Yes, and no — evidence on lung ultrasound digested

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Jovan Lovrenski [1] and Paolo Tomà [2] have reviewed the body of literature concerning lung ultrasound in children, and they have arrived at completely different conclusions. Dr. Tomà argues that diagnostics cannot rely on artefacts — in this context, A-lines and B-lines — because these are ultimately dependent on probes and scanners. The reader may object that established diagnostic processes do rely — at least in part — on artefacts (acoustic shadowing, reverberation artefact, twinkle artefact, and so on). Dr. Lovrenski, on the other hand, relies fundamentally on published accuracy studies, many of which do demonstrate reasonably good diagnostic performance of lung ultrasound. In this respect, the reader may argue that most of the studies were conducted by enthusiasts in fairly well-defined cohorts with dichotomous diagnostic outcomes.

The evidence is on the table, and the reader — not the editor — must be the adjudicator. However, while the two articles excellently articulate the controversy surrounding lung ultrasound, they also invite a much more fundamental debate. For if, given the same evidence, it is possible to reach two opposite, incompatible conclusions, then it must be the case that there are at least two different ways of considering evidence in the field of radiology.

Dr. Tomà's position obviously depends to some extent on deduction. He uses knowledge from related fields and from his experience. Dr. Lovrenski mostly makes his case based on empirical data. The deductive method is often frowned upon and regarded as a relic from the era before evidence-based medicine. Criticism may be justified: evidence produced deductively is more likely to be shaped by subjective opinions, and by bias in various disguises. The empirical method, on the other hand, is generally thought to be superior: the field of

radiology has for decades been preoccupied with building its empirical castle stone upon stone from reliability studies to clinical outcome studies. The empirical idea is the understructure of evidence-based medicine. Its only problem seems to be that radiologists don't trust it — unless it produces results that confirm preconceptions. Such mistrust may have little to do with the idea but rather with how it is applied. The critical reader of a scientific article will almost universally be able to identify that study conditions were far too idealised — that is, too remote from clinical reality; or that the studied subjects had an unreasonably high pre-test likelihood for one diagnosis or the other; and ultimately that there are numerous limitations to inferring from the study sample to a wider radiologic practice. This is reflected in the near-ubiquitous conclusion: more studies are needed.

Reading the articles and commentaries on lung ultrasound therefore raises several important questions where the most riveting does not relate to the lung or to ultrasound at all.

Compliance with ethical standards

Conflicts of interest None

References

1. Lovrenski J (2019) Pediatric lung ultrasound — pros and potentials. <https://doi.org/10.1007/s00247-019-04525-y>
2. Tomà P (2019) Lung ultrasound in pediatric radiology — cons. <https://doi.org/10.1007/s00247-019-04524-z>

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