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LETTER TO THE EDITOR

# Reliability of sonoelastography in predicting pediatric cervical lymph node malignancy: methodological issues on reliability and prediction

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Dear Editor,

We were interested to read the recent paper by Zakaria OM and colleagues published in the July 2018 issue of the *Pediatr Surg Int* [1]. The authors aimed to evaluate the reliability and accuracy of sonoelastography in diagnosing benign and/or malignant pediatric cervical lymphadenopathy. A prospective study took place over a period of 4 years. A total of 177 lymph nodes (LNs) in 128 children with an age ranging from 11 months to 12 years were studied. Statistical analysis was done to compare the sensitivity, reliability, and specificity of the different US tools in relation to the histopathological findings. Sonoelastography showed a sensitivity of 85.9%, specificity of 100%, PPV of 100%, NPV of 75.9%, and overall accuracy of 90.2% in distinguishing benign from malignant lymph nodes. Using the B-mode ultrasound, an abnormal hilum was seen in 75%. The accuracy of color Doppler US reached 82.7%. They concluded that sonoelastography may be superior to other US modalities in elucidating different cervical lymph node biopsies, helping to distinguish benign from malignant lesions. This may replace lymph node biopsies in the future.

However, these results are not appropriate estimates to evaluate reliability. Reliability (agreement, precision, repeatability) and validity (accuracy) are two completely different methodological issues. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and in addition likelihood ratios positive and negative (LR+ & LR−) are among the estimates to assess validity and not reliability [2–4]. Reliability is the degree of "consistency" or "repeatability" of a measure. To evaluate reliability (precision) of quantitative variables, the use of intraclass correlation coefficient (ICCC) or Bland–Altman plot, and for qualitative variables, the use of weighted kappa can be recommended [3, 4].

Moreover, for prediction, we need data at least from one cohort divided into two to first develop prediction tools or model and subsequently validate it. Misleading results are generally the main outcome of research that fails to validate its prediction tool. Validation should be done by applying different approaches such as split file, bootstrapping or other well-known validation methods [5, 6]. In this letter, we emphasized on differences between accuracy and reliability and their relevant estimates. We also mentioned methodological issues for prediction of an outcome in clinical researches [3–6].

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## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Research involving human participants and/or animals** Not applicable.

**Informed consent** Not applicable.

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