

## Post Covid-19 respiratory complications treatment by stem cells.

Berejanschi Anghelina<sup>\*</sup>, Nacu Viorel<sup>2</sup>

<sup>1</sup> Department of Anatomy and Clinical Anatomy SMPPhU *Nicolae Testemitanu*, Chisinau, Republic of Moldova.

**Background.** Covid-19 is a new type of coronavirus that manifests itself with acute respiratory failure and acute respiratory distress syndrome that can progress to multiple organ failure. Despite the therapeutic advances, there are challenges in the treatment of this disease, thus directing attention to stem cells.

**Objective of the study.** Presentation of the role of treatment, in patients with post Covid-19 respiratory complications with stem cells.

**Material and Methods.** Review of 25 articles from Pubmed.gov; StemCells journals; The Regenerative Stem Cells Institute; BMC; ERS; Journal of Translational Medicine; American Lung Association.

**Results.** The primary disorder in the pathogenesis of Covid-19 is at the level of the immune system, by acting on the ACE2 receptor in pneumocytes and the production of the cytokine storm, the increase of C-reactive protein levels and the inability to transform pneumocytes type II into type I while maintaining the transition phase of pneumocytes type II. The role of stem cells in the treatment of covid-19 is represented by: Immunomodulatory role - inhibiting the activity and proliferation of B cells, T cells and natural killer, inhibiting the maturation and antigenic presentation of dendritic cells, activating macrophages. Anti-inflammatory role - release of chemokines (CCL5, CXCL9,10,11), secretion of lipoxin A4, TGF- beta, nitric oxide, prostaglandin E2, secretion of IL-10, reduction of IL6, reduction of TNF- alpha, decrease of neutrophils-secretion of repair factors of vascular endothelial growth, platelet-derived growth factor, IGF1 and HGF - activation of angiogenesis. Antifibrotic role- reducing the expression of pro-fibrotic ligate TGF-p1.

**Conclusions.** Stem cells with their significant immunomodulatory functionality can suppress the predominant cytokine storm in the acute phase of the disease. At the same time, stem cell transplantation has been shown to be effective in activating endogenous mechanisms of repair, tissue regeneration and decreased pulmonary fibrosis with increasing pulmonary vascularization and improving oxygen saturation. It has been proven that stem cells do not have receptors for ACE2 and thus they cannot be infected by the SARS-Cov-2 virus.

**Keywords:** Covid-19, cytokine storm, pneumocytes, immunomodulation, anti-inflammatory, repair, fibrosis.