

Extracorporeal Membrane Oxygenation (ECMO): Can we do it ourselves?

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Abstract

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ECMO: Can we do it ourselves?

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Abstract : ECMO is a selectively available therapeutic option, generally available in a large-size referral healthcare system. In a single-center experience of use of veno-venous ECMO for COVID-19 ARDS in a medium-size healthcare system during the pandemic, West and colleagues in their study have convincingly demonstrated that ECMO can become a broadly available therapeutic option without compromising quality.

Commentary : COVID-19 is an ongoing pandemic. It has exposed the vulnerability of the existing healthcare infrastructure and model of care. The traditional flow in the healthcare system is from a limitedly equipped, generally smaller healthcare system to a comprehensively equipped, larger referral healthcare system for specialized care. ECMO (Extracorporeal membrane oxygenation) is in the realm of such a transfer of care. Central to the success of the CESAR trial, a randomized multicenter trial that showed a survival benefit of ECMO over conventional mechanical ventilation in adults with ARDS (Acute Respiratory Distress Syndrome), was based on this *transfer of care model*¹. COVID-19 has become the leading cause of ARDS and has markedly increased its incidence. While the precise role of ECMO in COVID-19 ARDS is still evolving, ECMO now has become a necessity due to the increased incidence of ARDS². Thus, the format of the *transfer of care model* espoused by the CESAR trial has become flawed due to this sudden change in the ARDS incidence, resulting in a saturation of resources of the specialized referral healthcare systems. West and colleagues, in their study, have nicely shown how high-quality ECMO can be done beyond the

confines of a specialized, large healthcare system, thus meeting this new challenge posed by the COVID-19 pandemic³.

Over ten months, they placed 41 patients on veno-venous ECMO for refractory respiratory failure due to ARDS from COVID-19. They used either a single or a double site cannulation strategy and modified it as per the clinical response from the patient. 42% of the patients were cannulated using ultrasound and fluoroscopic guidance at the bedside and was particularly useful early in the pandemic where infectiousness of the virus was poorly understood and there was limited availability of personal protective equipment. Later in their experience, they used a right atrial to pulmonary artery jugular venous cannula with the ability to support right ventricular function, particularly in patients with associated right ventricular dysfunction. None of the patients required conversion to veno-arterial ECMO. To note, need or conversion to veno-arterial ECMO in COVID-19 ARDS patients increases the risk for mortality². 30 % of the patients were extubated while on ECMO. They did not shy away from complex patients, such as morbidly obese patients with BMI > 40. ECMO may be particularly beneficial in obese patients due to the inherent limitations posed by traditional modes of ventilation in this vulnerable population. Their results have been outstanding, with 63% of their patients surviving to discharge from the hospital. Instrumental to their success was a multi-disciplinary approach, an early cannulation strategy during the disease process, accelerated training on ECMO competence of medical intensive care nursing staff, and a 24-hour advanced practice provider coverage. However, their outcomes were observational without a comparator group where conventional methods were used, and thus the relative efficacy of ECMO cannot be ascertained from this study. Also, they were not a completely ECMO naive institution as they were performing ECMO prior to the pandemic but to a lesser extent. They had a basic infrastructure on which they could scale up. Nevertheless, this scaling up was accomplished despite the resource crunch imposed by the pandemic. Hence, the team needs to be congratulated for meeting the challenge.

While ECMO did influence immediate survival, its impact on the long-term outlook of these patients is unknown. Nevertheless, this study demonstrates that ECMO can become a broadly available rather than a selectively available therapeutic option without compromising quality.

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