pre-treatment with CGRP or SP in normal control rats were comparable to those of IPC. In addition, inhibition of CGRP or SP receptor essentially abolished the cardiac protective effects of IPC in normal control rats, but not in diabetic rats. IPC resulted in significant increase of CGRP and SP release in coronary effluent of normal control hearts, and which were effectively inhibited by TRPV1 receptor inhibitor, capsazepine or ruthenium red. However, IPC had no effects on CGRP and SP release in coronary effluent of diabetic hearts in the presence or absence of capsazepine or ruthenium red.
Conclusions Cardioprotection by IPC against ischaemia/reperfusion injury is lost during diabetes, and their underlying mechanism is partly associated with the decreased CGRP and SP release due to the impairment of TRPV1 receptor in diabetic hearts.

e0064 MICRO RNAS ARE INVOLVED IN THE PSYCHOLOGICAL STRESS-INDUCED CARDIAC DISORDERS IN RATS

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Objective Psychological stress has become an important factor in the development of cardiac disorders. MicroRNAs (miRNA) have been implicated in regulation of cardiovascular diseases. Therefore, we investigated whether miRNAs are involved in the psychological stress-induced cardiac disorders.
Methods Stress rat models were established by complex stimulation at different times during the daytime for 2 weeks. Body weight, blood pressure and ECG were measured) every 3 days during processing stress. Adrenocorticotrophic hormone (ACTH) was measured by using ELISA. Cardiac changes were detected by HE staining and electronic microscopy. MicroRNA microarray was used for analysing the differential expression of miRNAs.
Results After psychological stress, rats displayed change in behaviour. Body weight increased slowly and systolic blood pressure increased significantly in stress group from the 6th day to the 15th day. The ECG of all rats was normal before experiment. 2 weeks after stimulation the ECG record of different individuals in stress group showed different arrhythmia, including sinus tachycardia, atrial premature contraction, ventricular arrhythmia, and ST-T changes. Hypothalamic-pituitary-adrenal activity increased in stress group compared to control group by detecting ACTH. And the ultrastructure and histology showed injury changes in stress group. Compared to the control group, there were 55 different miRNAs in stress model including upregulation of 20 and downregulation of left, among which miRNA-141, miRNA−382, miRNA-219-5p and miRNA-296 up-regulate, miRNA-135a and miRNA-466b are significant down-regulate.
Conclusions Complex stimulation can induce psychological stress, which can cause cardiac injury. MiRNAs change in stress rat models, including upregulation of miR-141, miR−382, miR-219-5p and miR-296, and significant downregulation of miR-135a and miR-466b, which may play important roles in psychological stress-induced cardiac disorders. (Supported by research grant NSFC 30940041).

e0065 THE ASSOCIATION BETWEEN THE SINGLE NUCLEOTIDE POLYMORPHISMS OF MATRIX METALLOPROTEINASES AND THE CAROTID ATHEROSCLEROSIS IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Objective To investigate the relationship between the single nucleotide polymorphisms (SNP) of matrix metallo proteases (MMP-2 -735C/T; MMP-3 -1171 5A/6A) and the carotid atherosclerosis (CAS) in Chinese Han and Uygur populations with EH.
Methods The study comprised 276 Han nationality and 212 Uygur participants, who were divided into two groups: CAS (n=293) and NS (n=195). Genotypes were detected by PCR-RFLP and their frequencies were determined.
Results (1) The frequencies of MMP-2 TT genotype and T allele in CAS were higher than in NS (Han : X^2=11.441, p=0.003; Uygur : X^2=28.255, p=0.000). In NS, the frequencies of TT genotype and T allele in Han were higher than in Uygur (X^2=12.509, p=0.001)). (2) The frequencies of MMP−3 6A/6A genotype and 6A allele in CAS were higher than NS (Han: X^2=7.523, p=0.024; Uygur: X^2=6.474, p=0.039). The frequencies of MMP−3 6A/6A genotype and 6A allele in Han were higher than Uygur (CAS: X^2=26.230, p=0.000; NS: X^2=18.809, p=0.000). (3) The single gene analysis showed Han individuals with CT or TT genotypes had 2.25-fold risk and Han individuals with 6A/6A genotypes had 1.85-fold risk suffering from CAS. Han individuals with both T allele and 6A/6A genotypes had 3.17-fold risk suffering from CAS. The single gene analysis showed that Uygur individuals with CT or TT genotypes had 5.04-fold risk suffering from CAS. Uygur individuals with 6A/6A genotypes had 2.20-fold risk suffering from CAS. Uygur individuals with both T allele and 6A/6A genotypes had 3.20-fold risk suffering from CAS. (4)According to MMP-2 genetypes, Han individuals with MMP-2 CT+TT genotypes had higher LDL and lower HDL levels than CC genotype in CAS (LDL:2.9 mmol/l vs 2.6 mmol/l; HDL:1.2 mmol/l vs mmol/l). Uygur individuals with CT+TT genotypes had higher TG levels than CC genotype (CAS : 2.5 mmol/l vs 1.6 mmol/l; NS : 3.9 mmol/l vs 2.0 mmol/l). According to MMP−3, Han individuals with 6A/6A genotype had higher T-CHOL and LDL levels than 5A/5A+5A/6A genotypes in NS group (T-CHOL : 4.6 mmol/l vs 4.2 mmol/l; LDL: 2.3 mmol/l vs 2.2 mmol/l). (5) The binary logistic regression analysis showed MMP-2 CT+TT genetypes were the risk factors for CAS in individuals with EH (Uygur: OR=9.65; Han : OR=2.076). MMP-3 6A homogeneses were the risk factors for CAS in Han individuals with EH (OR=1.802). MMP-2 CT+TT and MMP-3 6A homogeneses had a combined influence on the incidence of CAS in Han individuals with EH.
Conclusions (1) Han and Uygur individuals had differential distribution of MMPs. (2) The SNP of MMP-2 -735C/T is associated with CAS in individuals with EH. The MMP-2 T allele may be a risk factors on CAS in individuals with EH. The SNP of MMP-3 -1171 5A/6A is associated with CAS in Han individuals with EH. The 6A allele may be a risk factors on CAS in Han individuals with EH.

e0066 ISCHAEMIC PRECONDITIONING COMBINED WITH GRADUAL REPERFUSION OFFERS NO ADDITIONAL BENEFIT ON MITOCHONDRIAL PERMEABILITY PORE OVER PRECONDITIONING OR GRADUAL REPERFUSION ALONE

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Objective Recent investigations demonstrate that ischaemic preconditioning and post-conditioning can reduce infarct size to the same degree. After reflow, opening of the mitochondrial permeability transition pore (mPTP) has been involved in lethal reperfusion injury. We hypothesised that the combination of ischaemic preconditioning and post-conditioning would result in greater

preservation of myocardium by offering additional effect on modulating mPTP opening.

Methods Anesthetized open-chest rabbits underwent 1.5-h regional ischaemia/1.5-h reperfusion and were divided into four groups: control(C), preconditioning (Pre-con), gradual reperfusion (GR), and preconditioning plus gradual reperfusion (Pre-con+ GR). Control hearts underwent no additional intervention. Preconditioning consisted of three cycles of 5 min of ischaemia and 5 min of reperfusion before the 1.5-h ischaemia. Gradual reperfusion hearts underwent 5 stages involving 10-s occlusion/50-s reperfusion, 20-s occlusion/40-s reperfusion, 30-s occlusion/30-s reperfusion, 40-s occlusion/20-s reperfusion, 50-s occlusion/10-s reperfusion starting 10 s after release of the index coronary occlusion. Preconditioning plus gradual reperfusion performed both interventions in preconditioning and gradual reperfusion. 1.5 h reperfusion later, mitochondria were isolated from the risk region myocardium, and mPTP opening was determined by using the mPTP kinetics method.

Results Preconditioning, and gradual reperfusion alone significantly limited infarct size, which averaged 7.21±4.76%, 5.36±1.90% of left ventricular weigh, respectively, versus 11.94±3.75% in controls ($p<0.05$ vs control). Preconditioning plus gradual reperfusion averaged 7.53±3.45% of left ventricular weigh offering no greater effect than preconditioning or gradual reperfusion alone ($p>0.05$). The $t_{1/2}$ of mPTP kinetics averaged 5.37±4.76 min, 5.27±4.76 min, in preconditioning and gradual reperfusion, respectively, significantly higher than the value of 5.06±4.76 min in controls ($p<0.05$). The $t_{1/2}$ of mPTP kinetics averaged 6.62±4.76 min in preconditioning plus gradual reperfusion, however, has no more effect than preconditioning or gradual reperfusion alone ($p>0.05$).

Conclusions The combination of ischaemic preconditioning and gradual reperfusion has no greater effect on mitochondrial permeability pore but provides more powerful anti-ischaemic protection than either intervention alone.

e0067 ASPIRIN ATTENUATES PULMONARY ARTERIAL HYPERTENSION IN RATS BY REDUCING PLASMA 5HYDROXYTRYPTAMINE LEVEL

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Pulmonary arterial hypertension (PAH) is characterised by increasing pulmonary pressure, right ventricular failure, and death. The typical pathological changes include medial hypertrophy, intimal fibrosis and in situ thrombosis. 5-HT and other factors contributed to the development of pathologic lesions. Aspirin (ASA), the platelet aggregation inhibitor, inhibits 5-HT release from platelet. The aim of the current study was to determine the efficacy of aspirin in preventing or attenuating pulmonary hypertension. Sprague-Dawley (SD) rats injected with monocrotaline (MCT) at day 0 developed severe PAH at day 31. Rats were randomised to receive either vehicle or different dosages of aspirin (ASA 0.5 mg/kg/d, ASA 1 mg/kg/d, ASA 2 mg/kg/d, ASA 4 mg/kg/d). Aspirin suppressed PAH and increased survival rate compared with the placebo group (84% vs 60%, $p<0.05$). Aspirin treatment also reduced right ventricular hypertrophy and pulmonary arterioles proliferation. Plasma 5-HT measured by High Performance Liquid Chromatographic (HPLC) was decreased in aspirin treated PAH model. The degree of 5-HT reduction was associated with systolic pulmonary arterial pressure, right ventricular hypertrophy and wall thickness of pulmonary arterioles in rats. These results showed ASA treatment has effectively attenuated MCT-induced pulmonary hypertension, right ventricular hypertrophy and occlusion of pulmonary artery. The effects of ASA may be associated with reduction of 5-HT.

e0068 INVESTIGATION OF VERAPAMIL IN REVERSING ALTERATIONS OF CELLULAR ELECTROPHYSIOLOGY UNDERLYING VENTRICULAR ARRHYTHMIA IN DOGS WITH MULTIPLE ORGAN DYSFUNCTION SYNDROME

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Objective The mechanism of Verapamil in reversing alterations of cellular electrophysiology underlying ventricular arrhythmia in dogs with multiple organ dysfunction syndrome (MODS) was not reported and their relationship to arrhythmogenesis was likely very limited.

Methods 12 dogs, of weight 8.67±0.75 kg, were divided into two groups: control group (n=6) and MODS group (n=6). MODS lasting for 72 h was induced. Ventricular myocytes were enzymatically isolated. Early afterdepolarizations (EAD), action potential durations (APD) and L-type calcium currents were assessed before and after Verapamil perfusion.

Results Sinus arrhythmias in all MODS dogs (100%; 6 of 6, n=6) and premature ventricular beats in 4 MODS dogs (66%; 4 of 6, n=6) were recorded, while no arrhythmias were found in control animals. The prolongation of APD associated with decreased L-type Ca^{2+} currents and frequent provocation of EAD were the typical electrophysiological alterations in myocytes of MODS dogs. The AP prolongation was shortened, L-type calcium currents was decreased, EAD was suppressed by using Verapamil (100 μmol/l) in ventricular myocytes of MODS dogs (66%; 4 of 6, n=6). EAD could be induced after elusion of Verapamil.

Conclusions The cellular electrophysiology changes within 72 h in the heart of MODS dogs were APD prolongation, markedly decreased L-type Ca^{2+} currents as well as frequently provoked EAD. Verapamil appears to be an effective agent in reversing the alternations of cellular electrophysiology in the early stage of MODS.

e0069 THE INFLUENCE OF NETWORK BETWEEN CERVICAL VAGUS TRUNK AND FAT PADS ON SINUS NODE FUNCTION, ERP OF ATRIAL AND PULMONARY VEINS AND ATRIA FIBRILLATION

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Objective To investigate the mechanism of influence of network between cervical vagus trunk and fat pads on sinus node function, ERP of atria and pulmonary veins and inducibility and maintenance of atria fibrillation.

Methods 7 dogs, of weight 14 to 18 kg, were placed under anaesthesia using sodium pentothal 30 mg/kg, midazolam 0.4 mg/kg IV and 0.05 mg/kg/h. Bipolar electrode catheters were placed into the right atrial, right ventricular and bundle branch for mapping and stimulating. The hearts were exposed via right thoracotomy to expose the SAN-FP (sinus-atrial node fad pad) and AVN-FP (atria ventricular node fad pad). Bipolar electrodes and ten-polar electrodes were fixed on the left atrial appendage and the pulmonary veins. Comparison of sinus rate (SR), effective refractive period (ERP) of atrial and pulmonary vein, and both inducibility and maintenance of atrial fibrillation were performed before and after sequential ablation of SAN-FP and AVN-FP.

Results (1) The heart rate (HR) decreased significantly from 133.0±13.5 ms and 130.0±15.9 ms to 32.6±20.4 ms and 85.6±33.2 ms by stimulating right and left cervical vagus trunk,