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CORRESPONDENCE

Oxygenation indexes for classification of severity of ARDS

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We read with great interest Catozzi et al. study in which the authors investigate the relationship between gas exchange variables, respiratory mechanics, and anatomical data deriving from quantitative computed tomography scan (CT scan) of moderate and severe acute respiratory distress syndrome (ARDS) patients with P/F ratio < 200 mmHg [1]. Their aim was to evaluate whether oxygenation reflected by P/F ratio and mechanical variables are sufficiently correlated to justify the current guidance of basing therapy intensity on oxygenation criteria. Catozzi et al. concluded that ARDS severity based on P/F ratio did not lead to significant differences in respiratory mechanics, ventilatory settings, or mechanical power and driving pressure that are known to reflect the contemporary prerequisites and determinants of ventilator-induced lung injury (VILI) [2]. As such, Catozzi et al. suggest a prompt reconsideration of recommending respiratory support of ARDS patients based on oxygenation.

The findings of Catozzi et al. can be appreciated particularly in light of previous reports showing that the P/F ratio might not be the best discriminator for the severity of ARDS and that there is a legitimate and serious need to incorporate some of the respiratory support variables, such as positive end-expiratory pressure (PEEP) and mean airway pressure ($\overline{Paw}$) into the P/F ratio [3–5]. Recently, we have described a different oxygenation index termed oxygenation factor ($OF = \frac{P/F}{\overline{Paw}}$) that incorporates $\overline{Paw}$ and showed it to be superior to the P/F ratio in reflecting oxygenation in 150 ARDS patients and resulting in a different classification of ARDS severity [3] than the current classical classification. Earlier, we also confirmed that the OF index is more reliable than the P/F ratio in reflecting intrapulmonary shunt in patients undergoing coronary artery bypass grafting and with no underlying lung diseases [4]. Also, Palanidurai et al. evaluated the predictive validity for hospital mortality of an oxygenation index (P/FP) that incorporates PEEP (P/FP = 10xPaO2/(FiO2xPEEP)) and found it superior to the classical P/F ratio. From a clinical practical perspective, obviously for the same P/F ratio, a patient on a higher PEEP or $\overline{Paw}$ has more severe ARDS than a patient on a lower PEEP or $\overline{Paw}$ and as such using P/F ratio without any consideration for intensity of ventilatory support can be misleading. Both our previous findings and Palanidurai et al.'s findings confirm that the classical P/F ratio can be significantly improved by incorporating mechanical ventilatory support variables into the P/F ratio for superior reflection of ARDS severity and prediction of intensive care unit survival/mortality.

Catozzi et al. deserve to be commended for conducting such a valuable study that questions the practice of tailoring respiratory support in ARDS on oxygenation and recommending prompt and paradigm shift in the management of ARDS away from oxygenation impairment and toward more consideration for respiratory mechanics and other variables of ventilatory support parameters such as driving pressure and mechanical power that truly mitigate the risk of VILI [1]. However, we strongly believe that the role of new and superior oxygenation indexes such as OF and P/FP which already incorporate directly or indirectly some reflector of ventilatory

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support intensity still need to be evaluated for possible use in clinical practice before ruling out any possible role of oxygenation impairment.

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Data availability
Not applicable.

Declarations

Conflicts of interest
The authors declare that they have no conflict of interest.

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