PROTECTIVE EFFECTS OF SITAGLIPTIN PRETREATMENT ON MYOCARDIAL ISCHAEMIA/REPERFUSION INJURY IN RATS

Zhang Peng, Chang Guanglei, Qin Shu, Zhang Dongying, Zhang Dongying. Department of Cardiology, The First Affiliated Hospital of Chong Qing Medical University

Objectives DPP4 inhibitors have been approved for antihyperglycemic agents. In addition to the insulinotropic effect, GLP-1 signalling was reported to have cardioprotective effects, but the precise mechanism remains unknown. In this study, we aimed to determine the cardiovascular responses of pretreatment with a DPP4 inhibitor-Sitagliptinin ischaemia/reperfusion rats and investigate its underlying mechanism.

Methods Twenty-four Male Sprague-Dawley rats were randomly divided into 3 groups: Sham group (n=8, lavaged with double-distilled water), Ischaemia/Reperfusion group (n=8, lavaged with double-distilled water), Sitagliptin group (n=8, lavaged with Sitagliptin, 50 mg/kg/day). After pretreated 2 weeks, rats in
Ischaemia/Reperfusion and Sitagliption groups were subjected to 30 min of coronary artery occlusion, followed by reperfusion for 2 h, and then the effect of Sitagliption on the cardiovascular responses were 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 Sitagliption group were significant lower than I/R group (CK-MB: 776.4±44.0 µ/l vs 1359.2±187.2 u/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).

Compared with I/R group, the GSH-Px and SOD level in Sitagliption group were significantly increased (GSH-Px: 241.8 ±12.9 u/ml vs 189.7±19.9 u/ml, p<0.01; SOD: 234.7±13.1 nmol/ml vs 163.3±25.2 nmol/ml, p<0.01), but still lower than those in Sham group (GSH-Px: 241.8±12.9 u/ml vs 282.6±15.6 u/ml, p<0.01; SOD: 234.71±13.1 nmol/ml vs 288.7±20.2 nmol/ml, p<0.01).

**Conclusions** Our results suggested sitagliption pretreatment could provide significantly cardio protective effects against ischaemia/reperfusion injury in rats. The mechanisms might be attributed to scavenging lipid peroxidation products, increasing antioxidant defense enzymes and preventing myocardial cell apoptosis.