The 6th International Epilepsy Symposium
Shefa Neuroscience Research Center, Tehran, Iran, 24-26 August, 2018
The Neuroscience Journal of Shefaye Khatam
Volume 6, No. 3, Suppl 2

Oral Presentation

Differentiation of Human Neural Stem-Like Cells Derived from Epileptic Amygdala Tissue into Motor Neurons

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Published: *24 August, 2018*

Abstract

Animal studies have increasingly shown that the potential for the stem cells to use in the treatment of motor neuron diseases, such as amyotrophic lateral sclerosis and spinal muscular atrophy. This might be achieved by using stem cells to replace cells, deliver nourishing substances or dampen down inflammation. The aims of the present study were to isolate and characterize the neural stem cells from human epileptic amygdala tissues and differentiate them to the motor neurons. Samples were collected from epileptic patients undergoing brain surgery. The tissue was dissociated enzymatically. Then, the single cells were cultured in neurosphere medium, including DMEM/F12 containing growth factors and supplements in non-coated flasks. For motor neuron-like cell induction, neural stem cells were exposed with DMED/F12 containing supplements, Sonic hedgehog, retinoic acid, brain-derived neurotrophic factor and glial-derived neurotrophic factor for two weeks. To characterize the isolated cells, immunocytochemistry was performed against nestin, Sox2, GFAP and MAP2 for neural stem cells and ChAT for evaluating the motor neuron-like cells. Primary neurospheres were appeared after 4-7 days. The number of spheres enhanced after each passage. Isolated cells expressed neural stem cell markers, nestin and sox2. The differentiated cells had positive immunoreactivity to motor neuron marker. The human amygdala tissue obtained from epileptic patients can be considered as a valuable source of adult neural stem cells for future investigations.

Keywords: Amygdala, Temporal Lobe Epilepsy, Neurosphere, Motor Neuron.

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