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Criteria to Determine Reliability of Noninvasive Assessment of Liver Fibrosis With Virtual Touch Quantification.

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Résumé en anglais	BACKGROUND & AIMS: Virtual Touch Quantification (VTQ) evaluates liver fibrosis in patients with chronic liver diseases by measuring shear wave speed in the liver. We aimed to determine the reliability criteria of VTQ examination. METHODS: We performed a prospective study of 1094 patients with chronic liver disease from November 2009 through October 2016 at Angers University Hospital, and between April 2010 and May 2015 at Bordeaux University Hospital, in France. All patients underwent liver biopsy analysis (reference standard), and VTQ examination was made by experienced operators on the same day, or no more than 3 months before or afterward. Advanced liver fibrosis was defined as fibrosis stage F ≥ 3 according to the scoring system of the Nonalcoholic Steatohepatitis Clinical Research Network, or fibrosis stage F ≥ 2 according to the Metavir scoring system. The diagnostic accuracy of VTQ in detection of advanced fibrosis or cirrhosis was assessed using the area under the receiver operating characteristic (AUROC) and the rate of correctly classified patients. Reliability criteria were defined from the intrinsic characteristics of VTQ examination, which were shown to influence the diagnostic accuracy. RESULTS: VTQ identified patients with advanced fibrosis with an AUROC of 0.773 ± 0.014 and correctly classified 72.0% of patients using a diagnostic cut-off value of 1.37 m/s. VTQ identified patients with cirrhosis with an AUROC value of 0.839 ± 0.014 and correctly classified 78.4% of patients using a cut-off value of 1.87 m/s. The reliability of VTQ decreased with an increasing ratio of interquartile range/median (IQR/M) in patients with intermediate-high VTQ results. We defined 3 reliability categories for VTQ: unreliable (IQR/M ≥0.35 with VTQ result ≥1.37 m/s), reliable (IQR/M ≥0.35 with VTQ result <1.37 m/s or IQR/M 0.15-0.34), and very reliable (IQR/M <0.15). For advanced fibrosis, VTQ correctly classified 57.8% of patients in the unreliable group, 73.7% of patients in the reliable group, and 80.9% of patients in the very reliable group (P < .001); for cirrhosis, these values were 50.0%, 83.4%, and 92.6%, respectively (P < .001). Of the VTQ examinations made, 21.4% were unreliable, 55.0% were reliable, and 23.6% were very reliable. The skin-liver capsule distance was independently associated with an unreliable VTQ examination, which occurred in 52.7% of patients with a distance of 30 mm or more. CONCLUSIONS: In a study to determine the reliability of VTQ findings, compared with results from biopsy analysis, we assigned VTQ examinations to 3 categories (unreliable, reliable, and very reliable). VTQ examinations with IQR/M ≥0.35 and ≥1.37 m/s had very low diagnostic accuracy. Our reliability criteria for liver fibrosis assessment with VTQ will help physicians to accurately evaluate the severity of chronic liver diseases and monitor their progression.
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