

What is the role of Alteco® LPS Adsorber in managing ICU COVID-19 patients?

All over the world, ICU clinicians face hard choices on how to manage severe symptoms and complications of COVID-19 patients with limited ICU resources.

Use it when it matters

The Alteco® LPS Adsorber may be used on COVID-19 patients who are suspected to have endotoxemia and/or sepsis/septic shock. By adsorbing endotoxin from the blood stream, monocyte activity will be reduced which will impact the scale of differentiation into macrophages and cytokines. A treatment with Alteco® LPS Adsorber removes only the endotoxin, letting the patient's immune response regulate itself, while critical cytokines continue doing their job of eliminating the infection in complement to best practice medical management.

Treating sepsis/septic shock

*"Now that more scientific data are available on COVID-19, the European Sepsis Alliance can more definitively state that COVID-19 does indeed cause sepsis."*¹

A recent publication² shows that sepsis is a common complication of the COVID-19 infection. Out of 191 observed COVID-19 patients, 112 gained sepsis, and 54 of those patients died.

Fifty percent of sepsis is caused by gram-negative bacteria in which endotoxin (Lipopolysaccharide = LPS) is present. Endotoxin is *the source* of differentiation to cytokines and macrophages who in turn activate the inflammatory response in the immune system.

When endotoxin binds to toll-like receptors (TLRs), it activates a signaling cascade causing release of pro-/anti-inflammatory cytokines and coagulation disturbances³, and life-threatening conditions as septic shock and multi organ failure can occur.

Treating suspected endotoxemia on advanced respiratory support patients

The management of COVID-19 disease is symptomatic, and supportive care of oxygen therapy represents the major treatment intervention for patients with severe SARS-CoV-2 infection. Mechanical ventilation may be necessary in cases of respiratory failure, whereas hemodynamic support is essential for managing septic shock.

Using mechanical and hemodynamic support heightens the immune response of the patient. It is known for more than a decade that mechanical force gets changed into a chemical stimulus inside the body (mechanotransduction) and may induce severe inflammation. Being on ECMO- and/or a CRRT machine, the immune system gets even more exposed due to complement activation which results in an increase of the endotoxin level.

¹ Marvin Zink. 2020APR07. Update: Can COVID-19 Cause Sepsis? Explaining the Relationship Between the Coronavirus Disease and Sepsis. <https://www.europeansepsisalliance.org/news/2020/4/7/update-can-covid-19-cause-sepsis-explaining-the-relationship-between-the-coronavirus-disease-and-sepsis-cvd-novel-coronavirus>

² Fei Zhou, Ting Yu, Ronghui Du, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study.

³ Cohen. *Nature* 2002.420: 885-891 Clarifications: SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus) is the name given to the 2019 novel coronavirus (a new strain of coronavirus). COVID-19 is the name given to the disease associated with the virus.

Mortality rate of COVID-19 patients who require advanced respiratory support, i.e., invasive ventilation, BPAP or CPAP via endotracheal tube, or tracheostomy or extracorporeal respiratory support has recently been released.

A paper from China, involved 710 COVID-19 patients where 52 were admitted to ICU. Of the 22 who eventually required mechanical ventilation, 86% died⁴.

Intensive Care National Audit and Research Center (ICNARC) in the UK, has reported that 165 COVID-19 patients were admitted to the ICU. Of the 98 patients who received advanced respiratory support, 66% died⁵ compared to the 36% mortality rate of non-COVID patients receiving advanced respiratory support between 2017-2019 reported by ICNARC.

Risk VS benefit

The Alteco® LPS Adsorber has been globally used since 2007 to adsorb endotoxin in patients suffering from endotoxemia. It is a CE-marked Class IIa extracorporeal medical device, which is safely used during hemoperfusion with no contraindications, no side-effects or serious adverse events reported.

This is our friendly reminder that the Alteco® LPS Adsorber is proven to be a very potent treatment option that is now available when it matters in COVID-19 patients' immune response management to fight their cytokine storms!

We welcome the opportunity for Alteco® LPS Adsorber to be part of your ICU toolkit to manage ICU COVID-19 patients.

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⁴ Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med 2020; published online Feb 21. [https://doi.org/10.1016/S2213-2600\(20\)30079-5](https://doi.org/10.1016/S2213-2600(20)30079-5)

⁵ <https://www.icnarc.org/About/Latest-News/2020/03/27/Report-On-775-Patients-Critically-Ill-With-Covid-19>