Lung Ultrasound Score: Does It Really Predict Extubation Failure?

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Dear Editor,

The article titled "Prediction of Successful Spontaneous Breathing Trial and Extubation of Trachea by Lung Ultrasound in Mechanically Ventilated Patients in Intensive Care Unit" by Rajbanshi L et al. was read with great interest and appreciation for their research, and we also want to express our views about the article.

Extubation failure and reintubation have been linked to worse outcomes in intensive care unit (ICU), with studies estimating that these patients have ICU mortality rates between 25 and 50 percent. According to studies, 10–20% of patients in the general ICU population require reintubation after planned extubation.[1] The use of lung ultrasound for weaning and extubation will be a good adjunctive. This study highlighted the role of ultrasound in the same.

Though spontaneous breathing trial (SBT) and extubation readiness trial (ERT) are often used interchangeably in the literature, they represent different concepts, with SBT usually being a component of ERT. In this study, SBT was probably used as part of ERT. Extubation readiness trial starts with spontaneous breathing trial, and mere SBT passing doesn't qualify the patient for extubation as still the primary pathology for which they were intubated might be unresolved.[2] The study aims to look for aeration of the lung-by-lung ultrasound however important factors like pleural effusion, cardiac involvement, pericardial effusion, or the volume overload status and intrathoracic resistances through the inferior vena cava (IVC) diameter evaluation were not taken into account during LUS evaluation. Diaphragm dysfunction also is an important cause of weaning and extubation failure which was also not assessed by ultrasound in this study.[3] These are also important factors such as lung aeration for weaning and extubation. In the case of chronic obstructive pulmonary disease (COPD), the aeration of the lung would be fine but the airways would be problematic unless associated with pneumonia this becomes a confounding factor to the study as only aeration of the lungs was assessed.[4] Integrated LUS which is a 40-point score could have been a better indicator of lung condition, thus a better predictor of extubation readiness.[5] Upper airway obstruction is also one of the major causes of extubation failure.[6] Incorporation of the upper airway into the LUS score/integrated LUS score would have been more beneficial.

Researchers did not classify the cause for the development of distress within 30 minutes of SBT and also did not mention why they decided to do an ultrasound at 30 minutes of SBT but defined SBT success at 2 hours. Lung ultrasound score as 2 hours of SBT could have been more correlating with extubation than at LUS at

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30 minutes. Why did the score change in just 30 mins if only the lung aeration is assessed to further add it has increased which raises the question does the lung worsen on the SBT trial still remains an enigma (?). This study showed that LUS was able to predict extubation failure, but it would have been more informative if the cause of extubation failure was categorized as intra-thoracic, extra-thoracic and upper airway obstruction which was not assessed by the LUS score used in the study.

We appreciate the authors for their study utilizing ultrasound-guided parameters to guide spontaneous breathing trial and extubation. The study also emphasized the fact that weaning and SBT are associated with pulmonary edema which can result in extubation failure. Predicting these findings with ultrasound along with other clinical parameters can help to prevent extubation failure. Further studies involving integrated LUS scores and clinical markers can be incorporated to predict and prevent extubation failure.

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