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MECHANISM OF INCREASED EXPRESSION OF INFLAMMATORY FACTOR IN ENDOTHELIAL CELLS AS IT IS INCUBATED IN D-GLUCOSE

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Objectives To study the mechanism for increased expression of inflammatory factor in endothelial cells as it is incubated in D-glucose.

Methods The human umbilical vein endothelial cells (HUVECs) that isolated from newborn umbilical cord were cultured and verified as vascular endothelial cells by immunohistochemistry in vitro. Passage 2 cells were stimulated by D-glucose with different concentration and time respectively. Levels of ROS were studied with flow cytometry and MCP-1 mRNA expression was assayed by reverse-transcription PCR (RT-PCR).

Results Formation of ROS and transcript of MCP-1 were increased gradually as the HUVECs were incubated by high D-glucose, although there were no significant changes in 5.5 mmol/l group at different time point. 16.5 mmol/l and 25.0 mmol/l glucose significantly increased the formation of ROS within 24 h ($p<0.01$) in cultured HUVECs. The levels of ROS in 25.0 mmol/l group were higher than that in 16.5 mmol/l group as the HUVECs were treated for 12 h ($p<0.05$). The expression of MCP-1 increased slowly as the HUVECs were exposed to high concentration of glucose. But significant increase of MCP-1 expression were emerged in 25.0 mmol/l group as compare to 5.5 mmol/l group within 12 h ($p<0.05$) and 16.5 mmol/l group within 24 h ($p<0.05$), respectively.

Conclusions HUVECs will produce more ROS and other metabolic products as it incubated in D-glucose, which links the damage and dysfunction of VECs to D-glucose and cytokines around intimae. Reinforced expression of MCP-1 is the important mechanism which leads to the damage and dysfunction of VECs.