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Determinants of long-term outcomes in patients with COVID-19 supported with ECMO

We read with great interest the EuroECMO-COVID study¹ in *The Lancet Respiratory Medicine*. Roberto Lorusso and colleagues should be congratulated for this important research, which contributes to our understanding of the long-term outcomes of COVID-19 in the most severe forms of disease treated with extracorporeal membrane oxygenation (ECMO). However, we would like to draw attention to missing data that could have had a key role in lung recovery, extended ECMO duration, and associated complications.

In the mixed-Cox regression analysis of determinants of in-hospital mortality, including both pre-ECMO and post-ECMO parameters, Lorusso and colleagues¹ did not take into account ventilator settings during ECMO, such as tidal volume, positive end-expiratory pressure, and respiratory rate. Potentially important respiratory mechanics variables, such as plateau and driving pressures, are also missing. Therefore, we cannot rule out the possibility that non-survivors might

have been exposed to higher amounts of lung stress and strain and mechanical power during their ECMO run.

Additionally, prone positioning while on ECMO was not included in the model of Lorusso and colleagues.¹ While awaiting the results of an ongoing randomised trial of proning to facilitate weaning from ECMO in patients with refractory acute respiratory distress syndrome (ARDS)—the PRONECMO trial (ClinicalTrials.gov NCT04607551)—this manoeuvre has increasingly been used during the COVID-19 pandemic, and growing evidence supports the use of prone positioning in patients with COVID-19-related and non-COVID-19 severe ARDS, even during venovenous ECMO support.^{2–4}

Finally, the long-term burden of COVID-19 in this severely ill population goes beyond respiratory sequelae. Indeed, a recent French multicentre study⁵ found that more than 40% of ECMO survivors still suffered from symptoms of anxiety, depression, and post-traumatic stress disorder a year after ECMO onset. These data highlight the need for long-term psychological follow-up of these patients and dedicated psychocognitive rehabilitation programmes.

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