

Improvement of the spinal contusion model by co-transplanting bone marrow stromal cells and induction into oligodendrocytes-like cells.

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Introduction: Demyelination is a common lesion of spinal cord injury; cell therapy is an approach for replacing the lost oligodendrocytes.

Objective: In this study, bone marrow stromal cells (BMSCs) have been transdifferentiated into oligodendrocyte-like cells (OLCs) and used in cytotherapy of contused spinal cords in rats.

Materials and Methods: The BMSCs were collected from rat long bones, cultured and characterized by different markers, then pre-induced with dimethyl sulfoxide followed by retinoic acid. Then, the pre-induced cells were induced with a combination of basic fibroblast growth factor (bFGF), platelet derived growth factor (PDGF), and heregulin (HRG) followed by triiodothyronine (T3). The OLCs were transplanted in the contused spinal cords of the rats combined with undifferentiated BMSCs. Specific markers were used to characterize the cells by immunohistochemistry and RT-PCR.

Results: The BMSCs showed typical immunoreactivity to the markers and the OLCs were immunostained with specific markers. There was an improvement in BBB test with reduction in the cavitation in the contused rats treated with OLCs combined with BMSCs.

Conclusion: The transplanted cells were detected in the contused spinal cord. The combination of the transdifferentiated BMSCs into OLCs with the undifferentiated BMSCs improved the contused spinal cord.

Keywords: spinal contusion model, bone marrow, stromal cells, oligodendrocytes-like cells
