



人羊膜负载人羊膜间充质干细胞对SD大鼠皮肤创面愈合的影响

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Effect of the Human Amniotic Membrane Loaded with Human Amniotic Mesenchymal Stem Cells on the Skin Wounds of SD Rats

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摘要

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摘要 目的 观察人羊膜 (HAM) 负载人羊膜间充质干细胞 (hAMSCs) 对SD大鼠皮肤创面愈合的影响。方法 采用胰酶消化HAM的上皮细胞, 将hAMSCs接种于HAM上培养, 然后贴覆于大鼠创面, 观察创面大体变化, 采用HE染色和免疫组织化学染色法检测创面愈合情况, 并与单纯羊膜组 and 对照组进行比较。结果 HAM负载hAMSCs组大鼠创面的平均愈合时间为(18.3±0.9)d, 明显快于对照组的(26.4±0.7)d ($P<0.01$) 和单纯羊膜组的(21.5±1.2)d ($P<0.05$); 术后11 d和14 d, HAM负载hAMSCs组大鼠的创面愈合率分别为(81.5±7.2)%和(94.3±3.6)%, 明显高于对照组的(48.5±3.2)%和(74.3±4.3)%及单纯羊膜组的(68.5±4.5)%和(86.8±4.8)% (P 均 <0.01)。皮肤切片HE染色结果证实, HAM负载hAMSCs组大鼠的伤口愈合质量明显优于单纯羊膜组和对照组。免疫组织化学染色结果显示, 术后14 d, HAM负载hAMSCs组大鼠皮肤CK19阳性表皮干细胞数为48.2±3.2, 明显高于单纯羊膜组的37.7±3.1 ($P<0.05$) 和对照组的29.6±2.4 ($P<0.01$); 血管内皮生长因子阳性颗粒表达数为64.5±4.5, 也明显高于单纯羊膜组的52.6±3.8 ($P<0.05$) 和对照组的40.7±3.1 ($P<0.01$)。结论 HAM负载hAMSCs可能是通过促进表皮干细胞和毛细血管再生, 促进皮肤损伤修复。

关键词: 人羊膜 人羊膜间充质干细胞 创伤修复 角蛋白19 血管内皮生长因子

Abstract: Objective To observe the effect of the human amniotic membrane (HAM) loaded with human amniotic mesenchymal stem cells (hAMSCs) on the skin wounds of SD rats. Methods The amniotic epithelial cells were removed by trypsin digestion. hAMSCs were loaded onto HAM and then covered on rat skin defects. The wound healing was observed by HE staining and immunohistochemistry, and the results were compared with the amniotic membrane group and blank control group. Results The average wound healing time was (18.3±0.9) d in the HAM load with hAMSCs group, which was significantly faster than those in the blank control group [(26.4±0.7) d, $P<0.01$] and the amniotic membrane group. After 11 d and 14 d, the wound healing rates in the HAM load with hAMSCs group were (81.5±7.2)% and (94.3±3.6)%, respectively, which were significantly higher than those in the blank control group [(48.5±3.2)% and (74.3±4.3)%] and the amniotic membrane group [(68.5±4.5)% and (86.8±4.8)%] (all $P<0.01$). Skin biopsy/HE staining confirmed that the quality of wound healing in the HAM load with hAMSCs group was significantly better than in the amniotic membrane group and the blank control group. Immunohistochemical staining showed that the number of CK19-positive epidermal stem cells in the HAM load with hAMSCs group (48.2±3.2) was significantly larger than those in the amniotic membrane group (37.7±3.1) ($P<0.05$) and the blank control group (29.6±2.4) ($P<0.01$). Furthermore, the vascular endothelial growth factor expression (64.5±4.5) in the HAM load with hAMSCs group was also significantly higher than those in the amniotic membrane group (52.6±3.8) ($P<0.05$) and the blank control group (40.7±3.1) ($P<0.01$). Conclusion HAM loaded with hAMSCs may promote the repair of skin wounds by promoting the regeneration of epidermal stem cells and capillaries.

Keywords: human amniotic membrane human amniotic mesenchymal stem cells wound healing cyokeratin19 vascular endothelial growth factor

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