

BLADDER FUNCTIONS RECOVERY IN TRAUMATIC SPINAL CORD INJURY AFTER TRANSPLANTATION OF NEURONAL-GLIAL RESTRICTED PRECURSORS OR BONE MARROW STROMAL CELLS

Hypothesis / aims of study

This study aims to investigate the functional recovery of lower urinary system of the rats with spinal cord injury (SCI) following transplantation of Neuronal Restricted Precursors (NRP) / Glial Restricted Precursors (GRP) or Neural cells derived from bone marrow stromal cells (nBMSC) into the injured area of spinal cord.

Study design, materials and methods

A total of 30 rats were experimented in 4 groups. Group 1 (Sham operation) (n:5), Group 2 (SCI + transplantation of NRP / GRP) (n:10), Group 3 (SCI + transplantation of nBMSC) (n:10), Group 4 (SCI control group) (n:5). Urodynamics were performed on the rats of Group 2 and Group 3 without sedation on day 28 after transplantation. All rats in four groups were then sacrificed in day 28 after transplantation and the cells transplanted into the injured spinal cord underwent histological investigation.

Results

The cells those were transplanted (NRP, GRP, nBMSC) were found viable in the injured area of spinal cord. Baseline pressure, maximum capacity, mean uninhibited contraction amplitude, mean voiding pressure, voiding volume, residual volume, were significantly better in Group 2 and 3 than in Group 4 ($p < 0.05$). Meanwhile the baseline pressure in Group 2 was better than in Group 3 ($p < 0.05$). We didn't find significant difference between groups according to mean uninhibited contraction frequency ($p > 0.05$).

Interpretation of results

Although the NRP / GRP transplanted rats seems more, but all rats in groups 2 and 3 showed some significant improvement in their lower urinary system functions.

Concluding message

NRP/GRP and nBMSC transplanted to injured spinal cord can live for at least 4 weeks. Improvements to some extent in lower urinary system functions have been observed in both treatment groups though it was slightly better in NRP/GRP-transplanted rats. However, this improvement is far from full functional recovery. This study revealed the potential of NRP/GRP or nBMSC transplantation following experimental spinal cord injury.

Specify source of funding or grant	None
Is this a clinical trial?	No
What were the subjects in the study?	ANIMAL
Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	Yes
Name of ethics committee	Celal Bayar University, Animal Ethic Committee