2D shear wave elastography, a promising screening tool for cystic fibrosis liver disease, shows a correlation between vitamin D and liver stiffness
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Cystic fibrosis–related liver disease is a frequent and early complication of cystic fibrosis, associated with an increase in the morbidity and mortality of this condition. Annual screening is recommended for detecting disease while it is still in its asymptomatic stage. In this retrospective study conducted at a Swedish pediatric cystic fibrosis center, the authors evaluated the use of two-dimensional (2-D) shear wave elastography in the screening for cystic-fibrosis-associated liver disease and also explored the relationship between liver stiffness and glucose tolerance, nutritional status and lung function. The medical records were used to extract pertinent data on age, gender, specific cystic fibrosis transmembrane regulator (CFTR) gene mutations, weight (z-score), height (z-score), serum calcifediol (vitamin D), bacterial colonization, liver enzyme tests, liver biopsy (if available), oral glucose tolerance test and lung function tests, including forced expiratory volume in 1 second percent predicted (FEV1%) and lung clearance index (LCI). The US examinations were performed by pediatric radiologists at the same time as the 2-D elastography evaluations. The study included 51 children through young adults with a median age of 11 years (range 5–18 years); 23 were girls. The US examinations were normal in 32/51 patients, while the livers in the others were considered to be nodular, enlarged or with steatosis. On 2-D shear wave elastography, liver stiffness varied from 3.2 kPa to 23.8 kPa (median 5.2 kPa) and showed positive correlation with age. In four patients who had biopsy-confirmed liver cirrhosis, liver stiffness was significantly higher than in the other patients (median 15.5 kPa; \( P=0.001 \)). The only correlation found between abnormal value of liver enzymes and liver stiffness was with alanine aminotransferase levels (\( r_{49}=0.33 \), \( P=0.02 \)). Liver stiffness showed negative correlation with height, weight, serum vitamin D levels and FEV1% predicted, but no correlation with LCI or with bacterial colonization. Children with abnormal glucose tolerance had statistically significant higher stiffness levels compared to those with normal glucose tolerance. The authors concluded that liver stiffness measurement by 2-D shear wave elastography is a feasible examination and reliable addition to the liver disease screening in children with cystic fibrosis, which is associated with lower vitamin D levels, decreased lung function and abnormal glucose tolerance.

Diagnostic accuracy of point-of-care ultrasound compared to standard-of-care methods for endotracheal tube placement in neonates
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Endotracheal tube placement is a commonly performed life-saving procedure in the neonatal intensive care unit (NICU) and in delivery and operating rooms. Esophageal intubation is the most frequent adverse event associated with this procedure. In this observational diagnostic accuracy study, 20 health care providers certified in its use employed point-of-care ultrasound (POCUS) to confirm appropriate endotracheal tube placement in the trachea. Standard-of-care methods including auscultation, colorimetric capnography and chest radiographs were performed simultaneously. The time for each of these methods was recorded by independent study staff. The intubations took place in neonates in the NICU as well as the delivery and operating rooms. The study enrolled 348 neonates, 58% of whom were intubated emergently; these intubations included 318 tracheal intubations and 30 esophageal intubations, confirmed by at least two standard methods (auscultation, capnography and chest radiography). Comparison of POCUS against standard-of-care methods for endotracheal tube location revealed 99.7% sensitivity, 91% specificity and 98.9% agreement (kappa: 0.93; \( P<0.0001 \)). Comparison of POCUS results against an independent POCUS expert for endotracheal tube location revealed 100% sensitivity, 94% specificity and 99.4% agreement (kappa: 0.96; \( P<0.0001 \)). The median time required for POCUS, capnography and auscultation was 3.0 s, 3.0 s and
Congenital cytomegalovirus (CMV) is globally the commonest congenital infection and has the potential for direct brain injury and disruption of normal brain development. A wide spectrum of brain abnormalities and varied clinical manifestations can be encountered in congenital CMV infection. While both cranial US and brain MRI are performed in cases of congenital CMV infection, the exact role of MRI remains a topic of debate. The authors evaluated the diagnostic value of the combination of both cranial US and brain MRI compared to the use of US alone for the detection of central nervous system (CNS) lesions and determining the need for therapy. The study population consisted of 639 infants recorded in a registry in Flanders, Belgium, who had had both US and MRI performed postnatally. The infants were classified according to Flemish consensus as either asymptomatic, or mildly, moderately or severely symptomatic. The cranial US was interpreted as normal in 480/639 children. Of these 480 children, 93 (19%) had abnormal MRI findings, 85/93 (91%) were classified as symptomatic and 47 as severely symptomatic. Conversely, 56 children had lesions detected on US that were not detected on MRI. Lenticulostriate vasculopathy was seen on US in 70 infants, and on none of the MRI studies. The sensitivity, specificity, positive predictive value and negative predictive value of US for assessing complete CNS involvement were 52.5%, 75.4%, 64.8% and 80.5%, respectively. In the study population, therapy was given to 179/639 (28%) of the neonates, including 47 infants (26.2%) in whom the MRI lesions were the only indication for treatment. The authors concluded that MRI has an enhanced role in evaluating infants with congenital CMV infection but that US and MRI are complementary and the optimal evaluation should include both modalities.

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