

Lung ultrasound is used in neonatology for diagnostics, monitoring and prognostics, but also for prevention

Luca Bonadies MD, Daniele Donà MD, Eugenio Baraldi MD

Department of Women's and Children's Health, University of Padova, 35128 Padova, Italy

Correspondence to: Eugenio Baraldi, MD, Neonatal Intensive Care Unit, Department of Women's and Children's Health, University of Padova, Via Giustiniani 3, 35128, Padova, Italy. Phone: +390498213560 Fax +390498213502 E-mail: eugenio.baraldi@unipd.it

Keywords : Lung Ultrasound, Bronchopulmonary Displasia, Bronchopulmonary Dysplasia Prevention, Neonatology, Neonatal Respiratory Evaluation

Abbreviated title: Lung ultrasound as a preventive tool in neonatology

To the Editor,

We read with interest the recent paper by Alonso-Ojembarrena A. and colleagues¹, published online in *Pediatric Pulmonology* last September, which showed how lung ultrasound (LU) can identify which premature infants responded to diuretic treatment and could be weaned off their respiratory support (RS).

As the Authors said in their paper, LU is gaining more importance in neonatology every day. The ability of LU to identify infants who will need surfactant, thus enabling an earlier, personalized, physiology based treatment² is the most evident result in this field, in parallel with its high power in differentiating between respiratory distress syndrome and transient tachypnea of the newborn.

The diagnostic power of LU is also supported by strong evidence of its value in adult populations, in cases of pneumothorax, atelectasis, or pleural effusion, for instance.

The importance of LU as a prognostic tool has also been growing recently. Some small studies found that a LU-based semiquantitative score could usefully and reliably predict the onset of bronchopulmonary dysplasia (BPD) in high-risk patients³, and identify infants with incremented inflammatory markers⁴. In our opinion, this is a crucial feature of LU, as it can lead to a more targeted administration of new drugs to contain the burden of BPD⁵.

Another interesting aspect of LU that the Authors¹ mention lies in its ability to pinpoint which infants have certain conditions that, as well as pointing to BPD, make them more likely to need greater RS. Such cases should be identified as soon as possible in order to treat their condition and limit the consequent ventilator-induced lung injury.

The paper stresses the importance of considering all the clinical confounders (such as all those causes of systemic fluid overload or pulmonary edema) that might alter patients' LU score, prompting an overestimation of their likelihood of developing BPD.

Identifying infants who respond better to diuretic treatment adds another important aspect to the clinical picture when it comes to deciding which patients might be extubated or weaned off RS. This can reduce the risk of extubation failure or of an excessive RS weaning, and the related potential morbidities. If future studies support a similar change in LU score after corticosteroid treatment, then LU would be especially useful in predicting extubation failure⁶.

A particular case that remains to be investigated is pulmonary overflow due to patent ductus arteriosus (PDA). This should be investigated as a possible confounder of the LU score. In a complementary role, LU could help us to identify infants whose respiratory distress is at least partially due to hemodynamically significant PDA, and those with no pulmonary edema

component, becoming part of a larger bundle to identify those cases of PDA that need to be treated more urgently, or closed surgically. We wonder if the Authors, given their large neonatal LU database, could tell us more about how the LU score changes in the presence of a hemodynamically significant PDA, before and after its pharmacological or surgical closure, and whether they noted any correlation with the level of pulmonary overflow in the cases of persistent PDA.

In conclusion, with every day that passes, LU is confirming its usefulness as a diagnostic, monitoring and prognostic tool, but it is worth looking closer at its value for preventive purposes too. It might be able to avoid the risk of “iatrogenic BPD” developing due to other causes of long-term oxygen or ventilator dependence going misdiagnosed, which can lead to lung damage.

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