





LETTER TO THE EDITOR

Simplifying volume assessment with lung ultrasound in paediatric haemodialysis patients

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Lung ultrasound is a novel, easy to apply and radiation-free method to evaluate volume overload in haemodialysis patients [1]. We read with great interest the observational study by Fu *et al.* [2], in which 14 paediatric haemodialysis patients were prospectively followed-up for a median 4 months with lung ultrasounds performed on a weekly basis to evaluate volume overload. Study participants were separated into two groups, based on the achievement of dry weight using clinical criteria. Ultrasound B-lines score decreased during sessions and presented a strong correlation with interdialytic weight gain in both groups. The authors suggested that dry weight evaluation methods in dialysis children should ideally not be affected by age, height or weight, and lung ultrasound presents several advantages to this direction, despite the fact that it has not been standardized in paediatric haemodialysis populations.

With regard to the lung scanning technique, this study [2], like most studies employing lung ultrasound in paediatric haemodialysis patients, has applied the 28-site scanning method (16 on the right and 12 on the left hemithorax), which was originally developed by Jambrik *et al.* [3], or a 14-site scanning method for patients with weight <20 kg method (7 on the right and 7 on the left hemithorax) [4, 5]. The Jambrik *et al.* [3] method was most likely used following evidence from studies in adult haemodialysis patients showing that the number of ultrasound B-lines presents strong correlations with left ventricular mass [6], predicts cardiovascular events and mortality [7], and can be successfully used as a guide for dry weight estimation, resulting in significantly lower ambulatory blood pressure levels and improvement in several echocardiographic indexes compared with dry weight estimation with standard clinical assessment [8, 9].

However, applying a 28-site lung ultrasound in paediatric patients can be challenging, especially since most of the relevant ultrasound transducers, such as the sector or the linear probe or even the paediatric small-footprint linear array (hockey-stick) transducer have a size of at least 30–35 mm. Using such probes to measure ultrasound B-lines in 28 sites on the thorax of a paediatric patient may lead to significant overlaps between the different scanning sites. In a recent study, we compared the prognostic performance for death and cardiovascular events of the 28-site and a simplified 8-site B-lines score (4 on the right and 4 on the left hemithorax) in adult haemodialysis patients and found that the two techniques were highly inter-related (Spearman's $\rho = 0.93$, $P < 0.001$) and had a fairly good concordance index ($k = 0.79$, 95% confidence interval 0.74–0.84) [10]. These findings call for future studies examining the agreement between the simplified and the standard 28-site technique in paediatric haemodialysis patients; if positive, these studies may help to simplify and increase the use of lung ultrasound-guided volume assessment in the paediatric population.

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CONFLICT OF INTEREST STATEMENT

All authors disclose that they do not have any financial or other relationships that might lead to a conflict of interest regarding this article.

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