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COVID-19 Embryonic Stem Cell Transplantation

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Editorial

Mesenchymal stem cell (MSC) populations that possess comparable potential for multi-lineage differentiation have been isolated in vitro from a variety of bone marrow (BM) and non-BM tissues, such as the placenta, adipose tissue, amniotic fluid, umbilical cord, and peripheral blood [1–10]. Ten to one hundred Colony-Forming Unit-Fibroblast (CFU-F) per 106 Marrow Mononuclear Cells (MNCs) make up the clonogenic BM-human MSC fraction [11]. Human leukocyte antigen (HLA)-DR expression, multipotency (i.e., chondrogenic, osteogenic, and adipogenic), positive expression of surface antigens CD73, CD90, and CD105, and adherence to plastic are the characteristics of BM-human MCSs [11]. By 2000, physicians' interest in intravenously administered MSC treatment had grown [12]. A prior work showed that both human and murine MCSs can cause immunological suppression by drawing in and eliminating auto-reactive T cells through FasL, which in turn promotes macrophage production of TGF-β and the development of regulatory T cells [13]. The connection between MSC-induced Monocyte Chemoattractant Protein-1 (MCP-1) secretion and dying T cells triggers macrophages to release TGF-β, which in turn activates regulatory T cells and enhances immunological tolerance [14]. The therapeutic importance of MSCs was emphasised by their ability to promote wound healing and differentiate and engraft in vivo [15–21].

The recommendations for MSC characterization were developed in 2006 by the International Society for Cellular Therapy. They aim to standardise information regarding the biology, definition, isolation, and characterization criteria of MSCs, their significance in vivo, and institutional and ethical laws related to their clinical usage [11]. Several studies have been studied in China since the COVID-19 pandemic. For example, the following ClinicalYtrials.gov identifiers are being used to fight against severe COVID-19 or COVID-19 pneumonia: NCT04252118, NCT04273646, NCT04276987, NCT04293692, NCT04302519, NCT04288102, etc. [22–27]. MSCs can help regulate the immune system and help patients return to normal, especially the elderly [28]. They can also reduce the overabundance of inflammatory chemicals and the overproduction of immune cells brought on by the COVID-19 [28].

In conclusion, clinical investigations have shown that human MSCs are safe and are presently being considered as a stem cell treatment for several disorders, including severe COVID-19. However, more research is urgently required to examine and refine several aspects of the human MSC culture environment through the creation of a bioprocess that can be run in compliance with Good Manufacturing Practises (GMP).

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