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Comment on "Dynamic Assessment of the ROX Index as a Predictive Tool During High-flow Nasal Oxygen Therapy: Underpinning Facts"

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To the editor,

We have read with much enthusiasm the article of Hancı et al.[1] who have analyzed respiratory rate oxygenation (ROX) index dynamics in patients receiving high-flow nasal oxygen (HFNO) for the treatment of acute respiratory failure in the background of severe acute respiratory syndrome-coronavirus-2 infection. While congratulating the authors for their commendable analysis, we would like to raise certain points for clarification and better understanding of the reported observations.

First, although the success of HFNO therapy can be predicted using the ROX index, it does not take into account the changes in the flow rate that can influence the success of HFNO therapy. Higher flow rates can generate a continuous pressure effect on the airway and favor the lavage of dead space, increased end-expiratory volume, decreased respiratory rate, and diminished work of breathing. They designed their study to switch over to non-invasive ventilation (NIV) or invasive mechanical ventilation (IMV) as rescue therapy in the case of deterioration of patients when patients were treated with HFNO with a flow rate of < 50 l/min Increasing the flow rate would have achieved better outcomes.[3,4] A study reported a positive linear relationship between the amount of delivered flow and the generated mean airway pressure.[5] For every 10 l/min increase in gas flow, the generated mean airway pressure can increase by approximately 1.16 cm H_2O.

Second, the analysis of HFNO failure and subsequent need for NIV/IMV could have been better validated by the incorporation of simultaneous lung ultrasound findings. Being noninvasive and performed at the bedside, lung ultrasound findings of B-line patterns and the lack of aeration in the presence of dyspnea and hypoxemia can be a very useful tool in predicting worsening of clinical condition and possible requirement of intubation.[6]

Third, the proportion of lung involvement can be assessed by computed tomography (CT), which can help in deciding whether the patient would benefit from HFNO/NIV or early intubation. Had the authors included the chest CT severity score as one of the parameters for evaluating ROX dynamics to determine HFNO success, the outcomes could have been better and more firmly established.[7]

Fourth, it is unclear from the reporting whether immunosuppressed states such as the use of systemic steroids have been taken into account for computing the Charlson comorbidity index. It would be interesting to comment whether the use of systemic steroids in this group of patients influenced the ROX index values in any way.

Finally, after addressing these points, this study can be a template for further research to consolidate the evidence about the role of the ROX index as a predictive tool in the early phase of management of coronavirus disease-19 pneumonia.

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