Methods: A quantitative histological study was performed to determine ED-1 positive cells, glial cell density and cavitation size in untreated SCI rats at 1 day, 2 days, 4 days, 1 week, 2 weeks, 3 weeks and 4 weeks.

Results: Our results showed that glial cells were the largest population of cells (85.45%), whereas *ED-1immunoreactive cells* (monocyte/phagocyte marker in rats) were low (23.15%). Moreover, they infiltrate the injured spinal cord as early as 2 days after the injury.

Conclusions: These findings indicate that multiphase response is observed in contusive SCI. These finding could provide insights into the development of important strategies for treating SCI.

Keywords: Spinal cord injury; Inflammation; ED-1 positive cells; microglia; macrophage

Trans-differentiation of the Adipose Tissue-Derived Stem Cells into Neuron-Like Cells Expressing Neurotrophins by Selegiline

Alireza Abdanipour, Taki Tiraihi, AliReza Delshad

***Alireza Abdanipour**, *Department of Anatomical Sciences, School of Medical Sciences, Tarbiat Modares University, Tehran, Iran; Shefa Neurosciences Research Center, Khatam Al-Anbia Hospital, Tehran, Iran.*

Taki Tiraihi, Shefa Neurosciences Research Center, Khatam Al-Anbia Hospital, Tehran, Iran.

AliReza Delshad, *Dept of Anatomical Sciences, School of Medicine, Shahid University, Tehran, Iran.*

Introduction: Adult stem cells (ASC) are undifferentiated cells found throughout the body. These cells are promising tools for cell replacement therapy in neurodegenerative disease. Adipose tissue is the most abundant and accessible source of ASC. This study was conducted to evaluate effect of selegiline on differentiation of adiposederived stem cells (ADSC) into functional neuron-like cells (NLC), and also level of the neurotrophin expression in differentiated cells.

Methods: ADSC were transdifferentiated into NLC using selegiline where CD90, CD49d, CD31, CD106 and CD45 were used as markers for ADSC identification. Lipogenic and osteogenic differentiation of ADSC were used to characterize the ADSC. ADSC were treated with selegiline at different concentrations (from 10-6 to 10-11 mM) and time points (3, 6, 12, 24 and 48 h). Percentage of viable cells, nestin and neurofilament 68 (NF-68) immunoreactive cells were used as markers for differentiation. The optimal dose for neurotrophin expressions in differentiating cells was evaluated using reverse transcriptase-PCR. NLC function was evaluated by loading and unloading with FM1-43 dye.

Results: ADSC were immunoreactive to CD90 (95.67 ± 2.26), CD49d (71.52 ± 6.64) and CD31 (0.6 ± 0.86), but no immunoreactivity was detected for CD106 and CD45. The results of neural differentiation showed the highest percentage of nestin and NF-68 positive cells at 10-9 mM concentration of selegiline (exposed for 24 h). The differentiated cells expressed synapsin and neurotrophin genes except brainderived neurotrophic factor.

Conclusion: ADSC can be an alternative source in cell-based therapy for neurodegenerative diseases using selegiline to induce ADSC differentiation to neuronal lineage.

Keywords: Selegiline, Neurotrophin, Transdifferentiation