

# COVID-19 and Cellular Therapy



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## COVID-19 & Mesenchymal Cell Therapy derived from Umbilical Cord Tissue

The impact of COVID-19 is being felt worldwide and there is a tremendous amount of research being undertaken to understand this disease, prevent its transmission, and treat those infected. Patients with COVID-19 can present with little to no symptoms, cold or flu like symptoms, or in severe cases, can progress to pneumonia, sometimes leading to death.

Evidence is suggesting patients with severe COVID-19 can suffer from 'cytokine storm syndrome', which is an overreaction of the immune system to the virus. That is, when COVID-19 enters the lungs, it triggers the body's immune response to attack the virus, resulting in localized inflammation. This localized inflammatory response can go into overdrive, resulting in hyper-inflammation which can seriously harm or kill the patient.

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***While many approaches are being investigated, Mesenchymal Stromal Cells (MSCs), especially those from Umbilical Cord Tissue, are showing potential to treat COVID-19.***

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MSCs display potent immunoregulatory and regenerative properties and have been successfully tested in clinical trials for a variety of disorders (e.g., graft vs host disease, respiratory diseases, sepsis and auto-inflammatory/auto-immune disorders). In respiratory illnesses, MSCs have been observed to exert a broad set of potential benefits; potentially improving the lung microenvironment, inhibiting immune system over-activation, protecting lung epithelial cells, promoting tissue repair, preventing pulmonary fibrosis, and/or improving lung function<sup>1</sup>. It is anticipated that Umbilical Cord Tissue-derived MSCs will dampen the ongoing hyper-inflammatory reactions in COVID-19 patients, and therefore assist in returning the activity of the immune system back to normal.

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***Though it is still early, the promising results of MSC administration into patients with COVID-19 and the ongoing clinical trials allow us to be optimistic in this uncertain time.***

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A recently published study evaluated whether infusion of MSCs had a clinical benefit to patients with COVID-19<sup>2</sup>. In this study, 7 patients, with either critical (n=1), severe (n=4) or common (n=3) COVID-19 -related symptoms, were infused with MSCs and monitored for 14 days. Initially, all patients had high fever, weakness, shortness of breath and low oxygen saturation. Two to four days after MSC administration, these symptoms had subsided. Further, the administration of MSCs improved the inflammatory state in the COVID-19 patients. By the end of the study, all patients with common and severe COVID-19 infections had recovered, while the critical patient could be discharged from the ICU with not more than common infection symptoms.

The positive outcome of this study supports the notion that applications of MSCs in COVID-19 patients may lead to regulation of inflammatory responses while at the same time promote tissue repair and regeneration. To-date, The International Registry of Clinical Trials<sup>3</sup> (ICTRP) has registered 527 entries for studies regarding COVID-19. Several of the registered studies are investigating the effect of MSCs in patients with COVID-19, including 4 studies using cells derived from Umbilical Cord Tissue<sup>4</sup>. Currently all but one of these trials are being conducted in China. This will soon change however as Mesoblast, an Australian company, has announced its plan to evaluate its MSC product in patients with acute respiratory distress syndrome (ARDS) caused by COVID-19 in the U.S, Australia, China and Europe<sup>5</sup>

### REFERENCES

1. Hostettler et al (2017) PLoS One 2. Leng et al (2020) Aging and Disease 3. <https://apps.who.int/trialsearch> 4. [clinicaltrials.gov](https://clinicaltrials.gov) 5. <http://investorsmedia.mesoblast.com/static-files/c1428818-0b9f-44f9-bb4f-79ad518002cc>

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