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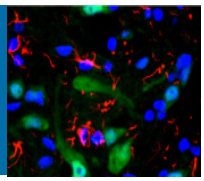

NSCs transplantation improves locomotor function in spinal cord transection rats associated with the expressional modulation of CNTFR

Qi-Qin Dan[1], Qing-Jie Xia [*]

Translational Neuroscience Center, West China Hospital, Sichuan University, Chengdu 610041, China

[Abstract] Objective/Aim: To explore the effect of NSC transplantation on functional recovery and the expression changes of CNTF receptor (CNTFR) in spinal cord transection (SCT) rats. **Methods:** Adult SD rats were divided into sham group, SCT+medium group and SCT+NSCs group. NSCs was injected into the spinal cord of rats in SCT+NSCs group after the establishment of SCT model. The assessment of locomotor was conducted at 7 and 14 days post operation (dpo) after injury, and animals were sacrificed at 1, 3, 7 and 14 dpo for collecting tissues from rostral and caudal cord segment closed to transection, which were used to detect the expression of CNTFR by western blotting and qRT-PCR. Meanwhile, the distribution of CNTFR in the spinal cord was investigated. **Results:** The locomotor function was significantly impaired after SCT injury, while it was improved by NSC transplantation. Q-PCR showed that CNTFR was significantly increased in the caudal cord segment closed to transection, compared with sham group. Moreover, after NSCs transplantation, the CNTFR was decreased in the spinal cord caudal segment closed to the transected site. Western blotting showed that the level of CNTFR in the rostral and caudal cord segment closed to transection was consistent with Q-PCR. By immunohistochemistry, the localization of CNTFR was found in neurons with the positive products in cytoplasm but not in the nucleus. **Conclusion:** SCT injury induces hind limb paralysis, whereas NSCs transplantation promotes the recovery of neural behavior. The underlying mechanism may be associated with modulating the expression of CNTFR. These findings may contribute to the explanation of molecular mechanism for the treatment of spinal cord injury after NSC administrition.

[Key words]: Spinal Cord Transection; Ciliary Neurotrophic Factor Receptor; Neural Stem Cells

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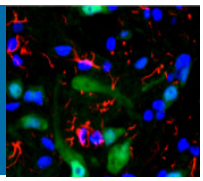

NSCs 移植通过调节 CNTFR 表达改善脊髓横断大鼠的运动功能

但齐琴[1]，夏庆杰*

四川大学华西医院转化神经科学中心，成都 610041

［摘要］目的：探讨NSC 移植对脊髓横断大鼠运动功能恢复的影响和脊髓横断（SCT）大鼠中CNTF 受体（CNTFR）的变化。**方法：**将成年 SD 大鼠分为假手术组、SCT+ 培养基组和 SCT+NSCs 组。在建立 SCT 模型后，将 NSCs 注入大鼠的脊髓，在损伤后 7d 和 14d 进行运动能力评估，在术后 1d、3d、7d 和 14d 取材，收集横断的脊髓头部和脊髓尾部组织，用 Western blotting 和 qRT-PCR 方法检测 CNTFR 的表达研究 CNTFR 在脊髓中的分布。**结果：**SCT 损伤组运动功能明显受损，而 NSC 移植后则得到改善。q-PCR 结果显示：与假手术组相比，CNTFR 在横断的尾部脊髓段明显增加，而在 NSCs 移植后，CNTFR 在脊髓尾段与横断部位的 CNTFR 下降。免疫蛋白印迹结果显示，CNTFR 在脊髓头端和尾端断裂段的水平与 Q-PCR 结果一致。免疫组化发现 CNTFR 定位于神经元胞浆阳性，而非神经元细胞核阳性。**结论：**SCT 损伤诱发后肢瘫痪，而 NSCs 移植可促进运动神经行为恢复，其分子机制可能与调控 CNTFR 的表达有关。这些发现可能有助于解释 NSCs 治疗脊髓损伤的分子机制。

关键词：脊髓横断、睫状神经营养因子受体、神经干细胞