Cell therapy

see Stem cell therapy.

see Cell transplantation.

Cell therapy has been shown to be a key clinical therapeutic option for central nervous system diseases or damage. Standardization of clinical cell therapy procedures is an important task for professional associations devoted to cell therapy. The Chinese Branch of the International Association of Neurorestoratology (IANR) completed the first set of guidelines governing the clinical application of neurorestoration in 2011. The IANR and the Chinese Association of Neurorestoratology (CANR) collaborated to propose the current version “Clinical Cell Therapy Guidelines for Neurorestoration (IANR/CANR 2017)”. The IANR council board members and CANR committee members approved this proposal on September 1, 2016, and recommend it to clinical practitioners of cellular therapy. These guidelines include items of cell type nomenclature, cell quality control, minimal suggested cell doses, patient-informed consent, indications for undergoing cell therapy, contraindications for undergoing cell therapy, documentation of procedure and therapy, safety evaluation, efficacy evaluation, policy of repeated treatments, do not charge patients for unproven therapies, basic principles of cell therapy, and publishing responsibility [1)].

Indications

Cell therapy using mesenchymal stromal cells (MSCs) offers new perspectives in the treatment of traumatic brain injury (TBI).

see Cell therapy for intervertebral disc degeneration.

Stroke

Cell therapy has emerged as an experimental stroke treatment. Blood-brain barrier (BBB) impairment is a key pathological manifestation of ischemic stroke, and barrier repair is an innovative target for neurorestoration in stroke.

Garbuzova-Davis et al., evaluated via electron microscopy the ability of transplanted human bone marrow endothelial progenitor cells (hBMEPCs) to repair the BBB in adult Sprague-Dawley rats subjected to transient middle cerebral artery occlusion (tMCAO). ß-galactosidase pre-labeled hBMEPCs were intravenously transplanted 48 hours post-tMCAO. Ultrastructural analysis of microvessels in non-transplant stroke rats revealed typical BBB pathology. At 5 days post-transplantation with hBMEPCs, stroke rats displayed widespread vascular repair in bilateral striatum and motor cortex, characterized by robust cell engraftment within capillaries. hBMEPC transplanted stroke rats exhibited near normal morphology of endothelial cells, pericytes, and astrocytes, without detectable perivascular edema. Near normal morphology of mitochondria was also detected in endothelial cells and perivascular astrocytes from transplanted stroke rats. Equally notable, they observed numerous pinocytic vesicles within engrafted cells. Robust engraftment and intricate functionality of transplanted hBMEPCs likely

abrogated stroke-altered vasculature. Preserving mitochondria and augmenting pinocytosis in cell-based therapeutics represent a new neurorestorative mechanism in BBB repair for stroke. [2].

1)
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2)
Garbuzova-Davis S, Haller E, Lin R, Borlongan CV. Intravenously Transplanted Human Bone Marrow Endothelial Progenitor Cells Engraft Within Brain Capillaries, Preserve Mitochondrial Morphology, and Display Pinocytotic Activity Towards BBB Repair in Ischemic Stroke Rats. Stem Cells. 2017 Jan 31. doi: 10.1002/stem.2578. [Epub ahead of print] PubMed PMID: 28142208.