Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

both short- and long-term outcomes for COVID-ECMO.[4-7] Additionally, a comparison between patients treated conservatively (maximum medical therapy but not ECMO) is needed, but as other trials and studies have shown us repeatedly, hard to produce.

Rome was not built in a day, and neither will the knowledgebase for COVID-ECMO outcomes. Era-based studies tend to fall into 3 categories: what we know, what we now know, and what we thought we knew and each sequentially builds on the efforts of previous research. This article serves as a meaningful foundation for ECMO use in COVID-19 patients, and almost certainly, the need for reexamination with novel viral variations and future challenges.

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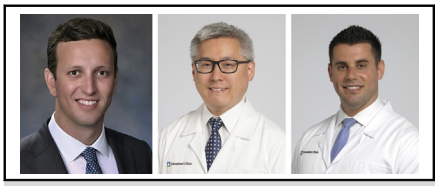
See Article page 2107.

Commentary: Extracorporeal membrane oxygenation for Coronavirus Disease 2019: A step toward enlightenment or still flying blind?



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CENTRAL MESSAGE

ECMO can be a viable therapeutic option in the armamentarium for patients with COVID-19 infection and acute respiratory failure refractory to lung-protective ventilator strategies.

The environment in which we found ourselves during the first wave of the Coronavirus Disease 2019 (COVID-19) pandemic demanded rapid resource mobilization and a constantly adapting approach. In critically ill patients with acute respiratory failure refractory to lung-protective ventilator strategies, limited therapeutic options exist. At centers with the requisite resources, extracorporeal membrane oxygenation (ECMO) can be considered if appropriate and feasible. ECMO in patients with acute respiratory failure from other etiologies has been investigated previously[1-3]; however, there are limited data regarding its use in patients with COVID-19.

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In this context, the retrospective multicenter study by Saeed and colleagues[4] describing the characteristics and outcomes of patients with COVID-19 infection supported by ECMO is timely. The study included 292 patients (median age, 49 years) from 17 centers in the United States (mostly clustered in the geographic Northeast) with confirmatory laboratory testing and arterial oxygen partial pressure:fractional inspired oxygen less than 80 mm Hg. Almost all patients (96%) were placed on venovenous ECMO with a dual cannula configuration using an internal jugular vein and femoral vein (47%) or bilateral femoral veins (19%). The aim of the study was to inform optimal use of this limited yet potentially lifesaving modality. So, what have we learned regarding COVID-19 ECMO?

The cumulative in-hospital mortality at 90 days was 42%, which is in accordance with the rate of 37% reported in the International Extracorporeal Life Support Organization registry.[5] There were also comparable rates of major morbidity, including secondary infection, stroke, and need for renal replacement therapy. In the multivariable analysis, age, serum creatinine, and prior cardiopulmonary resuscitation were identified as independent predictors of mortality. Although it is not surprising that young patients with preserved renal function placed on ECMO before cardiopulmonary collapse had the best chance of survival, the study also revealed those who died were placed on ECMO approximately 4 days later than those who survived. This finding reflects the critical importance of an experienced multidisciplinary team that can expeditiously evaluate, prognosticate, and initiate ECMO in appropriately selected patients.

Although mainly a reflection of the significant challenge generating collaborative multicenter data during the early stages of the pandemic, readers must be tempered in their derived conclusions due to inherent sampling bias in terms of which study sites were included, heterogeneity in management between centers (eg, circuit scheme, cannulation site, anticoagulation regimen), and suboptimal granular data capture (eg, relevant comorbidities, ventilator strategies, use of adjunctive renal replacement therapy, quality of life follow-up). Of the approximately 50% of patients who were discharged or transferred alive, more than 80% were sent home or to a rehabilitation facility. These outcomes are encouraging; however, more detailed chronological follow-up is needed to better understand patients who "survived" versus those who survived with a good functional outcome.

Nevertheless, this study is a valuable contribution to the literature as one of the earliest and largest experiences of COVID-19 ECMO in the United States, and the authors are to be congratulated for their Herculean efforts caring for these critically ill patients. This work, along with other emerging reports,[6] is an important step toward improving our collective understanding of optimal patient selection and resource allocation. As the pandemic continues to smolder, it will be incumbent upon us to embark on a strategic shift from rapid dissemination of information to more rigorous scientific investigation to better define the role of advanced therapies in critically ill patients.

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