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MRI活体监测菲立磁标记大鼠骨髓间充质干细胞经动脉移植后的肝、脾分布

MRI monitoring the distribution of systematic engrafted marrow mesenchymal stem cells labeled with Feridex in the liver and spleen in vivo

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英文关键词：Mesenchymal stem cells Magnetic resonance imaging Carotid artery, common Cell transplantation Liver Spleen

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中文摘要:

目的 探讨菲立磁(Feridex)标记大鼠骨髓间充质干细胞(MSCs)经颈总动脉移植后MRI上肝、脾内的分布情况。方法 30只全脑缺血损伤模型大鼠进入研究,随机平均分为:标记组及未标记组;均经颈总动脉移植MSCs。标记组MSCs以硫酸鱼精蛋白为载体进行Feridex标记,标记后行可行性及安全性检测。移植后对两组进行MR检查,测量肝、脾与肌肉的信号强度比,并取病理标本行普鲁士蓝染色。结果 MSCs的Feridex标记率达100%,标记与未标记MSCs的台盼蓝拒染率、MTT染色间差异无统计学意义($F=0.27\sim2.06$,$P>0.05$;$F=0.025\sim0.322$,$P>0.05$)。标记组MSCs大鼠FFE T1WI上肝脾信号减低,移植后第3 d,标记与未标记组肝脏信号差异无统计学意义($F=4.72$,$P>0.05$)。移植后第7 d时,标记与未标记组脾脏信号差异无统计学意义($F=3.89$,$P>0.05$)。普鲁士蓝染色示标记组肝、脾内可见较多蓝染铁颗粒,随时间逐渐减少。结论 菲立磁标记大鼠MSCs安全有效,经颈总动脉移植后标记MSCs较多分布于肝、脾内。

英文摘要:

Objective To observe the distribution of the marrow mesenchymal stem cells (MSCs) labeled with Feridex in the liver and spleen after transplantation via common carotid artery with MR imaging. **Methods** MSCs of SD rats were labeled with Feridex using Protamine as transfection agent. The feasibility and safety of MSCs labeling were assessed. Thirty rats with global cerebral ischemia were randomly selected to be transplanted with 5×10^6 labeled MSCs (labeled group) or unlabled MSCs (unlabeled group) via common carotid artery equally. After transplantation serial MR imaging of the liver and spleen were performed to measure signal intensity ratio of liver and spleen to muscle. The liver and spleen tissues were sampled for Prussian blue staining. **Results** The labeling efficiency of MSCs with Feridex was about 100%. There was no statistical difference of Trypan blue exclusion rate and the optical absorption value in the MTT proliferation test between labeled cells and unlabeled cells within 7 d ($F=0.27$-2.06, $P>0.05$; $F=0.025$-0.322, $P>0.05$). Signal intensity on FFE T1WI of the liver and spleen of labeled group decreased. No statistical difference of liver signal intensity ratio was found between the two groups at 3rd day ($F=4.72$, $P>0.05$), nor of spleen signal intensity ratio at 7th day ($F=3.89$, $P>0.05$). The liver and spleen of labeled group had numerous Prussian blue staining positive particles, but gradually decreased as time went by. **Conclusion** Labeling MSCs with Feridex and Protamine is efficient and safe. A large quantity of labeled MSCs distribute in the liver and spleen during transplantation via common carotid artery majority.

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