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HIGH DENSITY LIPOPROTEIN INDUCES RATS MESENCHYMAL STEM CELLS PROLIFERATION THROUGH ACTIVATING PI3K-AKT PATHWAY

Jianfeng Xu¹, Juying Qian¹, Xinxing Xie^{1,2}, Jianying Ma¹, Li Lin², Mingqiang Fu¹, Aijun Sun¹, Yunzeng Zou¹, Junbo Ge^{1,1} Zhongshan Hospital, Shanghai, China; ²Eastern Hospital, Hong kong, China

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Objective To explore the effect of high density lipoprotein (HDL) on the proliferation of mesenchymal stem cells (MSCs), and to elucidate the role of PI3K-Akt pathway in the potential regulation of it.

Methods MSCs were collected from the femora of Sprague-Dawley rats and were treated with HDL in different concentration (0, 20 ug/ml, 50 ug/ml, 100 ug/ml) for 24 h; and then were treated with HDL (50 ug/ml) for 24 h, 48 h and 72 h, respectively. The proliferation of MSCs in each group was compared by Cell Counting Kit-8 (CCK-8) and BrdU cell proliferation assay. The expression of phosphorylation of Akt was evaluated by Western Blotting. LY294002, an inhibitor of PI3K, was used to down-regulate the activity of PI3K-Akt pathway.

Results The results showed that HDL induces markedly MSCs proliferation in time- and concentration-dependent manner. Akt phosphorylation was significantly increased by 2.35-, 4.52-, and 5.89-folds after simulation by 20 ug/ml, 50 ug/ml and 100 ug/ml HDL for 24 h (p value all<0.05). And when incubated with HLD (50 ug/ml), the phosphorylation of Akt was activated at 15 min, and peaked at 60 min. With the use of LY294002, the proliferation of MSCs was attenuated by 32% (26~40%, p value<0.05) when treated with HLD (50 ug/ml) for 24 h.

Conclusion HDL improved the proliferation of MSCs in time- and concentration-dependant manner, and PI3K/Akt pathway was one of the underlying mechanisms involved in it.