Review of recently documented neuroprotective clinical and cellular treatments for spinal cord injury: an analysis of outcomes

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Abstract : Emergence of new neuroprotective treatments for spinal cord injury (SCI) in recent clinical studies is a matter of great scientific and public interest. Effect size and complication rates are of particular concern. In this study, a search was performed in the PubMed, Scopus, and Scholar Google search engines using the keywords "spinal cord injury", "cell transplantation", "neuroprotective", and "treatment". Clinical studies published in the English language were included. Using the study inclusion criteria, 45 clinically relevant studies were found in which neurologic changes was descriptively reported. Of these, 20 studies with thorough American Spinal Injury Association scale, and sensory and motor reports were included for quantitative review. Overall, these papers show an increment in the number of studies reported since the turn of the century, and recent endeavors in the field have accelerated. To compare newer and older studies, considering sufficient numbers of studies in each group, the year 2010 was identified as the turning point. The mean ± standard deviation change in motor score after treatment was 8.67±3.48 in reports before 2010, and this increased to 8.95±2.78 after 2010. Similarly, the mean change in score for light touch was 9.57±3.63 before 2010 and increased to 10.58±3.06 after 2010. The mean change in score for pinprick sensation improved from 8.36±2.82 before 2010 to 8.39±2.69 after 2010. Our study indicates that cellular and neuroprotective therapies are becoming more popular, and the mean neurologic effect size in terms of light touch shows an increment, paving the pathway for clinical applications to be established in the near future.

Keywords : spinal cord injury, cell transplantation, neuroprotective treatment