

Neuroplasticity in Spinal Trauma: A Current Narrative Review of Treatments

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ABSTRACT

Neuroplasticity is a condition present from birth, being found in the central and peripheral nervous system, both physiologically and pathologically. Based on the findings, therapeutic and non-therapeutic attempts were tested in spinal cord trauma to recover locomotor function below the level of the injury. Depending on the classification of the injury, different levels of motor and sensory preservation can be expected, with possible total loss of these, as in the case of an ASIA A injury. The work defined and showed other forms of the term neuroplasticity, talk about some pathological and non-pathological conditions and, finally, to show neuroplasticity and some of its treatments in the spinal cord injury process. For the elaboration of this work, a review of the narrative literature from 2000 to 2020 of the PubMed platform and analysis of two books was carried out. Animal/human studies were included that addressed pathologies, forms of treatment for spinal cord trauma and qualis from B1 to A1. Articles prior to 2000 that addressed neuroplasticity only to understand molecular mechanisms and articles that were not in English were excluded. As a result, the main molecules and structures involved in the neuroplasticity process were found and, based on this knowledge, forms of treatment were developed to assist neuroplasticity and a possible functional recovery. We can mention the introduction of nanotechnology to optimize the treatment, as in the case of the use of albumin and PLGA nanoparticles, which represents an advance in which the treatment evolves from a systemic situation to a more localized one, reducing side effects and improving results for patients. It can be concluded that physiological barriers are already being overcome by the most recent forms of treatment and that soon new studies will be able to propose a form of treatment that can be protocolled for all patients.

Keywords: Neuroplasticity, Spinal cord injury, Regeneration, Nanomaterials, Stem cell, Pharmacology

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