

Bone marrow derived mesenchymal stem cells transplantation as a potential therapy for experimental epilepsy

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Epilepsy affects 0.5-1% of the world's population, relatively large proportion of patients with temporal lobe epilepsy (TLE) are resistant to antiepileptic drugs or experience debilitating side effects from long-term treatment such as cognitive impairment, depression, or dementia. Novel approaches based on stem cell therapy offer the potential for curing epilepsy, rather than treating the symptoms. Given their ability to proliferate, differentiate and regenerate tissues, bone marrow derived mesenchymal stem cells (BMSCs) could restore neural circuits lost during the course of the disease and reestablish the physiological excitability of neurons. To verify the therapeutic potential of (BMSCs) transplanted either intravenously (IV) or intracranially (IC) on experimentally induced temporal lobe epilepsy in rats. TLE was induced by a single dose of pilocarpine nitrate injected intraperitoneally. Rats were divided into four groups: 1) control gp, 2) epileptic gp, 3) IV injected BMSCs gp and 4) IC injected BMSCs gp. Oxidative stress, proinflammatory cytokines, neurotransmitters immunohistochemical assay for Insulin growth factor receptor-1, synaptophysin and caspase-3 and histopathological investigation were assessed. BMCs effectively decreased lipid peroxides, TNF- α , IL-1 β and glutamate level in both cortex and hippocampus, also a significant decrease in the level of each of IGF-1R, Synaptophysin and caspase -3 was regarded in BMCs-treated rats. Moreover histopathological examination illustrated mature neural cells with prominent granules. However, IC transplantation showed to be more effective than IV transplantation. Our data demonstrate that BMCs transplantation has potent therapeutic effects and could be a potential therapy for clinically intractable epilepsies.

Biography

Neveen A. Salem has completed her Ph.D. at the age of 31 years from Faculty of pharmacy Cairo University and postdoctoral studies from National Research Centre. She is now a researcher in National Research Centre, Egypt. She had published more than 13 papers in reputed journals and is currently the Principle Investigator of a project about the therapeutic effect of mesenchymal stem cell derived from bone marrow and adipose tissue on liver fibrosis.

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