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ROLE OF ISCHAEMIC POSTCONDITIONING REGULATES ENDOPLASMIC RETICULUM STRESS IN PREVENTION OF MYOCARDIAL REPERFUSION INJURYXin Zhao,¹ Xuefan Yu² ¹Department Of Cardiology, First Hospital Of Jilin University, Jilin, China; ²Department Of Neurology, First Hospital Of Jilin University, Jilin, China

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Acute myocardial infarction (AMI) is one of the leading causes of death in the world, demands early and complete reperfusion in therapy strategy. Reperfusion is the definitive treatment to salvage ischaemic myocardium from infarction. A primary determinant of infarct size is the duration of ischaemia. In myocardium that has not been irreversibly injured by ischaemia, reperfusion induces additional injury in the area at risk. Ischaemic postconditioning (IPO), brief intermittent ischaemia during the onset of reperfusion, both are known as endogenous protective mechanism, which could markedly limit myocardial infarction and render the myocardium more resistant to the subsequent I/R injury. Endoplasmic reticulum (ER) is the most important organelle in eukaryocyte, serving for macromolecules biosynthesis, stress action and calcium homeostasis adjusting. Recently study show that ischaemia/reperfusion injury (I/R) can affect ER function, namely ER stress (ERs). ERs induces ER molecular chaperones such as glucose-regulated proteins (GRPs), calreticulin (CRT), folding enzymes, and so on, which are protective and benefit for cell adaptation. However, when persistent or too intense, ERs

will induce and activate ER proapoptosis factors such as CHOP, caspase-12. This study aimed to elucidate Ischaemic postconditioning (IPO) whether attenuates I/R injury by suppressing ER stress-induced apoptosis.

Methods 30 healthy adult male Wistar rats were assigned randomly into ischaemia/reperfusion group (A, I/R), ischaemia postconditioning group (B, IPO), each group has 15 rats. Rats were used for Langendorff isolated heart perfusion. The hearts were subjected to global ischaemia for 30 min followed by 60 min reperfusion. Hearts treated by IPO were subjected to 10 s episodes of 6 alternate myocardial ischaemia/reperfusion applied at the end of the 30 min ischaemic period. The myocardial injury was evaluated by the levels of lactate dehydrogenase (LDH) and Creatine kinase (CK) in the coronary effluent. Ventricular haemodynamic parameters were also measured, include HR, LVSP. Left ventricular myocardial was separated and cut to five slice. After experiment, the myocardial was used for myocardial infarction size evaluated with TTC stained. The expression of GRP78 mRNA was detected by reverse transcription PCR (RT-PCR). CRT expression and caspase-12 activation were detected using Western blot analysis. Variables were analysed by one-way ANOVA for multiple comparisons, and a p value <0.05 was considered significant.

Results (1) Ischaemic postconditioning reduced LDH, CK and improved the haemodynamic parameters, and reduced myocardial infarction size ($23.40 \pm 4.3\%$ vs $56.76 \pm 5.1\%$, $p < 0.01$). (2) IPO on ERs molecules: expression/activation. I/R induced upregulation of Grp78 mRNA, CRT expression and caspase-12 activation, and IPO were found to increase the upregulation of Grp78 mRNA, and relieve CRT over-expression and caspase-12 activation induced by I/R.

Conclusion Ischaemic postconditioning (IPO) may synergically protect myocardium in isolated rat heart from ischaemia/reperfusion injury. IPO can increase the upregulation of Grp78 mRNA, and relieve CRT over-expression and caspase-12 activation induced by I/R.