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The Endoplasmic Reticulum Stress Signaling Pathways in Protection of Myocardium Ischemia/Reperfusion Injury Model Rats by Pioglitazone
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OBJECTIVES To observe influence of Pioglitazone on the changes of expression of GRP78 JNK/p-JNK and caspase-12 in Ischemia reperfusion in rats, and discuss the myocardial protective effect of pioglitazone to the endoplasmic reticulum stress way through the JNK pathway.

METHODS Forty male rats were randomly divided into four groups: sham operation group (n=10), ischemia-reperfusion group (n=10), pioglitazone 10 mg treated group (n=10), pioglitazone 10 mg treated and using SP600125 group (n=10). Left anterior descending coronary artery was ligated for 30 min and reperfused for 2 hour to establish the model of ischemia-reperfusion. The number of myocardial apoptotic cells were detected by TUNEL staining, the expression of GRP78 and caspase-12 protein were detected by immunohistochemical staining. Western blot was performed to detect the expression of JNK and p-JNK.

RESULTS

1. Myocardial cell apoptosis index myocardial cell apoptosis index in ischemia reperfusion group is (35.98±2.6%), sham operation group (1.87±0.13 %), pioglitazone group (2.70±0.08 %), pioglitazone combined SP600125 group (19.16±0.44%). Pioglitazone group AI is lower compared to the ischemia reperfusion group (P<0.05), but higher than that of the sham operation group (P<0.05). Though the pioglitazone combined SP600125 group AI is higher than that of ischemia reperfusion group, the difference was not statistically significant (P=0.05).

2. 2 GRP78 protein average integral optical density A10 A10 in ischemia-reperfusion group is 0.437±0.166, in sham operation group is 0.027±0.045, in pioglitazone group is 0.400±0.107, in pioglitazone combined SP600125 group is 0.385±0.257. The expression of GRP78 in pioglitazone group and Pioglitazone combined SP60025 group were lower than in ischemia reperfusion group (P<0.05), but higher than that of the sham operation group (P<0.05).

3. Caspase-12 protein average integral optical density For A10, ischemia-reperfusion group is 1.291±0.081, sham operation group is 0.171±0.070, pioglitazone group is 0.746±0.075, pioglitazone combined SP60025 group is 0.514±0.059, the expression of GRP78 in pioglitazone group and Pioglitazone combined SP60025 group were lower than in ischemia reperfusion group (P<0.05), but higher than that of the sham operation group (P<0.05).

4. JNK/p-JNK protein expression Compared with the sham group JNK protein expression did not change significantly, but its activated form p-JNK expression changes significantly, compared with the sham group p-JNK expression of I/R group increased 3.46 -fold (P<0.05), compared with I/R group p-JNK of pio group downregulated 1.22-fold (P<0.05), compared with pio group p-JNK of pioglitazone combined SP600125 downregulated 0.78-fold (P<0.05)

CONCLUSIONS Ischemia-reperfusion can activate JNK access and induce severe ER then aggravate cell apoptosis induced by ERS. Pioglitazone could reduce cell apoptosis induced by ERS, which are important protection factors, are mediated by JNK.

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Macrophage Migration Inhibitory Factor (MIF) Promotes the Expression of GLUT4 Glucose Transporter Through MEF2 and Zn2+ in Cardiomyocytes
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OBJECTIVES Evidence shows that both macrophage migration inhibitory factor (MIF) and GLUT4 glucose transporter are involved in...