

Comparing Two Strategies for Pediatric Nonalcoholic Fatty Liver Disease (NAFLD) Screening

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Nonalcoholic fatty liver disease (NAFLD) is a growing disease globally. It is strongly related to obesity and insulin resistance. NAFLD poses a public health issue because it may progress to NASH and subsequently to cirrhosis [1]. Currently, NASH cirrhosis is going to be the second most common cause for chronic liver disease in adult patients awaiting transplantation [2]. There is evidence that its prevalence is also increasing in children which creates an urgent need to identify patients with NAFLD and intervene early.

Typically the gold standard for diagnosis for NAFLD is liver biopsy. However it is an invasive procedure and carries the risk of complications including death [3]. So it is reasonable to look for alternative tools especially for screening. Screening test should have the following qualities: high sensitivity/specificity, readily available at a low cost and non-invasive if possible. Unfortunately, no screening tool meets the above criteria in pediatric NAFLD. While American Association for the Study of Liver Diseases (AASLD) had no formal recommendations to screen for pediatric NAFLD [4], the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) recommend using alanine aminotransferase (ALT) as a screening tool in overweight children with risk factors and obese children [5]. On the other hand the European Society of Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) recommended using ALT and ultrasound [6]. The purpose of our recently published study is to evaluate the difference between both guidelines in detecting NAFLD in at-risk children.

In this retrospective study we included overweight children with risk factors for metabolic syndrome as well as obese children seen at a weight management program at a tertiary medical center (Cleveland Clinic Children's, Cleveland, OH). We found that NAFLD prevalence in this population was 58.4% based on the ESPGHAN criteria compared to 26% based on NASPGHAN criteria. Among the subjects classified as "at risk for NAFLD" using the ESPGHAN criteria, 51.7% had low ALT (<54 in males and <44 in females) indicating that using ultrasound in screening augmented the detection rate. Compared to the NASPGHAN guidelines, using ultrasound increased the prevalence from 26% to 58.4% among at-risk children. NASPGHAN did not recommend using ultrasound in screening because it has low sensitivity and specificity in detecting steatosis. This is true with low grade steatosis (steatosis involving <30% of hepatocytes) but its sensitivity increases in higher grades of steatosis. Besides that, our study along with other studies again showed that some patients may be missed if ALT level is used alone.

Other promising imaging modalities are being evaluated including Vibration-Controlled Transient Elastography (VCTE)/Fibroscan®, Acoustic radiation force impulse elastography (ARFI) and MR

Elastography [7]. Those modalities are promising but they are not readily available and can be costly which prevents their implementation in screening at least for now.

The quest continues to find the perfect screening tool for NAFLD and until then liver enzymes with and without ultrasound remain the best available ones.

	AASLD	ESPGHAN	NASPGHAN
Population at Risk	No formal recommendation to screen. If very young or not obese, look for monogenic/inborn error causes	Obese children and adolescents > 3 yo	Obese children and overweight children with risk factors. Begin between 9-11 yo
Liver Enzymes	NA	Increased AST or ALT	ALT > 2 ×ULN for sex persistent for > 3 months
Imaging	NA	Ultrasound	Ultrasound not recommended

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