

## Stem cell transplantation in neuropathic pain

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The neuropathic pain is a disabling condition which occurs secondarily to injury of peripheral or central nervous system. To date, the neuronal basis are poorly understood and effective treatments with long lasting relief are not available. Stem cells represent a more innovative and interesting therapeutic approach for tissue damage restoration. This study evaluates the effect of intravenous administration of murine adult neuronal stem cells and the administration in the lateral cerebral ventricle of human mesenchymal stem cells in two animal models of peripheral mononeuropathy: the chronic constriction injury and the spared nerve injury of the sciatic nerve. Pain related behaviour evaluation, morphofunctional alterations and the stem cell localization in brain, spinal cord and sciatic nerve were studied using respectively behavioural tests and immunohistochemical techniques. Stem cells were able to reduce pain-like behaviours, such as mechanical allodynia and thermal hyperalgesia, and to decrease the activation of nociceptive neurons at central level. The stem cells injected intravenously homed in the injured nerve site, while when injected in the cerebral ventricle was localized near the injection site. These data suggest that the stem cells administered intravenously influence directly the damaged area, whereas the cells injected in the cerebral ventricle could modulate the central neuronal pathway, responsible of neuropathic pain. The administration of stem cells in neuropathic pain syndromes may be a more suitable therapy than "classical" drugs to decrease the unpleasant related symptoms.

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