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Protective effects of blueberry anthocyanin on ox-LDL-induced apoptosis to human umbilical vein endothelial cells

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Background: Vascular endothelial cells (VEC) cover the vascular intimal surface as a barrier between the blood and tissues, can synthesize and secrete a variety of biologically active substances, play an important role in maintain homeostasis balance, but susceptible to the oxidative stress, which could induce injury to the VEC.

Objective: To investigate the protective effect and mechanism of blueberry anthocyanin on endothelial cells from the cell proliferation activity, cell cycle and Superoxide dismutase(SOD), Malondialdehyde (MDA) and glutathio (GSH) level.

Methods: Chosen human umbilical vein endothelial cells, conventional recovery and passaged, setup HUVEC oxidative stress model. 1 Cell groups: in vitro cultured human umbilical vein endothelial cells (HUVEC) were divided into control group (Control), LDL group (LDL), ox-LDL group (ox-LDL), ox-LDL+low-dose blueberry anthocyanin group (ox-LDL+high-dose blueberry anthocyanin group (ox-LDL+middle-dose blueberry anthocyanin group (ox-LDL+high-dose blueberry anthocyanin group (ox-LDL+high-dose blueberry anthocyanin group (ox-LDL+high-dose BBA); (2) Determine the drug concentration for the next experiment: Using MTT assay to check out cell activity, determine the optimal concentration of ox-LDL in inducing oxidative stress and the effectively protect concentration of blueberry anthocyanin; (3) Cell cycle were detected by Annexin V-FITC-labeled flow cytometry; (4) Detect the expression of SOD, MDA and GSH ; (5) Detect the intracellular ROS level.

Results: HUVEC oxidative stress was significantly increased after ox-LDL stimulated. Compared to ox-LDL group, SOD and GSH level of the ox-LDL+BBA Group was significantly increased, the expression of MDA decreased, the intracellular ROS level also in a downward trend.

Conclusions: 1. Ox-LDL can induce cultured endothelial cells oxidative stress. 2. Ox-LDL induced HUVEC oxidative stress may be related to the imbalance level of SOD, MDA and GSH. 3. Blueberry anthocyanin has inhibition effect of HUVEC oxidative stress, the blueberry anthocyanin can protect vascular endothelial cells, which plays a role in anti-atherosclerosis.

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