

Effects of the application of mesenchymal stem cells on movement and urination of rats subjected to spinal cord injury

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Abstract

Cell therapy has been reported as a possible treatment for spinal trauma in people and animals, and it does not exhibit pharmacological cure for damages arising out of the primary lesion.

In this study the effects of the application of human adipose derived stem cells (hADSC) in rats after spinal cord injury were evaluated. The hADSC were cultured, used between the third and fifth passages and part of them was transduced for screening in vivo after transplantation. Spinal cord injury was performed with a Fogarty catheter nº 3 inserted into the epidural space with cuff located at T8 and filled with 80 µL of saline for 5 minutes. The control group A (n=12) received culture medium (50 µL) and group B (n=12) received two applications hADSC (1.2×10^6), seven and 14 days post-injury, both in the tail vein. The bladder emptying by massage was performed daily for three months. Evaluation motors were repeated daily until three months post-injury using the Basso-Beattie-Bresneham scale. After this period the animals were euthanized and histological analysis of urinary bladder and spinal cord were performed.

The bioluminescence analysis revealed hADSC application site and lungs. There was an improvement of the function of the urinary bladder in 83.3% of the animals in group B and 16.66% of the animals in group A. The analysis of motor and histological evaluations of the spinal cords and urinary bladders did not demonstrate significant differences between groups A and B. The results indicated that transplanted hADSC beneficially influenced in urination through a mechanism of action at a distance called telecrine.

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