Extracorporeal Membrane Oxygenation for Adults

Last Updated: May 31, 2022

Recommendation

- There is insufficient evidence for the COVID-19 Treatment Guidelines Panel to recommend either for or against the use of extracorporeal membrane oxygenation (ECMO) in adults with COVID-19 and refractory hypoxemia.

Rationale

ECMO has been used as a short-term rescue therapy in patients with acute respiratory distress syndrome (ARDS) caused by COVID-19 and refractory hypoxemia. However, there is no conclusive evidence that ECMO is responsible for better clinical outcomes regardless of the cause of hypoxemic respiratory failure.¹⁻⁴

The clinical outcomes for patients with ARDS who are treated with ECMO are variable and depend on multiple factors, including the etiology of hypoxemic respiratory failure, the severity of pulmonary and extrapulmonary illness, the presence of comorbidities, and the ECMO experience of the individual center.⁵⁻⁷ Several multicenter, observational cohort studies from the first half of 2020⁸⁻¹⁰ reported that patients who required ECMO for COVID-19 had a similar mortality to patients in a 2018 randomized study who did not have COVID-19 but who had ARDS and received ECMO.³

However, a recent analysis reported worse outcomes over time among patients who required ECMO for COVID-19.¹¹ The analysis used data from 4,812 patients in the international Extracorporeal Life Support Organization (ELSO) Registry who had COVID-19 and who received ECMO in 2020. At centers that provided ECMO throughout 2020, patients who started ECMO before May 1, 2020, had a 90-day mortality of 36.9% after ECMO initiation (95% CI, 34.1% to 39.7%). At the same centers, patients who initiated ECMO between May 2 and December 31, 2020, had a 90-day mortality of 51.9% (95% CI, 50.0% to 53.8%). Furthermore, at centers that started using ECMO for patients with COVID-19 after May 1, 2020, the 90-day mortality after ECMO initiation was 58.9% (95% CI, 55.4% to 62.3%). These observational data should be interpreted with caution, as they may reflect a changing case mix of patients with COVID-19 who were referred for ECMO.

Without data from controlled trials that have evaluated the use of ECMO in patients with COVID-19 and hypoxemic respiratory failure (e.g., ARDS), the benefits of ECMO cannot be clearly defined for this patient population.

Clinicians who are interested in using ECMO should try to enter their patients into clinical trials or clinical registries so that more informative data can be obtained. More information on the use of ECMO in patients with COVID-19 can be found on ELSO’s Extracorporeal Membrane Oxygenation in COVID-19 website and ClinicalTrials.gov.

References


