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In Response to "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 would like to express our gratitude to the author of the letter for their insightful comments and valuable suggestions regarding our article titled ROX index Dynamics According to High Flow Nasal Cannula Success in Intensive Care Unit Patients with COVID-19 Related Acute Respiratory Failure.[1] We appreciate the opportunity to address the raised points and further clarify our study.

Firstly, we agree entirely with the author's assertion regarding the influence of changes in the flow rate on the success of High Flow Nasal Oxygen (HFNO) therapy. The points raised regarding the beneficial effects of higher flow rates, including increased mean airway pressure and improved lung mechanics, are indeed valid. Increasing the flow rate could potentially lead to better outcomes in patients receiving HFNO (ref). In our study, we used a relatively low flow rate (≤ 50 l/min) for HFNC therapy because 50 l/min is the maximum flow rate that could be used with the device [HI-Flow Star™ (Dragerwerk AG & Co Germany)] in our institution. At the initiation of the therapy, the device was set to deliver a flow rate of 50 l/min then decreased if the patient could not tolerate it or the patient's respiratory rate decreased without paradoxical respiration or accessory muscle use and PaO_2 > 60 mmHg with ≤ 35% FiO_2 after 24 hours of follow-up with HFNC as our clinic's protocol. Patients who were deteriorating while receiving high-flow nasal cannula (HFNC) therapy at the maximum flow they could tolerate were considered treatment failures.

Secondly, we appreciate the author's suggestion to incorporate simultaneous lung ultrasound (LUS) findings in the analysis of HFNC failure and the need for non-invasive or invasive mechanical ventilation. LUS is an invaluable tool for assessing lung pathology at the bedside and can provide important information regarding lung aeration and the presence of B-lines, which may help predict clinical deterioration and guide therapeutic decisions.[2] However, our study was retrospective, and LUS was not performed or recorded in every patient. Future studies investigating the dynamics of the ROX index in HFNO therapy could benefit from including LUS findings to enhance the accuracy and reliability of the results.

Thirdly, we acknowledge the importance of computed tomography (CT) in evaluating the extent of lung involvement and its potential role in determining the appropriate management strategy, including the selection of HFNO, NIV, or early intubation. Incorporating a chest CT severity score as a parameter to assess the ROX dynamics and correlate them with radiological findings would undoubtedly strengthen the outcomes and contribute to a more comprehensive understanding of the topic.[3] We agree with the author's suggestion and encourage future investigations to consider integrating CT evaluations into study designs.

Regarding the fourth point raised in the letter, we adhered to the original Charlson Comorbidity Scoring system,[4] and AIDS/HIV cases were included in the immunocompromised group, not those receiving corticosteroids. We acknowledge the potential impact of systemic steroids on the ROX index values of COVID-19-related ARDS patients and recognize the need for addressing this confounding factor.[5] In future studies, we will make sure to collect and report data regarding the use of systemic steroids and their potential influence on the ROX index values, providing a more comprehensive understanding of its clinical applicability. These factors can be examined by multivariate logistic regression analysis in prospective studies with a larger number of patients.

We would like to express our gratitude to the author for their constructive comments and insightful suggestions. We believe that addressing these points in future research will contribute to further consolidating the evidence regarding the predictive role of the ROX index in the early management of COVID-19 pneumonia.

Thank you for allowing us to respond to the letter and provide clarification on our study. We greatly appreciate your support and guidance in promoting scientific discourse and advancing knowledge in the field.

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