Natureza do trabalho: Resumo

TÍTULO

THE USE OF STEM CELLS IN ALZHEIMER'S TREATMENT

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RESUMO

Introduction: Alzheimer's disease (AD) is the most common cause of dementia in individuals over 60 years. It is characterized by the presence in the brain of extracellular senile plaques. This change provides progressive neuronal degeneration and dysfunction, resulting in severe brain atrophy and cognitive deficits. The neurodegeneration occurs in the dentate gyrus and CA1 subregion of the hippocampus, entorhinal cortex and association neocortex. Through the discovery that constitutive neurogenesis persists in the adult mammalian brain, including brain regions affected by AD, the hypothesis that the disease could be overcome or ameliorated is born. The adult neurogenesis process involves the proliferation of resident stem cells and neural progenitor cells and their migration, differentiation into mature neurons and functional integration into the neural network. There are two areas of the brain of adult mammals (rodents, monkeys and humans) in which neurogenesis occurs: subgranular zone of the dentate gyrus of the hippocampus and the subventricular zone of the lateral ventricles. **Objective:** This study aims at the treatment of AD from neural, mesenchymal stem derived from adipose tissue stem cells and induced pluripotent stem cells. **Materials and Methods:** Systematic review of current scientific literature from the PubMed and Scielo database. **Discussion and Conclusion:** The stem cells include embryonic stem cells (ESC), induced pluripotent stem cells (iPSCs), stem cells derived from tissue such as bone marrow (BM), and stem cells derived from adipose tissue. Stem cells derived from neuron have the potential to integrate neural networks of the brain. The cell transplantation appear to increase levels of acetylcholine to improve memory and cognition in animal model. In addition, the stem cells secrete neurotrophic factors to modulate neuroplasticity and neurogenesis. Adipose-derived stem cells (ADSCs) were induced to differentiate into astrocytes or neurons and their transplant was successful, causing enhancement of neuronal function. Another study which were also transplanted ADSCs in the hippocampus of transgenic mice for AD, it was concluded that the transplantation of mesenchymal stem cells could stimulate neurogenesis in the brain of adult rodents, as these cells secrete growth factors enhancing cell proliferation in the subgranular zone of the dentate gyrus. This facilitates the differentiation of new cells in the subventricular zone, causing to facilitate functional recovery in mice by neurogenesis. When ADSCs were administered intravenously in mice models, such cells were found in the brain within twelve days after injection. A new study made use of isolated human cells of patients with AD. These cells were then used to model the disease offering an insight into its abnormal function compared with non-diseased cells and also how they may be vulnerable to environmental factors. The stem cell therapy not only has the potential to replace damaged neurons but also has the capacity to generate new astrocytes. Studies confirm that treatment with stem cells can be effective and safe, especially through the advancement of new research.

Acknowlegments and References:

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