



# Thoracic Ultrasonography in Bronchiolitis: Resolving the 'Gray' Areas

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Point-of-care ultrasonography (POCUS) for lung evaluation is well established in the neonatal intensive care unit (ICU). Its role has evolved from the diagnosis of alveolar interstitial syndromes based on lung artefact patterns described by Lichtenstein [1], to far more precise applications which include region-wise quantification, severity classification, and titration of respiratory support.

The paper by Krishna et al. [2] describes yet another application of lung ultrasonography (LUS) in the classification of severity among children with clinical bronchiolitis. There has been deliberation in literature on the role of LUS in bronchiolitis in the past [3]. This was primarily due to the largely nonspecific and often nonreproducible US findings, particularly in patients with mild or even moderate disease. While the LUS picture described by Krishna et al. [2] is similar to that described previously, an interesting aspect of investigation has been explored, which is, using LUS only for disease severity monitoring.

Similar concerns of reproducibility will exist for this as for the primary diagnostic utility; however, the authors have partially overcome this and demonstrated good interobserver reliability ( $k = 0.86$ ). This was achieved by using a zone-based algorithmic approach as well as a detailed scoring system, which is believed to be the only way to improve the yield of LUS exams, both in the hands of radiologists as well as those not primarily trained in US such as pediatricians, neonatologists and critical care specialists. Indeed, the use of still image captures and stored cine clips is the one-stop method to enable not just better care, but also better training of all those concerned in the interpretation of lung pathology on ultrasonography.

The other parameter that has been evaluated in this paper is the change in diaphragmatic mobility in the presence of lung pathology. Diaphragmatic excursion as well as

thickening fraction were reduced in patients with moderate disease compared to those with mild disease, but the difference was not found to be statistically significant ( $p = 0.597$  and  $0.11$ , respectively). Despite this, the results may be considered to be of clinical importance, since they are consistent with those previously described in the literature [4].

It is also worth a note that since the study populations mostly consist of infants and children, changes in diaphragmatic thickness are usually millimetric measures; thus, similar consistency in measurements must be ensured by rigorous education in artefacts at the pleural and peritoneal interface, as pointed out by Tomà et al. [5].

An important limitation of this study was the lack of study subjects with 'severe' disease categorization. The evaluation of the lungs, more so, the diaphragm becomes increasingly difficult in dyspneic patients, particularly infants, where surface area available for scanning is small, and changing position from supine is often not possible due to oxygen support and other lines. Since this is also the cohort that will most benefit from monitoring of changes and titration of therapy, this must be addressed in future literature on the subject. It would also be useful to have an estimate of the average time required to complete an examination.

In conclusion, the use of POCUS in bronchiolitis can prove to be a useful tool for respiratory monitoring in the hands of various operators with varying experience, if scanning protocol and scoring methods are standardized.

## Declarations

**Conflict of Interest** None.

## References

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