# Magnetic Resonance Imaging vs Transient Elastography in Assessing Pediatric Non-Alcoholic Fatty Liver Disease


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## Background

- Non-alcoholic fatty liver disease (NAFLD) stands as the most common chronic liver disease in the pediatric population and is increasing in prevalence alongside the childhood obesity epidemic.
- Lab tests and biomarkers alone provide low sensitivity and specificity for pediatric NAFLD, while the most stringent diagnostic method of liver biopsy is invasive and expensive.
- Non-irradiating, non-invasive imaging modalities are the ideal approach for diagnosing and staging NAFLD in pediatric patients.
- Presently, ultrasound is not sensitive enough to detect liver steatosis below 33% of hepatocyte involvement. As a result, magnetic resonance imaging (MRI) and transient elastography (TE) are promising diagnostic options for identifying and quantifying liver steatosis in pediatric NAFLD patients.

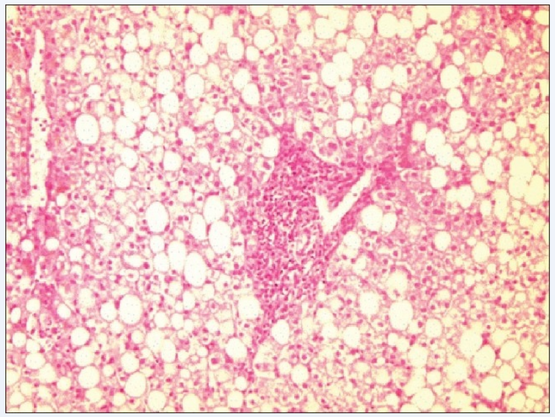

Figure 1. Liver biopsy showing macrovesicular steatosis

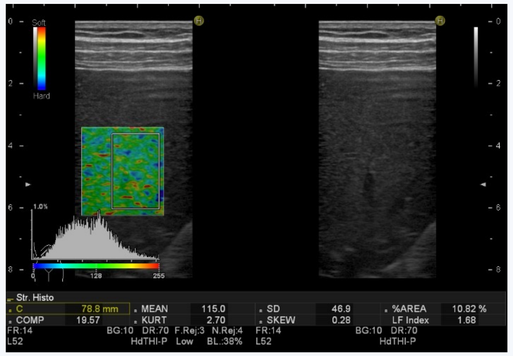


Figure 2. Real-time elastography revealing hepatic steatosis

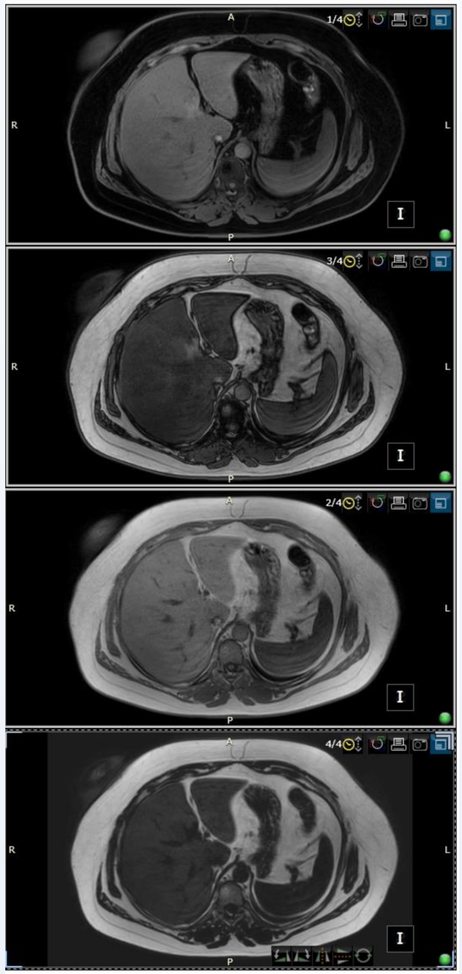


Figure 3. 3T MRI, T1-weighted sequence qualitatively assessing liver steatosis

## METHODS

- A literature review was performed to compare the sensitivity of MRI to TE in diagnosing pediatric NAFLD.
- Results from 5 studies were compiled based on predetermined inclusion criteria.
- Among the 5 studies, a total of 480 cases were imaged. Of these cases, 224 were analyzed with MRI, while 256 were analyzed by TE.[1,2,3,4,5]

## RESULTS

- Of the 224 NAFLD pediatric patients analyzed using MRI, the calibrated MRI fat fraction measurements produced an average sensitivity of 64.9%.[1,2]
- Of the 256 pediatric patients assessed using TE techniques, measurements for hepatic steatosis demonstrated an average sensitivity of 81.1%.[3,4,5]
- Thus, TE shows significantly superior sensitivity compared to MRI in pediatric NAFLD diagnosis ($p < 0.00001$).

## CONCLUSIONS

- The childhood obesity epidemic coupled with rising rates of pediatric NAFLD poses a need for accessible and noninvasive diagnostic technologies. This review suggests that TE offers greater sensitivity than MRI for detecting NAFLD, with the convenience of a bedside imaging technique.
- Additionally, the less lengthy scan is of particular advantage in the pediatric population who may have difficulty complying with awake MRIs. More research should be done to determine the differences in specificity, exam time, and cost.

## REFERENCES


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7. Fig. 2 and 3: Lăpădat, A. M., Jianu, I. R., Ungureanu, B. S., Florescu, L. M., Gheonea, D. I., Sovaila, S., & Gheonea, I. A. (2017). Non-invasive imaging techniques in assessing non-alcoholic fatty liver disease: a current status of available methods. Journal of medicine and life, 10(1), 19–26.