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LETTER TO THE EDITOR

Reconsidering the interplay between PEEP, optic nerve sheath diameter, and neurological assessment in critically ill patients

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Dear Editor,

The article entitled "The relationship between optic nerve sheath diameter, Glasgow Coma Scale, and the effect of PEEP in critically ill patients: a prospective observational study" was read with great interest (1). The evaluation of optic nerve sheath diameter (ONSD) as a noninvasive surrogate marker of intracranial pressure (ICP) in mechanically ventilated patients is highly relevant to contemporary intensive care practice. However, several aspects of the study merit further clarification.

First, the interpretation of the effect of positive end-expiratory pressure (PEEP) on ONSD would benefit from a more detailed discussion within the context of respiratory physiology. The interaction between PEEP and intracranial dynamics is complex and influenced by lung compliance, chest wall elastance, and venous return. It has been demonstrated that the transmission of intrathoracic pressure to the intracranial compartment varies significantly depending on respiratory mechanics, particularly in patients with low lung compliance, such as those with ARDS (2). In the absence of key ventilatory parameters such as plateau pressure, driving pressure, or compliance, it remains unclear whether the observed changes in ONSD can be directly attributed to PEEP or instead reflect broader cardiopulmonary interactions.

Second, although a correlation between ONSD and the Glasgow Coma Scale (GCS) was reported, the clinical validity of this relationship remains uncertain. In critically ill patients, the assessment of GCS is frequently confounded by sedation, neuromuscular blockade, and metabolic disturbances, all of which may compromise its reliability. Previous studies suggest that ONSD correlates more consistently with directly measured ICP than with clinical scoring systems (3). Furthermore, the relationship between ONSD and neurological severity scores appears to vary across different patient populations (4). Without adjustment for sedation depth or subgroup analyses, the reported correlation may not accurately reflect true neurological status.

Finally, although the study suggests that PEEP-induced changes in ONSD may reflect alterations in ICP, the lack of clinically relevant endpoints limits the applicability of the findings. While ONSD is a promising noninvasive marker, its role in predicting meaningful clinical outcomes remains uncertain. Current evidence indicates that ONSD should not be used as a standalone tool without correlation to invasive monitoring or patient-centered outcomes (3,5). Demonstrating whether changes in ONSD translate into neurological deterioration or adverse outcomes would substantially strengthen the study.

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In conclusion, a more comprehensive evaluation incorporating respiratory mechanics, adjustment for neurological confounders, and clinically relevant endpoints is needed to define the clinical significance of these findings better.

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Study conception and design: MÇ; data collection: MÇ; analysis and interpretation of results: MÇ; draft manuscript preparation: MÇ. The author(s) reviewed the results and approved the final version of the article.

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Conflict of interest

The author declare that there is no conflict of interest.

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