Non-invasive Assessment of Liver Fibrosis by Measurement of Stiffness in Patients with Hepatitis B Virus Infection

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Background/Aims: Transient elastography (FibroScan⁰) is a rapid and non-invasive method to measure liver stiffness, allowing the assessment of liver fibrosis. The aim of this study was to compare and validate the diagnostic accuracy of FibroScan⁰ in addition to simple biochemical markers such as the aspartate transaminase to platelet ratio index [APRI] and AST/ALT ratio, known for the assessment of liver fibrosis in patients with hepatitis B virus infection. Methods: A total of 435 HBsAg positive patients whose liver stiffness was measured by Fibroscan⁰ were prospectively enrolled between July 2005 and March 2006. The liver biopsy was performed in 69 patients within 6 months before measuring liver stiffness. Fibrosis was staged on a 0–4 scale by the Korean Pathologists Association using a modified grading and staging system of chronic hepatitis reported by Batts and Ludwig. Results: 1) According to clinical diagnosis, patients were divided into four groups: Inactive carrier, n=61 (14.0%); Chronic hepatitis, n=200 (46.0%); compensated cirrhosis, n=145 (33.0%); decompensated cirrhosis, n=29 (6.7%). The median values of liver stiffness were 6.4±2.7 kPa for inactive carrier, 8.5±5.5 kPa for chronic hepatitis, 16.0±10.1 kPa for compensated cirrhosis, and 29.6±18.3 kPa for decompensated cirrhosis. Liver stiffness was significantly different between different disease groups (p<.001). 2) According to pathologic fibrosis scoring, there were 8 cases with F1, 36 cases with F2, 5 cases with F3, and 20 cases with F4. The median values of liver stiffness were 6.9±2.1 kPa for F1, 10.6±7.2 kPa for F2, 13.3±6.7 kPa for F3, and 18.3±22.9 kPa for F4. 3) Liver stiffness was well correlated with fibrosis stages (r=0.560, p<.001), compared with APRI (r=0.402, p<.001) and AST/ALT ratio (r=0.016, p<.910). 4) The AUROC of Fibroscan⁰, APRI and AST/ALT ratio values were of the same order: 0.71, 0.66, and 0.50, respectively, for ≥ F2: 0.79, 0.65, and 0.60, respectively, for ≥ F3: 0.80, 0.65, and 0.61, respectively, for F=4, Fibroscan⁰ offered the best diagnostic performance to differentiate from significant fibrosis (≥ F2) and severe fibrosis–cirrhosis (F3–F4). 5) Cut–off values were 7.2 kPa for ≥ F2, 9.5 kPa for ≥ F3, and 10.5 kPa for F4. 6) In simple regression analysis, liver stiffness was correlated significantly to fibrosis, AST, ALT, lobular activity, and porto–periportal activity. In multiple regression analysis, liver stiffness were correlated significantly to fibrosis, AST, and porto–periportal activity. Conclusions: FibroScan⁰ might be a reliable, rapid non-invasive method to diagnose the severity of chronic liver disease and predict fibrosis in patients with chronic hepatitis B.

색인단어: Liver fibrosis, Chronic hepatitis B, Non–invasive assessment, Liver stiffness