Medical Xpress

Well-known drug could help the most severely affected COVID-19 patients in intensive-care departments

November 29 2021

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Mortality rates for corona patients requiring mechanical ventilation is around 50%, and there are only a few effective treatment options.

However, new research results indicate that a well-known drug, already being used at hospitals, could improve the course of these critically ill patients. The study has just been published in the *American Journal of Respiratory and Critical Care Medicine*.

A research team headed by Prof. Pär Johansson from the Department of Clinical Immunology at Rigshospitalet has investigated whether treatment with prostacyclin can help patients by reducing damage to the endothelial cells, which lines the inside of all blood vessels. A total of 80 patients in intensive-care departments in the Capital Region of Denmark were included in the trial: half received the medicine, while the other half—the control group—received normal saline.

Patients who received three days' treatment with prostacyclin had overall significantly less damage to their vital organs during their stay in the intensive-care department. Furthermore, mortality was halved from 44% for the control group to 22% for the group receiving prostacyclin. The results for mortality are not, however, statistically significant, as this was a study of limited size.

"We found that the patients who had received prostacyclin overall had better organ function and better chances of survival. There are still many COVID-19 patients at intensive care departments around the world and we are very pleased that now it seems there's possibly a better treatment option," said Pär Johansson.

Improve blood vessel patency

Prostacyclin has been in use since the 1980s to treat high blood pressure in the pulmonary. Professor Pär Johansson has previously demonstrated that in low doses it may have a beneficial effect on endothelial cells in critically ill patients in intensive care departments.

"We've discovered that damage to the endothelial cells in the body's smallest blood vessels, the capillaries, can cause a very serious condition for the patient. When the endothelial cells in capillaries are damaged, micro blood clots occur that limit oxygen availability in the vital organs and cause serious damage to the lungs, heart, liver and kidneys. It seems that this process can be reversed by treating patients with prostacyclin," explained Professor Pär Johansson.

Patients are examined for signs of damage to the endothelial cells via a test for a specific biomarker, entitled soluble thrombomodulin. The test was developed by the Danish company BioPorto Diagnostics AS.

The results need confirmation in a larger study

The authors behind the study hope that other researchers will follow up on the results.

"It is important to examine whether the same effect can also be seen when a larger number of patients are investigated," stresses Professor Pär I. Johansson.

The research group behind the study is currently conducting a larger study focusing on the effect of prostacyclin on organ failure in patients with septic shock and severe endotheliopathy. If COVID-19 patients match the criteria for participating, they may be included in this study.

- The study examined the effect, and safety of infusion of prostacyclin compared with a placebo (normal saline) in 80 patients who had been admitted to intensive-care departments at Rigshospitalet, Nordsjællands Hospital, Herlev Hospital, Hvidovre Hospital and Bispebjerg Hospital in the period 15 June 2020 to 25 January 2021.
- The results have been published in the *American Journal of*

Respiratory and Critical Care Medicine.

- The study was supported with DKK 3 million from Innovation Fund Denmark's Grand Solutions—COVID-19.

More information: Pär I. Johansson et al, Prostacyclin in Mechanically Ventilated Patients with COVID-19 and Severe Endotheliopathy: A Multicenter, Randomized, Clinical Trial, *American Journal of Respiratory and Critical Care Medicine* (2021). DOI: 10.1164/rccm.202108-1855OC

Provided by University of Copenhagen