Diaphragm and Lung Ultrasound Indices in Prediction of Outcome of Weaning from Mechanical Ventilation in Pediatric Intensive Care Unit: Correspondence

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To the Editor: We have read the article of Rahman et al. [1] with much interest. We like to raise certain important points in this aspect. The authors [1] have reported that diaphragm thickening fraction (DTF) has a higher sensitivity and better area under curve (AUC) score than diaphragmatic excursion (DE) with the conclusion that DTF is more reliable than DE while opposite view also exists in the literature [2] where DE was found to be more accurate than DTF. Although, DE has a questionable role with respect to functional (contractile limits) evaluation during assisted mechanical ventilation, the opposite finding has also been documented with the fact that physicians in CCU set-up can accurately measure thickness of diaphragm using ultrasound with a high degree of reproducibility in patients receiving mechanical ventilation [3]. Integration of DTF of $\geq 30\%$ combined with lung ultrasound score (LUS) of ≤ 12 have been reported to predict on successful extubation better compared with DTF alone [4]. Combination of rapid shallow breathing index (RSBI) with right DTF $\geq 26\%$ can be a more accurate predictor of successful weaning from mechanical ventilation than RSBI alone [5]. The diaphragmatic rapid shallow breathing index (D-RSBI), the ratio between respiratory rate (RR) and DE, is a promising tool which can predict weaning from mechanical ventilation. D-RSBI (RR/DE) is superior to the traditional RSBI (RR/VT) in predicting weaning outcome especially when monitored at 30 min from the start of spontaneous breathing trial [5]. Given the fact that RSBI can give false positive result in predicting success of extubation and weaning, it is still a valuable clinical tool to predict weaning. However, the DE and

the speed of diaphragmatic contraction appear to be the best parameter for weaning where ultrasound-based bedside monitoring is feasible. The DE and DTF values also can suffer the intra-analyzer and inter-analyzer reproducibility differences for the measurements [5]. Other important issues in ICU set-up are: diaphragmatic dysfunction may be from pulmonary or neuromuscular disease, impediments to successful visualization, such as the right lung's downward excursion and the miniature window owing to the presence of the spleen, critically-ill patients often cannot properly do breath-holding, and scarcity of skilled personnel for ultrasonography in ICU set-up.

Compliance with Ethical Standards

Conflict of Interest None.

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