

5th International Conference on

Tissue Engineering & Regenerative Medicine

September 12-14, 2016 Berlin, Germany

Sciatic nerve regeneration induced by transplantation of *in vitro* bone marrow stromal cells into an inside-out artery graft in rat

Rahim Mohammadi
Urmia University, Iran

Traumatic injury to peripheral nerves results in considerable motor and sensory disability. Several research groups have tried to improve the regeneration of traumatized nerves by invention of favorable microsurgery. Effect of undifferentiated bone marrow stromal cells (BMSCs) combined with artery graft on peripheral nerve regeneration was studied using a rat sciatic nerve regeneration model. A 10-mm sciatic nerve defect was bridged using an artery graft (IOAG) filled with undifferentiated BMSCs (2×10^7 cells/mL). In control group, the graft was filled with phosphated buffer saline alone. The regenerated fibers were studied 4, 8 and 12 weeks after surgery. Assessment of nerve regeneration was based on behavioral, functional (Walking Track Analysis), electrophysiological, histomorphometric and immunohistochemical (Schwann cell detection by S-100 expression) criteria. The behavioral, functional and electrophysiological studies confirmed significant recovery of regenerated axons in IOAG/BMSC group ($P < 0.05$). Quantitative morphometric analyses of regenerated fibers showed the number and diameter of myelinated fibers in IOAG/BMSC group were significantly higher than in the control group ($P < 0.05$). This demonstrates the potential of using undifferentiated BMSCs combined with artery graft in peripheral nerve regeneration without limitations of donor-site morbidity associated with isolation of Schwann cells. It is also cost saving due to reduction in interval from tissue collection until cell injection, simplicity of laboratory procedures compared to differentiated BMSCs and may have clinical implications for the surgical management of patients after facial nerve transection.

Biography

Rahim Mohammadi has completed his DVSc at the age of 39 years from Urmia University. He is Assistant Professor of Surgery in Faculty of Veterinary Medicine, Urmia University, Urmia Iran. He has published more than 45 papers in reputed journals.

r.mohammadi@urmia.ac.ir

Notes: