



Mesenchymal stem cell therapy: Novel concept for the treatment of COVID-19 positive patients by immunomodulatory and anti-inflammatory mechanism

Pravin D Potdar

Dr. APJ Abdul Kalam Educational and Research Centre, India

Abstract

Mesenchymal Stem Cells (MSCs) have been widely used in stem cell-based therapy due to their immunomodulatory and anti-inflammatory properties. They secrete many types of cytokines by paracrine secretion leading to this immunomodulation. The immunomodulatory effects of MSCs are further triggered by the activation of TLR receptors in MSCs, which is stimulated by pathogen-associated molecules such as LPS or double-stranded RNA from virus-like the HCoV-19. In December 2019, the whole world has encountered a new pandemic Novel Coronavirus disease 2019 (COVID-19) which is originated from China and spread all over the world in a few months. The Clinical situation of COVID-19 infection varies from mild fever to respiratory failure resulting in acute respiratory distress syndrome (ARDS) and death. Increased proinflammatory cytokine activation with detrimental alterations in the lungs has been suggested as a hallmark in the pathogenesis of infection. Since there is no effective cure or vaccine, primary prevention strategies such as avoiding close contact and attention to personal hygiene are strongly recommended. Recent studies have demonstrated that the first step of the HCoV-19 pathogenesis is that the virus specifically recognizes the angiotensin I converting enzyme 2 receptor (ACE2) by its spike protein and therefore ACE2-positive cells are infected by the HCoV-19 virus. Unfortunately, the ACE2 receptor is widely distributed on cells surface, especially the alveolar type II cells (AT2) and capillary endothelium. It is also revealed that the cellular serine protease TMPRSS2 for HCoV-19 Spike protein priming is essential for the host cell entry and spread and AT2 cells highly express TMPRSS2, allowing viral entry easier. However, the bone marrow, lymph nodes, thymus, spleen, T and B lymphocytes, and macrophages are consistently negative for the ACE2 receptor suggesting that the immunological therapy may be used to treat the COVID19 infected patients. But, the immunomodulatory capacity of the above cell types may not be strong enough, to control the terrible cytokine storm by the COVID19 virus which develops acute respiratory distress syndrome, cardiac injury, and the secondary infection, lead to the death of patients. Therefore, avoiding the cytokine storm may be the key to the treatment of HCoV-19 infected patients. MSCs, owing to their powerful immunomodulatory ability, may have beneficial effects for preventing or attenuating the cytokine storm. Therefore, finding an effective cure for patients suffering from COVID-19 infection is urgently needed. From a theoretical perspective, it is reasonable to expect good outcomes from MSCs therapy in COVID-19 patients due to their close intersections regarding the pathogenesis of the disease and mechanism of action of MSCs. Recently some clinical trials are recorded in China aiming to investigate the effect of mesenchymal stem cells in severe COVID-19 patients and results have shown that MSCs could cure or significantly improve the functional outcomes of COVID19 patients without any adverse effects. Therefore we postulate that MSCs transplantation therapy may explore the new therapeutic potential for curing COVID19 infected patients, which need further investigation.

Biography

Pravin D Potdar is now serving as Department of Molecular Medicine & Biology at Jaslok Hospital & Research Centre, India. He served as Senior Scientist from 1981-2002 at Cancer Research Institute Tata Memorial Centre, Mumbai. Organizing Committee Member of International conference on Advances in Biomedical Engineering to be held at Philadelphia, USA.



14th World Congress on Stem Cell Research, Cell and Gene Therapy
October 30, 2020

Citation: Pravin D Potdar, Mesenchymal stem cell therapy: Novel concept for the treatment of COVID19 positive patients by immunomodulatory and anti-inflammatory mechanism, Stem Cell Congress 2020, 14th World Congress on Stem Cell Research, Cell and Gene Therapy October 30, 2020, 02