Gene Therapy Approaches in Spinal Cord Injury

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Conclusions and Discussion

Gene therapy offers a hopeful strategy to treat spinal cord injury. Previously, systemic administration of Neurotrophic factors used to produce secondary effects and toxicity, since high doses were required to get to the CNS. Later, cell transplants showed a promising potential, although engraftment and survival of transplanted cells is not 100% efficient. Hence, gene therapy offers a way to locally administer a therapeutic gene at a clinical doses so that the minimum toxicity is caused. However, viral vectors carry some risk associated. More efficient and less dangerous vehicles are required to pass from pre-clinical to clinical trials. A future approach would be combinational strategies, where genetically engineered cells could be obtained by ex vivo gene transfer and lately transplanted into the spinal cord. Biomaterials to serve as bridges between both parts of the glial scar are also being tested. Moreover, strategies where promoters could be induced to express or not the therapeutic gene would be of great clinical interest, and are already being tested.

To sum up, there is no one and only strategy that will cure SCI in short term, although great efforts are directed to find the combination that will be both efficient and safe enough for being tested in patients.

References