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Accuracy of B-mode ultrasonography with or without liver stiffness measurement for chronic liver disease: comparison of diagnostic performance and interobserver variability

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PURPOSE: To investigate the performance change of B-modeultrasonographic (US) images for grading chronic liver disease (CLD) after getting the information from liver stiffness measurement(LSM) with Supersonic shear wave elastography (SWE).
MATERIALS AND METHODS: This retrospective study was designed for 46 patients (M:F = 27:19) who had undergone liver biopsy for CLD. And 33 normal subjects (M:F = 8:25) who satisfied both of the following criteria, APRI < 0.50 and FORNS < 4.21, were included. These normal patients underwent LSM in our hospital for the various causes between January 2012 and March 2012. Two abdominal radiologists reviewed B-mode US image sets randomized by a study coordinator, and classified them into normal, non-cirrhotic CLD, and liver cirrhosis (LC) based on the US features without LSM. After 4 weeks, the radiologists re-reviewed the image sets with data of LSM and repeated to classify into three degrees of CLD. Spearman's correlation was used for assessment US grading and weighted κstatistics was used for interobserver agreement. Z-test was used to compare the correlation coefficients. Diagnostic performance for LC was evaluated by area under the curve (AUC) with ROC curves.
RESULTS: Standard diagnosis was classified as follows: normal (n = 36), control group and F0 stage (n = 3) on METAVIR system; non-cirrhotic CLD (n = 26), F1-F3; LC (n = 17), F4. When reviewing without LSM, correlation coefficients (rho) of each observer were 0.437 and 0.323, respectively. However, using the information of LSM made the correlation with standard diagnosis increased (rho = 0.748 and 0.750, respectively). The change between two reviewing was statistically significant (all $p < .05$). The κ-value of reviewing without LSM was 0.318, but it was also dramatically increased when reviewing with LSM ($\kappa = 0.753$; $p < .05$). The AUCs for the LC of each observer were 0.891 and 0.783 without LSM and 0.904 and 0.900 with LSM, respectively.
CONCLUSION: When LSM is added into B-mode US evaluation of CLD, the efficacy of US would be improved and the interobserver variability of B-mode US would be decreased.