

Venovenous ECMO application as bridge to recovery or lung transplantation; ongoing challenge as we look at a pre- and post-COVID-19 era

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Since the coronavirus outbreak (coronavirus SARS-CoV-2/Wuhan, China 2019) there have been millions of confirmed cases and deaths worldwide. If we look at new infection and vaccination rates as competing factors, clearly there is an ongoing race between the number of vaccinated individuals and the ability of the virus undergoing new mutations. New virus variants—first described by the geographic location variant found at including “Delta (+),” have again challenged several eastern and middle eastern countries. Observing the current situation in the Middle East the importance of vaccination choice and timing clearly becomes visible.

Seeing the natural history of the pandemic it may be seen as a wake-up call for Europe and the USA! The severity of respiratory involvement in COVID patients is certainly very case-specific. Blazoski et al.¹ report on their single-center Philadelphia experience using venovenous (VV) extracorporeal membrane oxygenation (ECMO) as rescue therapy for COVID-19 acute respiratory distress syndrome (ARDS) patients. Twenty-eight COVID-19 and seventeen flu patients were identified and included in the study.¹ Thirty-day survival rates after ECMO decannulation were 54% (COVID-19 group) and 76% in flu patients. The COVID-19 ELSO Registry reports a 48% in-hospital mortality.² COVID-19 patients who require ECMO support usually have exhausted noninvasive ventilation and require high ventilatory settings to manage partial or global respiratory failure. At our center, we have applied VV ECMO in over 20 patients. Our survival to transfer or discharge rate has clearly been below 50%.

The statement “it is actually like the flu!” was not well-grounded and it still is not.

Once COVID patients develop barotrauma and bronchopulmonary fistula it becomes an even bigger challenge managing ARDS without being able to use high PEEP ventilation.³ So aggressive monitoring of the plateau and peak pressure is important following intubation. The clinical scenario very much enforces a low PEEP ventilation management strategy. Considering hypercapnia is very often the initial clinical picture in ARDS COVID-19 patients low PEEP ventilation can help to reduce hypercapnia.

It clearly is time for a paradigm shift. With over 4,000,000 deaths worldwide and over 600,000 deaths in the USA out-of-box thinking is needed.⁴ At our program in Miami COVID-19 patients who have been on VV ECMO for more than 10 days or could not be weaned off VV ECMO after 4 weeks were offered work up for adult stem cell therapy and lung transplantation starting 2020.⁵ Two COVID-19 patients on VV ECMO were bridged to lung transplantation with a 50% 6 months survival including one case undergoing bilateral pneumonectomy on VV ECMO.

Blazoski et al have very well shown the worse expected outcome of COVID-19-related ARDS based on their single-center experience during the first pandemic surge in the United States.¹ Recently others have published their data with more or less favorable results.⁶ Future studies will show more predictive data and results as we engage more COVID-19 pandemic-related challenges.

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