Insufficient Proof of Concept for Using Ultrasound to Guide Fluid Resuscitation

To the Editor:

The well-designed article by Volpicelli et al.\(^1\) sets out to “assess whether B-lines, and eventually a combination with left ventricular ejection fraction (LVEF) assessment, are useful to differentiate low/high pulmonary artery occlusion pressure and extravascular lung water (EVLW) in critically ill patients.” This study strives to propose a novel monitoring approach but, in our opinion, requires some clarification of the methods and interpretation of the data. Accordingly, we would respectfully ask a few simple queries to the authors.

First, we wonder whether the novel terminology proposed, that is, “A” and “B” patterns defined, respectively, as the “absence of multiple B-lines with regular sliding” and “multiple B-lines, that is, at least three B-lines in a single longitudinal scan, on at least two areas per side” the latter apparently representing “a sign of diffuse interstitial syndrome” may cause confusion with the existing definition and ultrasound detection of A-line and B-line artifacts because A-lines and B-lines may coexist.

Moreover, we wonder whether the study design is reproducible elsewhere, considering that neither interobserver nor intraobserver variability of measures is reported. Because the authors correctly acknowledge that “the number of cases enrolled remained below than was expected and is too small to allow definitive conclusions,”\(^1\) we would respectfully ask whether the reported results, that is, 3 of 18 false positives for the A pattern and 4 of 14 false positives (29.6%) for the B pattern for EVLW 10 ml/kg or less, as shown in the second graph of the article,\(^1\) and 60% of false negatives for the A pattern and 14.3% for the B pattern for pulmonary artery occlusion pressure of 18 mmHg or less, are robust enough to prompt their conclusion “in the first approach to critically ill patients, the concept of using ultrasound to guide fluid resuscitation to avoid deleterious effects on the lung function is confirmed” because even “combination of cardiac evaluation for the LVEF with lung examination did not improve the accuracy of lung ultrasound standing alone in predicting the level of invasive EVLW.” In other words, we would like to know whether the authors advocate the use of this approach only to guide initial therapy, before definitive monitoring is in place, or as it appears from their statements, also thereafter since, based on the current evidence, we would caution against both.

We also respectfully ask whether the authors are recommending this approach as a means of overcoming the current “imprecise monitoring, which may easily lead to iatrogenic catastrophic consequences, such as pulmonary edema due to overhydration, impairment of pulmonary blood gas exchange, or others.” If so, do they consider their reference cardiological assessment, “Impaired function was diagnosed after the eyeballing visual estimation of reduced function corresponding to an LVEF less than 55%, without further distinction between poor and moderate reduction,”\(^1\) suitable for the workup of their “study population, which included a wide range of conditions, from the septic to heart failure patients, from acute respiratory stress disorder to posttransplant patients?” In other words, whether the 55% cutoff for LVEF, assessed “by subcostal view …. by visual estimation of gross wall contraction….visually considered normal or impaired”\(^1\) was actually used as evidence of heart failure in a widely diverse population of critically ill patients, and whether they consider it adequate for heart failure management guidance in intensive care patients?

We hope that the authors will clarify the above, as this challenging article is likely to be quoted as a reference and used as a basis for future research.

Competing Interests

The authors declare no competing interests.

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Reference


(Accepted for publication February 16, 2015.)

Lack of Evidence for the Use of Ultrasound B-line Artifacts to Guide Fluid Resuscitation

To the Editor:

Volpicelli et al.\(^1\) recently published an article advocating the usefulness of B-line counts to differentiate and predict pulmonary congestion and hemodynamic congestion in intensive care patients. May I kindly ask the authors\(^1\) whether there is any evidence that, as the authors write, “the gross evaluation of left ventricular ejection fraction coupled with B-lines assessment is an easy-to-learn technique?” Experience dictates that this would not, in fact, be the case, as B-lines are poorly reproducible measures with different levels of reliability in different hands, in different clinical subsets,