Medical Xpress

Clinicians report improved COVID critical care with extracorporeal membrane oxygenation

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Analysis of the critical care of COVID-19 patient involving the use of extracorporeal membrane oxygenation (ECMO) in University Hospital

Vienna shows that the chances of survival are good. Nearly three quarters of patients who had undergone ECMO treatment between January 2020 and April 2021 survived. In this demanding critical-care technique, a machine partially or completely takes over the patient's respiratory functions outside their body. In an international comparison, this puts Vienna General Hospital and MedUni Vienna among the front-runners.

When ventilators are no longer able to support a COVID-19 patient, critical-care doctors have one more treatment option: extracorporeal membrane oxygenation, or ECMO. The ECMO machine is an "artificial lung" and was developed to treat patients with acute lung failure, who had a chance of their lungs recovering with time. The ECMO machine supplies the blood with oxygen outside the body via a membrane oxygenator, at the same time removing carbon dioxide from the blood.

This treatment is therefore a temporary replacement for the function of the lungs—and also for the heart when applied appropriately. This gives the body time for its organs to recover and resume their function or alternatively bridges the time until a lung transplant can be performed.

ECMO treatment: valuable treatment option for COVID-19

Many COVID-19 patient only have moderate symptoms. However, in a subgroup, the disease leads to severe lung failure, and, in some cases, to heart failure as well. Extracorporeal membrane oxygenation (ECMO) can be a valuable treatment option for such patients. This is now demonstrated by analyses carried out in University Hospital Vienna.

In the period between January 2020 and April 2021, 87 COVID-19 patients received ECMO treatment in Vienna General Hospital, most of

them in the Department of Anesthesia and Critical Care and Department of Medicine I of MedUni Vienna and Vienna General Hospital. The average age of the patients was 57 and they were connected to the ECMO machine for an average of 16.5 days. The 28-day-mortality was 25.4%, with a total of 61 patients surviving.

This treatment outcome evidences the top-quality medical care of COVID-19 patient at the departments of MedUni Vienna and Vienna General Hospital. For example, the results of studies relating to experiences with ECMO treatments from a worldwide patient registry were published in the journal *The Lancet* in October 2020, and these showed a long-term mortality rate of below 40%. This means that the Vienna General Hospital is among the global front-runners. The fact that the intensive care units of Vienna General Hospital and MedUni Vienna were already specialized in the treatment of acute lung failure prior to the COVID-19 pandemic has proved to be a great advantage in the care of very sick COVID-19 patients.

ECMO treatment only possible with a specialized team

As an invasive procedure, ECMO requires a specialized and specially trained team of perfusionists, doctors and intensive care nurses. Patients are connected to the machine by means of a catheter inserted into the jugular or femoral vein. How to handle the cannulas, managing coagulation and determining the appropriate time to start treatment and when to end it are just some examples of the extensive know-how required by the treatment team administering ECMO therapy.

There is only a limited number of specialized and appropriately trained experts capable of applying ECMO. Twenty-five patients are currently receiving ECMO treatment on the critical care units of Vienna General

Hospital and MedUni Vienna, which are therefore almost at full capacity.

More information: Ryan P Barbaro et al. ECMO support for COVID-19: a balancing act – Authors' reply, *The Lancet* (2021). DOI: 10.1016/S0140-6736(20)32517-4

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