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

Authors' reply

We thank Christophe Guervilly and colleagues for their interest in and appreciation of our prospective, multicentre study on the use of extracorporeal membrane oxygenation (ECMO) in patients with COVID-19 in Europe and adjacent countries.¹

The EuroECMO-COVID study was meant to provide, from the very beginning of the pandemic, very basic and relevant data about pre-ECMO, on-ECMO, and post-ECMO variables, and outcomes including a 6-month follow-up; potentially important information was missing in the vast majority of research and reporting experiences in this setting. The guidelines for ECMO in patients with COVID-19, published at the beginning of the pandemic, provided general rules about indications, ECMO management, and ventilator settings.² We expected most centres to follow these recommendations, particularly with regard to lung-protective ventilation. We were aware that requesting additional data, beyond the chosen dataset,¹ would have hampered the finalisation of the entire study. We argue that patients undergoing ECMO were those with the most severe forms of respiratory insufficiency, and also those with a short duration of mechanical ventilation before ECMO start, as shown by our final findings (median pre-ECMO ventilation time of 4 days).¹ Our study objectives did not focus on ventilator settings, but rather on ECMO application and management, as well as related outcomes. Many other parameters that were not collected could have affected the patient outcome (eg, echocardiographic data showing cardiac impairment, particularly right

ventricular dysfunction, which played an important part in the ultimate survivorship patient outcome). We acknowledge that additional information might have been useful for further clinical research analysis.

Prone positioning was indeed considered in our dataset. Of the 995 proned patients, only 111 (11%) did not continue with prone positioning after ECMO initiation, whereas 884 (89%) continued with proning management. Furthermore, 35 patients who did not undergo prone positioning before ECMO were proned during ECMO. However, the absence of prone positioning during ECMO was not found to be a risk factor for mortality (hazard ratio 1.062, 95% CI 0.875–1.289) and this finding led us to maintain only proning before ECMO in the statistical model. Although some studies have confirmed the benefit of prone positioning in patients with COVID-19,³ such an advantage was not confirmed in a study by the EuroPronECMO Investigators,⁴ or by a meta-analysis⁵ or a propensity-matched study;⁶ prone positioning even appeared to have a detrimental effect in one investigation.⁷ We agree with Guervilly and colleagues that this aspect of care remains a matter for further investigation.

Finally, Guervilly and colleagues emphasise the finding of symptoms of anxiety, depression, and post-traumatic stress disorder 1 year after ECMO in patients with COVID-19. These findings agree with ours, and it was these long-term impairments that prompted the EuroECMO-COVID investigators to provide not only in-hospital information, but also post-discharge outcome data, albeit limited to the first 6 months after ECMO implant. Our findings underline the urgent need for close, regular follow-up of these patients to address not only respiratory complications, but also neuropsychological and cardiocirculatory sequelae.

Author declarations remain the same as in the original Article.

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Published Online
April 5, 2023
[https://doi.org/10.1016/S2213-2600\(23\)00134-0](https://doi.org/10.1016/S2213-2600(23)00134-0)



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