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Poster Presentation

Therapeutic Application of Mesenchymal Stem Cells in Spinal Cord Injury Treatment

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Abstract

Spinal cord injury (SCI) is a neurologic disorder that have a significant impact on quality of life, life expectancy, and economic burden. SCI leads to irreversible neuronal loss and ultimately leads to paralysis. Mesenchymal stem cells (MSCs) are a promising source for cellular therapy because they have possessed the capacity of self-renewal and differentiation to several distinct mesenchymal lineages. Mesenchymal stem cells can be derived from a diverse range of tissues but bone marrow, umbilical cord blood, adipose tissue and peripheral blood are the major sources of MSCs. MSCs can reduce inflammatory responses, and cell death following the mechanical trauma. Mesenchymal stem cells are suitable for reducing and minimizing many pathophysiological consequences of SCI. When MSCs are injected at injury site, they secrete a variety of cytokines and growth factors, such as neurotrophic factors, insulin-like growth factor (IGF), vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF-2), and transforming growth factor (TGF). In addition, MSCs increase serum interleukin IL-10 and decrease tumor necrosis factor (TNF). T cells change from pro-inflammatory Th1 cells to anti-inflammatory Th2 cells in the presence of MSCs. Nowadays MSC is novel therapeutic approach in the treatment of spinal cord injury. This promising approach to the treatment of SCI in its nascent stages is facing several challenges. However, further research is needed to better understand of the mechanism of action and the behavior of stem cells in lesion after transplantation to determine the most effective pathway and the best time frame for post-traumatic application.

Keywords: Spinal Cord Injury, Mesenchymal Stem Cells

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