

基础医学

外源hTERT基因转染对老年大鼠供肝缺血再灌注损伤的防护作用

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摘要:

目的 研究老年大鼠与成年大鼠肝脏缺血再灌注损伤的程度; 在肝移植前将外源端粒酶逆转录酶(TERT)基因导入老年大鼠供肝内, 移植成功后观察该基因对老年大鼠供肝缺血再灌注损伤的影响。方法 Wistar大鼠共分为2组: I组为成年大鼠(5个月), II组为老年大鼠(16~18个月)。移植成功后, 检测ALT、维生素C和维生素E含量, 超氧化物歧化酶(SOD)、过氧化氢酶(CAT)及丙二醛(MDA)含量, 比较两组缺血再灌注损伤程度; 另取老年大鼠分3组: A组(基因干预组), 将腺病毒介导的外源hTERT基因(rAdTERT)导入老年供肝; B组(空载体病毒组); C组(生理盐水组)。干预后不同时间检测各项指标来分析外源hTERT基因对减轻老年大鼠肝移植模型供肝缺血再灌注损伤的作用。结果 老年组大鼠的维生素C、维生素E、SOD、CAT的含量低于成年组大鼠($P < 0.05$); 老年组大鼠MDA和ALT含量高于成年组大鼠($P < 0.05$)。与空载体病毒组和生理盐水组相比, hTERT基因干预组的凋亡指数明显降低, ALT明显降低($P < 0.05$), 端粒酶活性明显提高, 且基因干预组肝组织仅存在轻度的细胞损伤。结论 老年大鼠肝脏的缺血再灌注损伤较成年大鼠重; 导入外源hTERT基因能减轻老年大鼠供肝缺血再灌注损伤。

关键词: hTERT基因; 缺血再灌注损伤; 肝移植; 老年大鼠

Protection against ischemia reperfusion injury in aged liver donor by induction of exogenous hTERT gene

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Abstract:

Objective To investigate the liver ischemia reperfusion (I/R) injury of adult and aged rats. Exogenous human telomerase reverse transcriptase (hTERT) gene was transferred into aged rats' liver before liver transplantation, and then the effects of the gene on cell apoptosis caused by I/R injury were observed. Methods Wistar rats were divided into two groups, with adult rats (5 months) in group I and aged rats (16~18 months) in group II. After transplantation, ALT content, chronic oxidative stress, lipid peroxidation related indicators including vitamin C and vitamin E, the content of superoxide dismutase (SOD), catalase (CAT) and malondialdehyde (MDA) were tested. The aged rats were divided into 3 groups: group A were pretreated with exogenous hTERT gene, group B with adenovirus vector and group C with physiologic saline. The indicators were detected to analyze the effects of exogenous hTERT gene on I/R injury. Results Contents of vitamin C, vitamin E, SOD, CAT were lower in group II than in group I ($P < 0.05$); MDA and ALT were higher in group II than in group I ($P < 0.05$). The apoptotic index and ALT level were significantly lower in group A than in group B and C ($P < 0.05$), while telomerase activity was increased and histological injury was milder in group A.

Conclusion Compared with that in the adult rats, the I/R injury in aged liver donors were severer. Exogenous hTERT gene induction offers protection against I/R injury in aged liver.

Keywords: hTERT gene; Ischemia reperfusion injury; Liver transplantation; Aged rat

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