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Lung transplantation for COVID-19-associated ARDS

Authors' reply

Lung transplantation is a life-saving treatment for some patients with severe COVID-19-associated acute respiratory distress syndrome (ARDS) who develop irrecoverable lung injury (figure), with near-term post-transplantation survival no different from that of recipients with chronic lung conditions.¹⁻³ After about 1 year since our first transplantation, we have collectively done over 60 such procedures, with patient survival exceeding 94%. We have no reason to believe that the longer-term outcomes would not follow this trajectory. Regulatory bodies, both in North America and Europe, now recognise COVID-19-associated ARDS as an acceptable indication for lung transplantation. In our opinion, the potentially increased demand-supply discordance, highlighted by Philipp Lepper and colleagues, should not be



Figure: Irrecoverable lung injury in COVID-19-associated ARDS

Contrasting appearance of a COVID-19-afflicted lung (left) and a healthy lung (right). Explanted lungs from patients with severe COVID-19-associated ARDS undergoing double-lung transplantation typically have diffuse parenchymal fibrosis and pneumonitis associated with haemorrhage, necrosis, hilar lymphadenopathy, obliteration of anatomical planes, and pleural thickening. ARDS=acute respiratory distress syndrome.

used to deny lung transplantations in these patients, since this issue can be mitigated through increased use of extended criteria donor lungs, hepatitis C donors, and ex-vivo lung perfusion. Indeed, during our study period, we did 145 additional lung transplantations for patients who did not have COVID-19, with no change in waiting-list mortality.¹

Although lung parenchyma can recover after extended durations of extracorporeal membrane oxygenation (ECMO), as emphasised by Jonathan Messika and colleagues, the in-hospital mortality of patients with COVID-19-associated ARDS requiring ECMO remains as high as 40–50%.⁴ Additionally, post-discharge mortality after severe COVID-19-associated ARDS is also substantial.⁵ Consistent with published reports, we have observed numerous patients become increasingly ill and confined to rehabilitation centres, ultimately succumbing to respiratory complications. Hence, our approach is to continue supporting patients with medical therapies as long as lung recovery remains likely, without pre-determined time cutoffs. When recovery is deemed unlikely, we consider transplantation before lethal complications arise. Our published scientific report identified potential biomarkers of lung recoverability.² However, because clinical availability of these biomarkers is limited, assessment of lung recoverability requires careful evaluation of pulmonary physiology, radiology, histology (when available), patient medical course and complications, response to therapies, and many other clinical factors by an experienced multidisciplinary care team. We also believe that consideration of transplantation sooner than 4 weeks after the onset of ARDS is premature, except in rare cases in which patients develop medically refractory complications.

We strongly disagree with the proposal to set the lung allocation

score to 0 for patients with ARDS. The main purpose of the score is to reflect the urgency and severity of an illness. Denying a life-saving treatment to this population would be a disservice and, in our view, unethical. Lung transplantation for patients with COVID-19-associated ARDS is not an option for every patient and should not be done at all centres. It is our responsibility to determine how to navigate the delivery of a resource-constrained therapy based on our best understanding of programmatic resources, patient selection, and post-transplantation outcomes.

We declare no competing interests.

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