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论著

Galectin-1 在高糖腹透液诱导人腹膜间皮细胞转分化中的作用

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摘要:

目的: 研究人腹膜间皮细胞(human peritoneal mesothelial cells,HPMCs) 中galectin-1 的表达和在高糖腹透液(peritoneal dialysate solution, PDS) 刺激下galectin-1 表达的变化及其与上皮细胞- 间充质细胞转分化(epithelial-to-mesenchymal transition,EMT) 的关系。**方法:** 以HPMCs 为研究对象,实验分为: 正常对照组(5.5 mmol/L 葡萄糖),含1.5% 葡萄糖的PDS(1.5% PDS) 组,2.5%PDS 组及4.25% PDS 组。培养48 h 后,采用实时定量PCR 和Western 印迹检测galectin-1,vimentin 和zo-1 mRNA 和蛋白的表达水平,分析galectin-1 与vimentin 和zo-1 表达的相关性。使用阳离子脂质体转染galectin-1 siRNA 至HPMCs 内,实验分为: 正常对照组(5.5mmol/L 葡萄糖),高糖组(4.25% PDS) 和转染组(galectin-1 siRNA +4.25% PDS)。观察galectin siRNA 干预后vimentin 和zo-1 mRNA 和蛋白的表达水平。**结果:** 不同浓度PDS 刺激HPMCs 48 h 后,与对照组比,galectin-1mRNA 表达上调,尤以4.25%PDS 组明显($P<0.05$),其蛋白水平的表达均明显上调($P<0.05$),且具有浓度依赖性;同时 vimentin mRNA 表达上调,以2.5%PDS 组和4.25%PDS 组更明显($P<0.05$),其蛋白水平的表达均明显上调($P<0.05$);而zo-1 mRNA 和蛋白水平的表达均明显下调($P<0.05$)。不同浓度高糖PDS 刺激下galectin-1 mRNA 和蛋白表达水平与vimentin mRNA 和蛋白表达水平呈正相关($P<0.05$);与zo-1 mRNA 和蛋白表达水平呈负相关($P<0.05$)。Galectin-1 siRNA 干预后vimentin mRNA 和蛋白水平的表达较高糖组明显下调($P<0.05$),而zo-1 mRNA 和蛋白水平的表达较高糖组明显上调($P<0.05$)。**结论:** Galectin-1 与高糖PDS诱导的HPMCs EMT 相关,galectin-1 siRNA 能够抑制高糖PDS 诱导的HPMCs 转分化。 Galectin-1 可能参与腹膜纤维化的发生环节,成为防治腹膜纤维化的新靶点。

关键词: galectin-1 高糖 腹透液 上皮细胞- 间充质细胞转分化 siRNA

Role of galectin-1 on epithelial-to-mesenchymal transition induced by high glucose peritoneal dialysate in human peritoneal mesothelial cells

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Abstract:

Objective: To investigate the expression of galectin-1 with the stimulation of peritoneal dialysis solution (PDS) and its role in the epithelial-to-mesenchymal transition (EMT) in human peritoneal mesothelial cells (HPMCs). Methods: HPMCs were stimulated with PDS containing different concentrations of high glucose (1.5%, 2.5%, and 4.25%). After 24 h, mRNA and protein expressions of galectin-1,vimentin, and zo-1 were analyzed with real-time PCR and Western blot, respectively. Liposome transfected siRNA technique was used to knock down the expression of galectin-1 and the effect of galectin-1 siRNA on the EMT of HPMCs was also observed under 4.25% PDS condition. Results: mRNA expression of galectin-1 in HPMCs increased in PDS groups, especially in group with 4.25% PDS ($P<0.05$). Protein expression of galectin-1 in HPMCs significantly increased in PDS groups with a dose dependent manner ($P<0.05$).Expression of vimentin in HPMCs significantly increased in PDS groups, especially in groups of 2.5% PDS and 4.25% PDS ($P<0.05$), but zo-1 expression markedly decreased ($P<0.05$). The expression of galectin-1 correlated positively with vimentin ($P<0.05$) but negatively with zo-1 ($P<0.05$). Expression of vimentin in groups of 4.25% PDS was markedly inhibited ($P<0.05$) by galectin-1 siRNA, whereas zo-1 expression was significantly increased ($P<0.05$). Conclusion: Galectin-1 can mediate high glucose PDS-induced EMT in HPMCs and may be a new target for the prevention and treatment of peritoneal fibrosis.

Keywords: galectin-1 high glucose peritoneal dialysate epithelial-to-mesenchymal transition siRNA

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