

A GUIDE FOR PATIENTS

LITERATURE

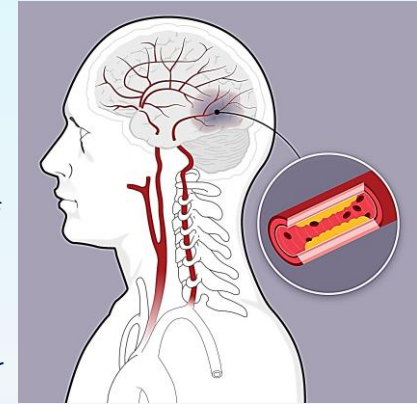
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literature page



❖ Stroke

➤ Intravenous administration of auto serum-expanded autologous mesenchymal stem cells in stroke

Transplantation of human mesenchymal stem cells has been shown to reduce infarct size and improve functional outcome in animal models of stroke. Here, we report a study designed to assess feasibility and safety of transplantation of autologous human mesenchymal stem cells expanded in autologous human serum in stroke patients. We report an unblinded study on 12 patients with ischaemic grey matter, white matter and mixed lesions, in contrast to a prior study on autologous mesenchymal stem cells expanded in foetal calf serum that focused on grey matter lesions. Cells cultured in human serum expanded more rapidly than in foetal calf serum, reducing cell preparation time and risk of transmissible disorders such as bovine spongiform encephalomyelitis.



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➤ Stem Cell Transplantation Therapy for Multifaceted Therapeutic Benefits after Stroke

One of the exciting advances in modern medicine and life science is cell-based neurovascular regeneration of damaged brain tissues and repair of neuronal structures.

The progress in stem cell biology and creation of adult induced pluripotent stem (iPS) cells has significantly improved basic and pre-clinical research in disease mechanisms and generated enthusiasm for potential applications in the treatment of central nervous system (CNS) diseases including stroke..

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➤ **Neuroinflammation as a target for treatment of stroke using mesenchymal stem cells and extracellular vesicles**

Ischemic stroke is the third cause of death in the developed countries and the main reason of severe disability. Brain ischemia leads to the production of damage-associated molecular patterns (DAMPs) by neurons and glial cells which results in astrocyte and microglia activation, pro-inflammatory cytokines and chemokines production, blood-brain barrier (BBB) disruption, infiltration of leukocytes from the peripheral blood into the infarcted area, and further exacerbation of tissue damage. However, some immune cells such as microglia or monocytes are capable to change their phenotype to anti-inflammatory, produce anti-inflammatory cytokines, and protect injured nervous tissue. In this situation, therapies, which will modulate the immune response after brain ischemia

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➤ Autologous Mesenchymal Stem Cells in Chronic Stroke

Cell transplantation is a 'hype and hope' in the current scenario. It is in the early stage of development with promises to restore function in chronic diseases. Mesenchymal stem cell (MSC) transplantation in stroke patients has shown significant improvement by reducing clinical and functional deficits. They are feasible and multipotent and have homing characteristics. This study evaluates the safety, feasibility and efficacy of autologous MSC transplantation in patients with chronic stroke using clinical scores and functional imaging (blood oxygen level-dependent and diffusion tensor imaging techniques).

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➤ A Long-Term Follow-Up Study of Intravenous Autologous Mesenchymal Stem Cell Transplantation in Patients With Ischemic Stroke

We previously evaluated the short-term follow-up preliminary data of mesenchymal stem cells (MSCs) transplantation in patients with ischemic stroke. The present study was conducted to evaluate the long-term safety and efficacy of i.v. MSCs transplantation in a larger population. To accomplish this, we performed an open-label, observer-blinded clinical trial of 85 patients with severe middle cerebral artery territory infarct. Patients were randomly allocated to one of two groups, those who received i.v. autologous ex vivo cultured MSCs (MSC group) or those who did not (control group), and followed for up to 5 years. Mortality of any cause, long-term side effects, and new-onset comorbidities were monitored. Of the 52 patients

who were finally included in this study, 16 were the MSC group and 36 were the control group

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➤ **Efficacy of stem cell-based therapies for stroke**

Stroke remains a prevalent disease with limited treatment options. Available treatments offer little in the way of enhancing neurogenesis and recovery. Because of the limitations of available treatments, new therapies for stroke are needed. Stem cell-based therapies for stroke offer promise because of their potential to provide neurorestorative benefits. Stem cell-based therapies aim to promote neurogenesis and replacement of lost neurons or protect surviving neurons in order to improve neurological recovery. The mechanism through which stem cell treatments mediate their therapeutic effect is largely dependent on the type of stem cell and route of administration.

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➤ **Stem cell therapy in stroke: a review literature**

Stroke is an important cause of death in the world and disability world-wide especially in developed countries. Following acute phase of stroke, some procedures and medical treatment such as thrombolytic agents has been recommended; nevertheless many patients have enduring deficits.

Thus, there is a realistic need to develop treatment strategies for reducing neurological deficits.

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➤ **Recent Advances in Cell-Based Therapies for Ischemic Stroke**

Stroke is the most prevalent cardiovascular disease worldwide, and is still one of the leading causes of death and disability. Stem cell-based therapy is actively being investigated as a new potential treatment for certain neurological disorders, including stroke. Various types of cells, including bone marrow mononuclear cells, bone marrow mesenchymal stem cells, dental pulp stem cells, neural stem cells, inducible pluripotent stem cells, and genetically modified stem cells have been found to improve neurological outcomes in animal models of stroke, and there are some ongoing clinical trials assessing their efficacy in humans. In this review, we aim to summarize the recent advances in cell-based therapies to treat stroke.

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