

Therapeutic effects of human mesenchymal stem cells with methylprednisolone treatment in rat spinal cord injury

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Methylprednisolone (MP), a glucocorticoid steroid, has an anti-inflammatory action and seems to inhibit the formation of oxygen free radicals produced during lipid peroxidation in a spinal cord injury (SCI). Currently MP is the standard therapy after acute SCI on reported neurological improvements. The combination therapeutic effect of human umbilical cord blood-derived mesenchymal stem cells (hUCB-MSCs) for transplantation time (1d, 7d, and 30d) after MP treatment on the axonal regeneration and on the behavioral improvement in SCI were studied in the rat. The spinal cord was injured by contusion using a weight-drop at the level of T9 and MP (30 mg/kg, i.m., 10 min and 4 h) was acutely administered after injury. hUCB-MSCs were labeled with GFP and our study performed the efficacy for transplantation time (1d, 7d, and 30 d) of hUCB-MSCs into the boundary zone of injured site. Efficacy was determined by histology, anterograde and retrograde tracing, and behavioral test. We found that hUCB-MSCs with MP treatment exerted a significant beneficial effect by neuroprotection and reducing cavity volume. Also the transplantation of hUCB-MSCs with MP treatment significantly

improved functional recovery. Combined transplantation at 7d after SCI provided significantly greater efficiency than combined transplantation at 1d and 30d. These results suggest that transplantation time window of the hUCB-MSCs with MP treatment give rise to an earlier neuron protection strategy and effect of cell grafting in SCI. Thus our study may be considered as a therapeutic modality for SCI.

Biography

Lee So Maeng graduated from the College of Medicine, The Ewha Women's University as Medical Doctor with specialties in pathology from the The Catholic University of Korea (CUK), Republic of South Korea. She obtained her Postgraduation from the same university and worked on the topic entitled "Sequential changes in aberrant crypt foci and lectin expression in the early and late stages of DMH-induced colon carcinogenesis in rats". She is presently working at the Clinical Research Institute of the Incheon St. Mary's Hospital at the College of Medicine (CUK).

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