

论著

联合应用粒细胞集落刺激因子和骨髓基质干细胞治疗急性心肌缺血的实验研究

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摘要 目的: 探讨粒细胞集落刺激因子和自体骨髓基质干细胞移植共同应用对心肌缺血的治疗作用。

方法: 采用自体骨髓基质干细胞(MSCs)在体外培养扩增。在结扎冠状动脉造成急性心肌缺血后,把被5溴-2脱氧尿苷(BrdU)标记后的MSCs移植到自体的缺血心肌中,同时腹腔注射粒细胞集落刺激因子5 d。4周后通过激光共聚焦显微镜验证移植后的MSCs是否向心肌细胞分化,通过心脏彩超和多导生理记录仪测定缺血心肌在移植自体MSCs后是否能提高心功能。另外,用Masson氏3色染色法从左室中断面切片量化心肌梗死范围。

结果: 移植4周后, MSCs向肌细胞分化,表达出 α -横纹肌肌动蛋白(α -sarcomeric actin)和存在于心肌闰盘中的connexin 43, 粒细胞集落刺激因子和自体骨髓基质干细胞移植结合应用的治疗组,左心室收缩功能明显强于单独应用自体骨髓基质干细胞移植的治疗组,移植后心肌左室收缩功能明显强于对照组,并且心肌梗死范围最小。

结论: MSCs移植后可以向心肌细胞分化,粒细胞集落刺激因子可以动员机体内自体MSCs到心肌缺血区域,两者共同应用对于缺血心肌有协同治疗作用。

关键词 [粒细胞集落刺激因子](#) [骨髓基质干细胞移植](#) [心肌缺血](#)

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Preliminary investigation on combining autologous marrow stromal cells transplantation with granulocyte colony stimulating factor for improvement of rabbit cardiac performance after acute myocardial infarction

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Abstract

AIM: To test the hypothesis that autologous marrow stromal cells (MSCs) transplantation combined with granulocyte colony stimulating factor (G-CSF) can enhance cardiac function of ischemic hearts in vivo.
METHODS: In order to achieve a safe and persistent effect, we explored the potential of autologous MSCs transplantation. Acute myocardial infarction induced by occlusion of left anterior descending artery, autologous MSCs labeled with BrdU bromodeoxyuridine in vitro were administered intramyocardially into the infarct area of the same donor rabbits and G-CSF was administered by subcutaneous injection. Four weeks later, the transplanted labeled MSCs were detected by laser scanning confocal microscopy and the cardiac functions were examined by echocardiogram and multichannel physiologic recorder. Myocardial infarct size was measured from mid-transverse sections stained with Masson's trichrome.
RESULTS: After 4 weeks, transplanted MSCs were demonstrated myogenic differentiation with the expression of α -sarcomeric actin and connexin 43 located in intercalated disk. MSCs combined with G-CSF transplantation improved the left ventricular contractility and reduced myocardial infarct size markedly compared to that without G-CSF treatment.
CONCLUSION: Our finding indicates that autologous MSCs combined with G-CSF transplantation may represent a promising therapeutic strategy on ischemic heart disease.

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