The 2nd International Neurotrauma Congress &
the 4th International Roads Safety Congress

Shefa Neuroscience Research Center, Tehran, Iran, 18-20 February, 2015

The Neuroscience Journal of Shefaye Khatam

Volume 2, No. 4, Suppl. 3

Poster Presentation

The Use of Fluoro-Gold for Retrograde Tracing of Cell Injection after Spinal Cord Injury: Improves Axonal Growth after Transplantation of Cells

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***Published:* 18 February, 2015**

Abstract

Traffic accident has increased in the last decade. One of the most important outcomes of accident is spinal cord injury (SCI). So, cell therapy is obtained a greater attention in most fields of medicine because of its potential for incurable diseases through replacing of dead cells. The current study aims to describe the important of locomotor functional and structural connection of the spinal cord pathway innervating the sciatic nerve after SCI following transplantation of GDNF-transfected adipose derived stem cells. The isolated adipose stromal cells were cultured and then mesenchymal stem cell markers were evaluated by RT-PCR and immunocytochemistry assays. Third passage cells were used for ex vivo gene delivery. ADSCs were transfect by vector pLVPT-GDNF-trTR-KRAB-2SM2. Then the transfected cell transplant to contusion model of rat SCI that administrate valproic acid in acute phase. Rats were divided into three groups: (1) laminectomy (without SCI) only; (2) laminectomy+SCI+VPA (300 g/kg and 12h post injury); (3) SCI+ADSCs-TR infused 7 days post injury+VPA(300 g/kg and 12h post injury). Contusion injury was performed with a New York University (NYU) weight-drop device. Locomotors function was assessed by the H-reflex and Basso-Beattie-Bresnahan (BBB) test for 12 weeks. The retrograde fluorogold tracing method used for fate of injected ADSCs-TR. Spinal cord was examined histologically, and assessed in order to position of cell replacement three month after surgery. BBB test scores of SCI rats treated with ADSCs-TR at 7 days+VPA (300 g/kg and 12h post injury) were significantly improved as compared to scores of rats similarly injured (P<0.05). The H/M ratio decreased following the treated with ADSCs-TR (P<0.05). Fluorogold tracing method revealed that transplanted ADSCs-TR showed positive labeling after sciatic nerve injection. Thus, our results demonstrate that genetic engineering of adipose MSC was effective in promoting axonal outgrowth but could also lead to enhanced recovery after injury.

Keywords: Spinal Cord Injury, Valproic Acid, Mesenchymal Stem Cell, Fluoro-Gold.

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