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PLX AND MESENCHYMAL STEM CELLS: A NOVEL POTENTIAL THERAPY FOR COVID-19 CRITICALLY ILL PATIENTS

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Coronavirus disease-2019 (COVID-19) pandemic firstly appeared in China in December 2019. No available recommended treatment till now for critically ill patients. This review summarizes the role of PLX and Mesenchymal stem cells as a potential treatment of for critically ill patients with COVID-19.

On December 31st, 2019, the World Health Organization (WHO) was informed of a cluster of cases of pneumonia of unknown cause detected in Wuhan, China.[1] In January 2020, it was announced that a novel coronavirus had been identified from samples of cases. The initial analysis of virus genetic suggested that this was a cause of outbreak (this virus referred to as SARS-COV2), and associated disease as coronavirus disease-19 (COVID 19).[2]

PLX cells are placental derived, mesenchymal-like adherent stromal cells.[3] These cells produce some factors like cytokine, protein, chemokines, and growth factors, which act as a paracrine or endocrine manner.[4] The PLX cells are used parenteral through intravenous or intramuscular injection.[4] There are many products like (PLX-R18, PLX-PAD, and PLX-IMMUNE) for PLX cells.

Previous studies evaluated its efficacy in the treatment of many diseases. PLX-PAD cells were reported treatment of critical limb ischemia in cases unsuitable for revascularization.[3] PLX-R18 cells were shown to secrete hemopoietic proteins involved in maintenance, renewal, differentiation, and mobilization of hematopoietic cells such as GCSF, MCP-I, II-6, and IL-8 in cases of acute radiation syndrome.[5] Moreover, PLX IMMUNE cells were used in the treatment of some cancers as malignant melanoma, as they are induced with tumor necrosis factor-alpha and gamma to alter their secretion profile by affecting the angiogenesis, immune activation, proliferation and metastasis.[6]

Till now, there is no vaccine or specific drug against COVID-19 is produced. The use of PLX cells in preventing and treating the virus, severe pneumonia, and acute respiratory syndrome may be appealing. These cells are allogeneic cells that have an immunosuppressive effect that leads to a reduction of the serum levels of proinflammatory cytokines and chemokines, which attracted less mononuclear/ macrophages to the diseased lungs. Additionally, the increased secretion of IL-10 and VEGF enhanced lung repair.[7] The initial results of their use in seven critically ill patients suffering from COVID-19 induced respiratory failure in Israel are promising.[8]

Another report on seven severe COVID-19 patients from China revealed significant improvement of the inflammatory processes after intravenous injection of mesenchymal stem cells (MSCs).[7] MSCs significantly improve the pulmonary function and symptoms of those patients in two days after transplantation without any adverse effects. Similarly, Biang and his colleagues reported effective modulation of the immune response on the injection of human MSCs obtained from the umbilical cord in a 65-year-old female critically ill COVID-19 patient with exceptional safety.[9]

Conclusively, we think that intravenous injection of PLX or MSCc cells is a safe and effective modality for the treatment of patients with COVID-19 pneumonia, especially critically ill ones.

CONFLICT OF INTEREST

The authors state that there are no conflicts of interest.

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