175 male patients undergoing coronary angiography. Any degree of Erectile Dysfunction was present in 70%; it was severe in 39.2%, moderate in 23.5%, mild to moderate in 22.7% and mild in 14.6%. Patients with ED had higher incidence of multi-vessel CAD (80% vs 36%, p = 0.001), diffuse CAD (81% vs 34%, p = 0.001) and higher number of mean coronary vessels involved compared to those without ED. Mean IIEF score in patients with single vessel, double vessel and triple vessel CAD was 18.4±5.8, 14.4±5.8 and 9.5±5.9 respectively (p < 0.001 for each group); mean IIEF-5 score for patients with diffuse CAD was also significantly lower (12.1±6.5) as compared to those without diffuse CAD (19.1±6.5, p < 0.001).

**Patients with severe ED** had higher prevalence of multi-vessel CAD and higher number of mean coronary vessels involved compared to those with milder grades of ED. Onset of symptoms of ED preceded symptoms of CAD by a mean of 24.6 months in 84% patients. Presence of severe ED was associated with a 21 fold higher risk of having triple vessel disease (OR 21.94, 95% CI 3.41 to 141.09, p = 0.001) and 18 fold higher risk of having diffuse angiographic CAD.
CONCLUSIONS Asian Indians with angiographic CAD frequently have ED, symptoms of ED precede that of CAD in most patients. Incidence of multi-vessel and diffuse CAD is significantly more common in patients with ED. It is important for physicians to be aware of the close relationship between the two conditions so that patients with ED can have optimal risk stratification for concomitant CAD whenever required.

VALSARTAN INHIBITS AORTIC REMODELLING BY BLOCKING THROMBOSPONDIN-1 MEDIATED TRANSFORMING GROWTH FACTOR-β 1/SMADS PATHWAY IN DIABETIC RATS

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Objectives Angiotensin II (Ang II) and transforming growth factor β (TGFβ) are closely involved in the pathogenesis of diabetic complications. The aim of the study was to determine whether ablative thrombospordin 1 (TSP1) mediated TGFβ1/Smads signalling pathway specifically impacts vascular fibrosis and valsartan exerts an anti-fibrotic effect in diabetic rats.

Methods Age-matched male Wistar rats (200–240 g) were randomly divided into control group (n=8), diabetic group (n=16) and valsartan group (n=16). Type 2 diabetes mellitus (T2DM) was induced by high-calorie diet and streptozotocin injection. Morphological and biomechanical properties of thoracic aorta were assessed by echocardiography and cardiac catheterisation. Masson staining was used for histological evaluation of collagen. The expressions of components in TSP1 mediated TGFβ1/Smads signalling pathway were analysed by immunohistochemistry and real time quantitative reverse transcription PCR.

Results In comparison with controls, the thoracic aorta in diabetic rats was reduced in distensibility and compliance, with excessive collagen deposition. Components in TSP1 mediated TGFβ1/Smads signalling pathway including TSP1, TGFβ1, TGFβ type II receptor (TβRII), Smad2 and Smad3, were accumulated in the cytoplasm of vascular smooth muscle cells. Their protein and mRNA levels were up-regulated by hyperglycaemia. All these abnormalities were obviously attenuated by valsartan, an Ang II subtype 1 receptor blocker.

Conclusions TSP1-mediated TGFβ1/Smads activation plays an important role in macrovascular remodelling of T2DM. Valsartan can block the TSP1 mediated TGFβ1/Smads signalling pathway and alleviate vascular fibrosis.

CROSS TALK OF NF-κB CANONICAL AND NON-CANONICAL PATHWAY IN HUMAN AND MOUSE TISSUES

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Objectives Nuclear factor-κB (NF-κB) family are critical regulators in immunity, stress responses, apoptosis and differentiation, however, tissue NF-κB metabolism and their relevance to methylation status remain unknown.

Methods We examined gene expression profiles of 5 NF-κB transcription factors, 6 inhibitory IκB proteins (I-κB), 3 IκB kinase (IKK) complex and 24 pathway components in NF-κB signalling pathway. Data-base mining of NF-κB family members and components mRNA expressions are accomplished by querying GEO DataSets profiles under inflammation cytokine stimuli, hypomethylation status, and homocysteine treat. We analysed correlations between gene expression, S-adenosylhomocysteine (SAH), and S-adenosylmethionine (SAM) levels, and SAM/SAH ratios in 7 mouse tissues.

Results Our results showed that (1) NF-κB family members and pathway components have different expression levels in different tissues, and high expression in mouse, but inactive in human in normal condition; (2) Vascular system has lower response to NF-κB activity; (3) Tissues can be divided into 3 tiers according to essential molecular of NF-κB canonical and non-canonical pathway expression level in normal condition; (4) Canonical pathway is activated immediately after inflammatory cytokine TNF-α, IL-1 stimuli, but non-canonical pathway is up-regulated until 4 h treatment; (5) Lymphotixin β/LIGHT has no effect on NF-κB family members and components expressions at 4 h; (6) Sca1+ subset endothelial progenitor cells has lower NF-κB family members and components expressions level than Sca1− subset endothelial progenitor cells; (7) Most of NF-κB family members and components expressions are down-regulated by hypomethylation status; (8) Most of NF-κB family members and components expressions are down-regulated by acute homocysteine treat in different cell type.

Conclusions These new results provide an insight on the roles of NF-κB family members and components in tissues and cross talk between canonical and non-canonical pathway in different cell type, and its relevance to methylation. Our study is the first to make a model of specific tissue gene expression profiles of NF-κB and regulation of tissue methylation.

TISSUE PROPERTY OF OPTICAL COHERENCE TOMOGRAPHY IN RABBIT MODEL OF Atherosclerotic plaques

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Objectives Optical coherence tomography (OCT) is a high resolution intravascular imaging modality and can distinguish detailed coronary plaque components with high specificity and sensitivity. This study aimed to investigate the tissue property of OCT images for detecting plaque components.

Methods Carotid atherosclerosis was induced in New Zealand white rabbits fed a high-cholesterol diet for 20 weeks and subjected to balloon injury. At week 20, the right common carotid arteries were scanned by OCT. OCT signal intensity (NSD) and backscatter values was determined in a region of interest drawn in the lesion. Immunostaining was performed to with following monoclonal antibodies: an anti-smooth muscle α-actin antibody (sigma) to identify smooth muscle cells and anti-CD68 antibody (DAKO) to identify macrophages. Macrophage and smooth muscle cell density were quantified by immunohistochemical staining, and compared with the NSD and backscatter values.

Results A significant positive relationship between CD68-positive macrophage density and NSD was seen (r=0.653, p=0.009). A mild positive relationship between smooth muscle cell density and NSD was seen (r=0.179, p=0.05). A significant positive correlation between CD68-positive macrophage density and backscatter was seen (r=0.316, p=0.012). There was no significant correlation between smooth muscle cell density and backscatter was seen (p=0.41).
Conclusions  Tissue property of OCT may a useful marker to reflect the plaque inflammation and as a surrogate to dynamically evaluate the effects of anti-atherosclerotic interventions on plaque inflammation.

GW23-e1105  CLINICAL RESEARCH ON ASSOCIATION OF CD36 SINGLE NUCLEOTIDE POLYMORPHISMS WITH ESSENTIAL HYPERTENSION

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Objectives Genetic mechanisms contribute to blood pressure regulation. This study investigated whether CD36 gene single nucleotide polymorphisms (SNPs) were associated with essential hypertension in Chinese Han population residing in Jilin province.

Methods SNPs were detected using PCR-sequencing. The genotype was determined by restriction fragment length polymorphism–PCR (RFLP-PCR) or signal strand conformation polymorphism–PCR (SSCP-PCR) in a total number of 589 unrelated participants including 272 EH cases and 317 controls.

Results +216T/C, +273A/G, +132C/T, +217T/C, +212T/G and +233T/C were identified. Distributions of genotypes AA, GA and GG of +273A/G were significantly different (EH: AA58%, GA36%, GG16%; the controls: AA70%, GA25%, GG5%, χ²: 10.578, p<0.01), and G allelic frequency was higher in EHp<0.01, OR=1.629, 95% CI 1.224 to 2.168). No statistically associations were found in the other SNPs.

Conclusions +273A/G polymorphism in CD36 gene was associated with EH, and +273G could be an independent predictor.