OPEN ACCESS Freely available online

Journal of Pharmaceutical Care & Health Systems

Commentary

Transplantation using Human Umbilical Cord Blood Platelets in Neurodegenerative Strategies

Aru J Ward *

Department of Pharmacy, University of Stirling, Scotland, United Kingdom

DESCRIPTION

The use of stem cells to treat or prevent a disease or condition is termed as stem-cell therapy. Hematopoietic stem cell transplantation is the only established stem cell therapy as of 2016. The cells were primarily derived from bone marrow transplantation; however they can also be obtained from umbilical cord blood. The development of various sources for stem cells, as well as the use of stem-cell therapy for neurological illnesses and conditions including diabetes and heart disease, is currently ongoing. Following advancements such as scientists' ability to isolate and culture embryonic stem cells, create stem cells *via* somatic cell nuclear transfer, and apply procedures to create induced pluripotent stem cells, stem-cell therapy has become controversial. This issue is frequently linked to abortion politics and human cloning. Furthermore, efforts to develop treatments based on the transplantation of preserved umbilical cord blood have proven to be controversial.

Large numbers of high-quality stem cells are essential for research and therapy applications. As a result, culture techniques that produce pure populations of tissue-specific stem cells *in vitro* without diminishing stem-cell potential are required. For this, two basic methodologies: two-dimensional and three-dimensional cell culture.

For the past four decades, cell culture in two dimensions has been performed regularly in thousands of laboratories worldwide. On the basal side of two-dimensional platforms, cells are normally exposed to a solid, rigid flat surface and liquid on the apical side. Because they lack the extracellular matrix, which is unique to each cell type, and can alter cell metabolism and impair functionality, surviving cells must adapt significantly to live on such a two-dimensional rigid substrate.

Three-dimensional cell culture methods may be used to establish a bio mimicking microenvironment for stem cells that replicates the three-dimensional extracellular matrix observed in their natural environment (ECM). In recent decades, advanced biomaterials have made major contributions to three-dimensional cell culture systems, and more unique and complex biomaterials for increasing stem-cell proliferation and controlled differentiation have been proposed.

Neurodegeneration: Animal models of brain degeneration, such as Parkinson's disease, Amyotrophic lateral sclerosis, and Alzheimer's disease, have been studied for the effects of stem cells. Preliminary studies on multiple sclerosis have been undertaken, and a 2020 phase 2 trial indicated that patients who received mesenchymal stem cell treatment had considerably better outcomes than those who received a sham treatment. The first clinical trial for an investigational stem cell therapy to replace damaged brain cells in persons with severe Parkinson's disease was approved by the FDA in January 2021.

Brain and spinal cord injuy: Animal models of br ain degeneration, such as Parkinson's disease, Amyotrophic lateral sclerosis, and Alzheimer's disease, have been studied in order to see how stem cells affect them. Multiple sclerosis has been the subject of preliminary research, and a phase 2 trial scheduled for 2020 indicated that patients who received mesenchymal stem cell treatment had much better outcomes than those who received a sham treatment. The FDA approved the first clinical trial for an experimental stem cell therapy to replace damaged brain cells in advanced Parkinson's disease patients in January 2021.

Heart: In persons with serious heart disease, stem cells are being examined. Hundreds of factual discrepancies were found in Bodo-Eckehard Strauer's work, discrediting it. Only a few researchers have found genuine evidence of benefit among multiple clinical trials claiming that adult stem cell treatment is safe and effective. Following the use of bone marrow stem cell treatment in certain preliminary clinical trials, only minor improvements in heart function were observed.

Correspondence to: Aru J Ward, Department of Pharmacy, University of Stirling, Scotland, United Kingdom, E-mail: arujward@gmail.com

Received date: October 4, 2021; **Accepted date:** October 18, 2021; **Published date:** October 25, 2021

Citation: Ward JA (2021) Transplantation using Human Umbilical Cord Blood Platelets in Neurodegenerative Strategies. J Pharma Care Health Sys. S9:003.