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论著

1-磷酸鞘氨醇2型受体调控衰老内皮细胞的功能变化

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摘要： 目的：通过上调和沉默1-磷酸鞘氨醇2型受体(S1P2)的表达,探讨其对体外培养的脐静脉内皮细胞的功能影响.方法：采用转染外源S1P2受体质粒上调年轻脐静脉内皮细胞S1P2受体表达;应用RT-PCR和Western 印迹检测空白对照组、空载体组和过表达组细胞的S1P2受体表达;同时采用Matrigel胶种植法,观察3组脐静脉内皮细胞的体外管状样结构生成能力;划痕实验分析内皮细胞的损伤愈合能力;迁移实验分析内皮细胞的化学趋化能力.以及通过RNA干扰沉默衰老脐静脉内皮细胞S1P2受体的表达,观察细胞的功能改变.结果：上调年轻脐静脉内皮细胞S1P2受体表达后,过表达组内皮细胞的成管能力、损伤愈合能力和细胞迁移率均明显低于空白对照组和空载体组($P < 0.05$).RNA干扰沉默衰老脐静脉内皮细胞S1P2受体后,干扰组内皮细胞的管状样结构生成能力、损伤愈合能力和趋化能力均明显恢复,显著高于衰老内皮细胞组和干扰对照组($P < 0.05$).结论：S1P2受体调控体外衰老内皮细胞的趋化、形态发生和损伤愈合反应的功能变化.

关键词： 内皮细胞 衰老 1-磷酸鞘氨醇2型受体 RNA干扰

Senescent endothelial dysfunctions were mediated by S1P2 receptor in cultured human umbilical vein endothelial cells

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Abstract: Objective: To investigate the variation of senescent endothelial function by regulating the sphingosine-1-phosphate receptor type 2 (S1P2) expression in cultured human umbilical vein endothelial cells (HUVECs). Methods: The S1P2 receptor expression was regulated by transfecting the cDNA or shRNA of S1P2 in cultured HUVECs. The expression levels of S1P2 receptor in HUVECs were detected by RT-PCR and Western blot. EC chemotaxis was measured by the transwell migration assay. The wound healing assay was performed by a scratch wound model on EC monolayer. Matrigel morphogenesis assay was employed to assess the in vitro angiogenic responses. Results: After up-regulating the S1P2 expression in young ECs, the S1P-stimulated formation of a tubular-like network in Matrigel was dramatically diminished in transfected ECs ($P < 0.05$). Quantification of the wound healing assay showed that transfected ECs grew much slower than young ECs ($P < 0.05$). The chemotactic capability was significantly decreased in transfected ECs ($P < 0.05$). Furthermore, the senescent-associated impairments were revoked by the down-regulation of S1P2 receptor in senescent HUVECs. Conclusion: The impaired functions (chemotactic, wound-healing and morphogenetic responses) in senescent HUVECs in vitro are mediated by S1P2 receptor.

Keywords: endothelial cells aging S1P2 receptor RNA interference

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