Related Subjects: Biomarkers and Laboratory Testing for Cardiovascular Disease

e0674 INSULIN INDUCES PHOSPHORYLATION OF NDRG2 THROUGH ACTIVATION OF AKT IN CARDIOMYOCYTES DURING TRANSIENT ISCHAEMIA/REPERFUSION

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Aims The protein kinase Akt mediates an important cell-survival signalling of insulin through inhibition of apoptosis post cardiac ischaemia/reperfusion (I/R) injury. As Ndrg2 (N-Myc downstream-regulated gene 2) protein is one of Akt-mediated phosphorylation target in C2C12 skeletal muscle cell line, we evaluated whether insulin treatment could lead to Ndrg2 phosphorylation through Akt activation in rat cardiac tissue or cultured primary cardiomyocytes.
Methods Male Sprague-Dawley rats underwent 30 min of ligation of the left anterior descending coronary artery, followed by reperfusion for various periods. Western blot was applied to detect total and phosphorylated Akt and Ndrg2.
Results Our data showed that both Akt and Ndrg2 phosphorylation were increased by 30 min of ischaemia alone compared to those of control group, then they were gradually reduced by following reperfusion, reaching their respective lowest levels after 3 h of reperfusion. In addition, insulin treatment resulted in significant enhancement of phosphorylated Ndrg2 and Akt after 3 h of reperfusion. In vitro, insulin increased Ndrg2 phosphorylation in cardiomyocytes in a wortmannin- and 1L-6-hydroxymethyl-chiro-inositol-2(R)-2-O-methyl-3-O-octa-decyl-carbonate (HIMO)- inhibitable manner, whereas cavtratin, a selective eNOS inhibitor, had no such effect, supporting a likely direct role for Akt.
Conclusions we first demonstrated in rat cardiomyocytes that Ndrg2 phosphorylation level was modulated during transient I/R injury and could be enhanced by activation of Akt secondary to insulin treatment.

e0675 THE CLINICAL SIGNIFICANCE AND THE EXPRESSION OF N-TERMINAL PRO-BRAIN NATRIURETIC PEPTIDE IN PATIENTS WITH CHRONIC HEART FAILURE

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Objective To detect the N-terminal pro-brain natriuretic peptide (NT-proBNP) levels in patients with chronic heart failure, and to evaluate the difference of the levels in patients with chronic left and right heart failure.
Methods 1. 83 patients with chronic heart failure as the experimental group, and 25 patients without organic heart disease as the control group were included in the study. The patients in the experimental group were divided into left heart failure group (31 cases), right heart failure group (25 cases) and total cardiac failure group (27 cases), in which 25 patients of right heart failure group had chronic cor pulmonale, and the left heart failure and total cardiac failure group included 31 cases of coronary heart disease, 15 cases of hypertensive heart disease, 12 cases of heart valve disease. In the left heart failure and total cardiac failure group, the patients were further divided into three subgroups according to the classification of the New York Heart Academy (NYHA), including 17, 22 and 19 patients in Class II, III and IV, respectively; 2. Collected peripheral vein blood from each patient, and assayed the plasma NT-proBNP, creatinine (CRE), blood urea nitrogen (BUN), uric acid (UA), triglycerides (TG), total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C) and high density lipoprotein cholesterol (HDL-C) by ELISA; 3. Evaluated the left ventricular ejection fraction (LVEF), left ventricular end diastolic diameter (LVEDD), right ventricular end diastolic diameter (RVEDD) and ventricular septal thickness (IVST) of these patients by echocardiography; 4. SPSS11.5 was used for statistical analysis, statistical significance was established at $p<0.05$.
Results 1. The level of plasma NT-proBNP were 79.53±36.77 pg/ml, 2076.95±1024.32 pg/ml, 743.26±152.82 pg/ml and 4815.52±3165.98 pg/ml in the control group, the left heart failure group, the right heart failure group and the total cardiac failure group respectively ($p<0.05$); 2. The NT-proBNP was significantly increased with the heart function deteriorated, as observed of 1018.16±551.03 pg/ml, 2557.27±1582.38 pg/ml, 6359.77±2605.76 pg/ml, in the subgroups of NYHA ClassII, III and IV, respectively, which were all significant greater than that in Group Control. 3. The plasma NT-proBNP level of chronic cor pulmonale (743.26±152.82 pg/ml) was significantly lower than coronary heart disease (3670.48±1619.55 pg/ml), hypertension (3404.78±1056.10 pg/ml) and heart valve disease (2462.31±1130.25 pg/ml) ($p<0.05$); The plasma NT-proBNP level was no significant difference among coronary heart disease, hypertension and heart valve disease disease ($p>0.05$); 4. The plasma NT-proBNP level was negatively correlated with LVEF ($r=-0.425$, $p<0.05$), and positively correlated with BUN ($r=0.231$, $p<0.05$), CRE ($r=0.405$, $p<0.05$) and LVEDD ($r=0.371$, $p<0.05$), but had no correlation with age, UA, TC, TG, HDL-C, LDL-C, RVEDD and IVST ($p>0.05$). Multivariate stepwise regression analysis demonstrated that the CRE and LVEF were the independent factors influencing the plasma NT-proBNP level.
Conclusions 1. The plasma NT-proBNP level of the patients with chronic heart failure was higher than normal, and the plasma NT-proBNP levels were significantly increased with the severity of cardiac function classification, and it is good at reflecting the abnormal of cardiac function. The plasma NT-proBNP level of the left heart failure was significantly higher than the right heart failure. Furthermore detecting the plasma NT-proBNP levels can distinguish between cardiac dyspnoea and pulmonary dyspnoea; 2. The plasma NT-proBNP level of the total cardiac failure group was significantly higher than the other groups. The plasma NT-proBNP level is important to detect serious heart failure. The CRE of total cardiac failure group was higher than other groups. The highter CRE suggests that patients of serious heart failure are often accompanied with a decline of renal function; 3. The plasma NT-proBNP level was negatively correlated with the LVEF, and positively correlated with the BUN, CRE and LVEDD. The CRE and LVEF are independent impact factors effecting the plasma NT-proBNP level.

e0676 VALUE OF SERUM ADIPONECTIN LEVEL IN ATRIAL FIBRILLATION PATIENTS AND CLINICAL SIGNIFICANCE

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Objective To investigate the level of plasma adiponectin (APN) in atrial fibrillation (AF) patients and clinical value.
Methods 1. 40 AF patients hospitalised in cardiology department in our hospital divided into two groups of paroxysmal and persistent (containing persistent and permanent AF) according AF guideline of ACC/AHA 2006. Control group comprised 15 patients admitted to hospital in Cardiology Department without AF. Plasma adiponectin level were measured and compared among the three groups. 2. All

the patients fasting periphery venous flood acquired on the second morning, fasting plasma glucose (FPG), triglyeride (TG), low density lipoprotein-cholesterol (LDL-C), high density lipoprotein-cholesterol (HDL-C), creatinine (Cre) are tested by auto-biochemistry instrument, enzyme linked immunosorbent assay adopted. 3. Two-dimensional and Doppler echocardiography was performed using a Vivid 7 Dimension echo machine. Left ventricle end-diastolic diameter (LVEDD) and left atrial (LA) dimensions were standard M-mode measurements. Left ventricle ejection fraction (LVEF) was calculated using the modified Simpson's rule. 4. After centrifugation, 0.5 ml clear supernatant liquid of fasting periphery venous flood deserved in −80°C less than 5 months. APN concentration was measured by radio-immunity method. 5. Record each general state, including BMI, medicine taking, whether with or without hypertension, coronary heart disease and so on. All data are expressed as mean±SD. All analyses were performed using SPSS 17.0.

Results Adiponectin concentration in persistent AF was significantly higher than in control group and paroxymal group. Covariance analysis revealed that plasma adiponectin was also significantly associated with the presence of arterial fibrillation ($p<0.05$). Univariance analysis TG has influence on APN. Multiple linear regression show APN correlated negatively with TG, and APN in persistent AF group is higher than paroxymal AF group and controls.

Conclusion High plasma adiponectin levels are associated with the presence of persistent and permanent AF. Adiponectin concentration was correlated negatively with TG.

e0677 INCREASED PLASMA NTERMINAL PROBTYPE NATRIURETIC PEPTIDE IN PATIENTS WITH HEPATITIS C VIRUS INFECTION

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Objectives Some studies suggested a possible role for hepatitis C virus (HCV) in the pathogenesis of cardiovascular diseases (CVD). N-terminal pro-brain natriuretic pepetide (NT-proBNP) has been proposed to be a neurohumoral marker of cardiovascular risk. Few prior studies have evaluated such levels in HCV infection. Accordingly, the objectives of the present study were to investigate circulating levels of NT-proBNP and their relevance in patients with HCV infection.

Methods We collected 131 HCV-infected patients and 131 age and gender matched healthy individuals from January 2006 to October 2007 in China. Demographics, clinical data were collected and circulating NT-proBNP was analysed, and 63 of patients were also consecutively evaluated with echocardiography.

Results The level of serum NT-proBNP was higher in HCV-infected patients compared with controls (76.62 fmol/ml vs 51.83 fmol/ml, $p<0.001$, geometric means), even in HCV-infected patients without cardiovascular abnormalities (CVD history and /or abnormalities of ECG) NT-proBNP also increased (63.46 fmol/ml vs 48.14 fmol/ml, $p=0.015$, geometric means). A NT-proBNP level in the highest tertile was associated with a higher risk of cardiovascular abnormalities, with OR of 17.91 (95% CI, 3.71 to 86.47). MVE/MVA, LVEF and FS were significantly lower among patients in the highest NT-proBNP tertile, whereas MVA was higher. In addition, compared with normal values of healthy Chinese population (39.35%±4.26%), the value of FS (36.76%±5.50%, $p=0.015$) was lower in patients whose serum NT-proBNP level was higher than median of controls (>56.17 fmol/ml, n=37).

Conclusions HCV infected individuals had higher NT-proBNP levels than age matched controls, which show a possible cardiac functional evidence for a pathogenic link between HCV and CVD. The finding is consistent with an increased incidence of HCV or HCV antibody described in some CVD patients.

e0678 PROTEIN AND MRNA EXPRESSION OF CX40 IN CRISTA TERMINALIS OF PATIENTS SUFFERED FROM RHEUMATIC HEART DISEASE WITH CHRONIC ATRIAL FIBRILLATION

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Objective To investigate the protein expression and mRNA expression of Cx40 in crista terminalis of patients suffered from rheumatic heart disease with chronic atrial fibrillation. And evaluate the function of the remodelling of Cx40 in development and maintenance of atrial fibrillation in rheumatic heart disease.

Methods A small piece of myocardial specimen was acquired from crista terminalis during the operation in 20 patients who need operation therapy for rheumatic mitral valve disease and six patients undergoing other cardiac surgery served as control group. Western blot was used to detect expression of Cx40. Cx40 mRNA expression was detected by real-time fluorescence quantitative PCR method.

Results Compared with sinus rhythm, Cx40 expression was decreased in chronic atrial fibrillation. But, the difference of Cx40 mRNA expression among the three groups had no statistical significance.

Conclusion The remodelling of Cx40 plays an important role in the development and maintenance of atrial fibrillation in rheumatic heart disease. And the mechanism of the remodelling of Cx40 remains in the level after transcription of Cx40 gene.

e0679 DEVELOPMENT OF A RAPID QUANTITATIVE DETECTION OF NT-PROBNP BASED ON SUPERPARAMAGNETIC NANOPARTICLES AS LABELS IN THE LATERAL FLOW IMMUNOASSAY

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Objective To establish a lateral flow immunoassay (LFIA) system for rapid, economic and quantitative detection of N terminal pro brain natriuretic peptide (NT-proBNP).

Method In this study, superparamagnetic nanoparticles (MNPs) were used as labels, the immuno-nanoparticles were prepared by coupling monoclone antibody specific to NT-proBNP onto MNPs, then the immunonanoparticles were used to prepare the conjugate pad of the magnetic LFIA of NT-proBNP. Another monoclone antibody specific to NT-proBNP (capture antibody) and secondary antispecies antibodies were immobilised at test line and control line, respectively. Then the magnetic LFIA for detection of NT-proBNP were established and applied to test standard samples of different NT-proBNP concentrations. The magnetic field produced by MNPs in the test line are measured by a high sensitive magnetic assay reader. From the linear relation between magnetic signal intensities and NT-proBNP concentrations, we can achieve quantitative detection of NT-proBNP. Some factors which may influence the detection sensitivity of this system were also studied, such as the amount of antibody immobilised in the Test line and the amount of antibody per MNP.