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论著

波动性高糖诱导的内皮细胞凋亡与JNK信号转导途径

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摘要：

目的：观察波动性高糖对人血管内皮细胞凋亡的影响，并探讨其机制。 方法：波动性高糖（5.5或20 mmol/L）与恒定性高糖（20 mmol/L）作用于人脐静脉内皮细胞7 d，用Annexin V/PI双染流式细胞仪检测细胞凋亡率，Hoechst33258荧光染色观察凋亡形态学变化，比色法测定培养液中超氧化物岐化酶（SOD）活力和丙二醛（MDA）含量, Western 印迹测定磷酸化c-JunNH2-末端激酶（p-JNK）水平。结果：波动性高糖组的细胞凋亡率明显高于恒定性高糖组（P＜0.05），且其培养液中SOD活力降低（P＜0.05），MDA含量增加（P＜0.05），细胞p-JNK水平增高（P＜0.05）。JNK特异性抑制剂SP600125应用后降低了波动性高糖诱导的细胞凋亡率（P＜0.05）。抗氧化剂维生素C应用后抑制了细胞内p-JNK水平的升高（P＜0.05），降低了细胞凋亡率（P＜0.05）。结论：波动性高糖较恒定性高糖更易促发培养的人脐静脉内皮细胞凋亡，其机制可能与氧化应激水平增高，进而激活JNK信号转导途径有关。

关键词： 血管内皮细胞 波动性高糖 凋亡 氧化应激

Involvement of JNK signal transduction pathway in endothelial cell apoptosis induced by intermittent high glucose

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Abstract:

ObjectiveTo evaluate the effect of intermittent high glucose on the apoptosis of human umbilical vein endothelial cells (HUVECs) and its mechanism. MethodsIntermittent high glucose and constant high glucose were applied to HUVEC-12 for 7 days. Flow cytometer and fluorescent staining with Hoechst 33258 were used to detect apoptosis of HUVEC-12. The superoxide dismutase (SOD) activity and the content of malonaldehyde (MDA) in culture solution were detected with colorimetry， and the changes of p-JNK level were examined by Western blot. ResultsThe apoptosis rate was obviously higher in the intermittent high glucose group than that in the constant high glucose group (P＜0.05). The SOD activity was significantly lower in the intermittent high glucose group (P＜0.05), but MDA level was higher than those of constant high glucose(P＜0.05). SP600125, the inhibitor of JNK, decreased the apoptosis rate induced by intermittent high glucose (P＜0.05). Antioxidant (Vitamin C) inhibited the p-JNK, decreased the apoptosis rate (P＜0.05). ConclusionIntermittent high glucose is easier to worsen the proapoptotic effects on HUVECs than that of constant high glucose, which may account for the increased oxidative stress, and then activates JNK signal transduction pathway.

Keywords: vascular endothelial cells;intermittent high glucose;apoptosis;oxidative stress

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