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Alzheimer's Disease and Stem Cell Therapies

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Abstract

Alzheimer's disease (AD) is a neurological illness that causes memory loss and cognitive impairment as it progresses. Synaptic failure and an excessive accumulation of misfolded proteins cause it. Almost all advanced clinical trials on specific AD-related pathways have failed to date, owing to the loss of a huge number of neurons in the brains of Alzheimer's patients. Furthermore, the pharmacological candidates that are currently accessible intervene too late. With the advancement of stem cell technology and the transformation of these cells into various types of central nervous system neurons and glial cells, stem cells have enhanced their self-renewal, proliferation, differentiation, and recombination features. In animal models of Alzheimer's disease, stem cell therapy has proven to be effective. Preclinical trials on stem cell therapy for Alzheimer's disease have shown promise. Human clinical studies using cell replacement therapies, such as human embryonic stem cells or induced pluripotent stem cell–derived neural cells, are currently underway to treat individuals with Alzheimer's disease. However, many more steps must be done before stem cell therapy may be used to treat human Alzheimer's disease and associated disorders in the clinic. This research examines the pathogenesis of Alzheimer's disease and the potential applications of associated stem cells based on cell type.

***Keywords:** Alzheimer's disease; Stem cell; Therapy; Pathogenesis; Animal experiment; Clinical trial*

Introduction

Alzheimer's disease can only be treated through stem cell therapy. Mesenchyme stem cells are injected into the body in a systemic approach. When ingested in big doses, these brain stem cells can both trigger and treat inflammation in the body. Stem cells can develop into brain cells, curing and restoring brain damage caused by neurological illnesses like dementia. Alzheimer's disease is the most common form of dementia and is an advanced neurological illness. Alzheimer's disease has so far eluded a permanent and effective cure. In recent

investigations, stem cell therapy has been identified as one of the most effective treatments for Alzheimer's patients. Brain-derived Neural Stem Cells (NSCs), Induced Pluripotent Stem Cells (IPSCs), and Embryonic Stem Cells are among the various stem cell therapies utilised to treat Alzheimer's disease (ESCs). Stem cell treatment, also known as regenerative medicine, uses stem cells and their derivatives to aid in the repair of sick, wounded, or malfunctioning tissue. It is the next step in organ transplantation, replacing donor organs with cells. Stem cells let the body make new cells and replace damaged or destroyed ones as it grows. They have two unique features that aid in the generation of new cells. They can divide and proliferate indefinitely to produce new cells. They convert into other specialised cells as they divide, replacing damaged cells.

Therapies in Alzheimer's disease

Stem cells come in a variety of forms and can be employed for a variety of purposes. Pluripotent Stem Cells That Have Been Induced (IPSCs). Adult stem cells and embryonic stem cells are both non-embryonic stem cells. Embryonic stem cells, cord blood stem cells, and amniotic fluid stem cells are all derived from three to five-day-old human embryos. Allogeneic and autologous stem cell transplants are the two most common types of stem cell transplants. The stem cells for an allogeneic transplant are acquired from a different person. In an autologous transplant, stem cells are taken from the patient's blood and then reintroduced after treatment to rid the body of malignant cells. Blood disease treatment, cell deficiency therapy, brain illness treatment, cardiovascular disease treatment, and tissue regeneration are all common uses for stem cells. The most common application of stem cells is tissue rejuvenation. Neural stem cells, which are responsible for the generation of all nerve cell types during development, are one of the cell type classifications of stem cells. They are pluripotent cells that may self-renew and create astrocytes, oligodendrocytes, or neurons. Reduced plaque burden by internalisation and destruction of endosomal–lysosomal pathway oligomers, immunological modulation, and neurotrophic or regenerative potential are three key functions of mesenchymal stem cells in Alzheimer's disease treatment. In vitro, embryonic stem cells can develop into NPCs, which can then be used as treatments in animal models of Alzheimer's disease. Induced pluripotent stem cells (IPSCs) have shown early efficacy in regulating endogenous neurogenesis, replacing lost neurons, and reversing pathological alterations. As a result, stem cells are currently mostly used to treat Alzheimer's disease.

REFERENCES

1.) Berth SH, lloyd TE. Secondary causes of myositis. Neurologic Manifestations of Systemic Disease 2020; 22: 01-15.
2.) Karunaratne K, Amiras D, Pickering MC, Hofer M, Viegas S, et al. Autoimmune necrotising myopathy and HMGCR antibodies. Practical Neurology 2018; 18:151-155.
3.) Allenbach Y, Mammen AL, Benveniste O.224th ENMC International Workshop: Clinico-sero-pathological classification of immune-mediated necrotizing myopathies Zandvoort, The Netherlands 14–16 October 2016. Neuromuscular Disorder 2018; 28: 87-99.