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基础医学

骨髓间充质干细胞与CD133+肾脏细胞对急性肾损伤的疗效

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摘要:

目的 探讨外源性给予骨髓间充质干细胞(MSCs)与CD133+肾脏细胞对缺血再灌注(I/R)诱导的急性肾损伤小鼠模型的保护作用。**方法** 雄性C57BL/6小鼠32只,分为正常对照组、I/R组、I/R+MSCs组、I/R+CD133+肾脏细胞组,每组8只。在各组模型建立后的第1、2、3、7天分别处死2只。获取动脉血,检测其血尿素氮(BUN)与肌酐(Cr)水平;切取肾组织,观察肾组织的病理改变,并对受损肾组织行急性肾小管坏死程度(ATN)评分。应用酶联免疫(ELISA)法检测肾组织匀浆中肿瘤坏死因子- α (TNF- α)、肝细胞生长因子(HGF)的水平。**结果** ① I/R+MSCs组术后BUN、Cr水平,ATN评分及TNF- α 水平高于正常对照组,而低于I/R组,以术后第7天的差异最为显著, $P<0.05$ 。I/R+MSCs组术后HGF水平低于正常对照组,高于I/R组,以术后第7天的差异最为显著, $P<0.05$ 。② I/R+CD133+肾脏细胞组的术后BUN、Cr水平,ATN评分及TNF- α 水平高于正常对照组,而低于I/R组,以术后第3天的差异最为显著, $P<0.01$ 。HGF的检测结果与之相反, I/R+CD133+肾脏细胞组术后HGF水平低于正常对照组,高于I/R组,以术后第3天的差异最为显著 ($P<0.01$)。③ I/R+CD133+肾脏细胞组与I/R+MSCs组比较,其术后BUN、Cr水平,ATN评分及TNF- α 水平较低, HGF水平较高 ($P<0.05$)。**结论** MSCs与CD133+肾脏细胞可能通过内分泌方式调控细胞因子,改善微环境,促进由I/R诱导的急性肾损伤恢复,而CD133+肾脏细胞对急性肾损伤的修复作用更为明显。

关键词: 间充质干细胞; CD133+肾脏细胞; 肾脏; 缺血再灌注损伤

Protective effect of bone marrow mesenchymal stem cells and CD133+ renal cells on acute renal injury

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Abstract:

Objective To investigate the protective effect of exogenous bone marrow mesenchymal stem cells (MSCs) and CD133+ renal cells in acute renal injury induced by ischemia/reperfusion. **Methods** A total of 32 male C57BL/6 mice were divided into the normal control group, I/R group, I/R+MSCs group and I/R+CD133+renal cell group, with 8 mice in each group. On the first, second, third and seventh day after the models were established, 2 mice in each group were sacrificed respectively. The blood was sampled to detect the level of blood urea nitrogen (BUN) and creatinine (Cr). The kidneys were prepared for paraffin sections, the pathological changes were observed, and the acute tubular necrosis (ATN) score of kidney tissue was evaluated. The levels of tumor necrosis factor- α (TNF- α) and hepatocyte growth factor (HGF) in kidney homogenate were detected by enzyme-linked immune sorbent assay (ELISA). **Results** ① The levels of the BUN, Cr, TNF- α and ATN score of the I/R+MSCs group were higher than those of the control group while lower than those of the I/R group, with the most significant difference on the 7th day after operation ($P<0.05$). The HGF level of the I/R+MSCs group was lower than that of the control group while higher than that of the I/R group, with the most significant difference on the 7th day after operation ($P<0.05$). ② The levels of the BUN, Cr, TNF- α and ATN score of the I/R+CD133+renal cell group were higher than those of the control group while lower than those of the I/R group, with the most significant difference on the 3rd day after operation ($P<0.01$). The HGF level of the I/R+CD133+renal cell group was lower than that of the control group while higher than that of the I/R group, with the most significant difference on the 3rd day after operation ($P<0.01$). ③ The levels of the BUN, Cr, TNF- α and ATN score of I/R+CD133+renal cell group were lower than those of the I/R+MSCs group, while the HGF level was higher ($P<0.05$). **Conclusion** Exogenous bone marrow MSCs and CD133+renal cells may regulate cytokine secretion and improve microenvironment in renal injury by endocrinic approach, which helps the recovery of acute renal injury, and the CD133+renal cells may be more effective than MSCs.

Keywords: Mesenchymal stem cell; CD133+renal cell; Kidney; Ischemia/reperfusion injury

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PubMed

收稿日期 2013-03-01 修回日期 网络版发布日期

DOI:

基金项目:

国家自然科学基金 (30840079)

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