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Associations between metabolic syndrome and liver stiffness measured by magnetic resonance elastography in NAFLD patients

Hyo Sun Lee, Ho Jung Jung, Heon-Ju Kwon, Mi Yeon Lee and Yong Kyun Cho
Sungkyunkwan University, South Korea

Background: Metabolic syndrome (MS) and its components are associated with the development and the progression of nonalcoholic fatty liver disease (NAFLD). NAFLD includes a spectrum of liver damage ranging from simple steatosis to nonalcoholic steatohepatitis and advanced fibrosis. In this study, we aimed to evaluate the relationship between liver stiffness measured by magnetic resonance elastography (MRE) and MS components in patients with NAFLD.

Methods: A total 650 middle-aged nondiabetic NAFLD subjects with and without MS [male, n=540 (83.1%); female, n=110 subjects (16.9%); median age, 52 years; range, 31-79] quantified the liver stiffness by using MRE with a 3.0-T MR system. Based on the previous studies, we defined the cutoff value for liver stiffness as 2.87 kPa to differentiate between healthy and fibrous liver. We also examined how liver stiffness is related to individual component of the MS using multivariate logistic regression analysis.

Results: After adjustment for gender and age, liver stiffness was 2-fold higher in subjects with MS than in those without (aOR=2.11; 95% CI, 1.07-4.15). Liver stiffness was correlated significantly with number of MS components using WHO clinical criteria (aOR=1.35; 95%CI, 1.04-1.74), homeostatic model assessment of insulin resistance (aOR = 1.39; 95%CI, 1.18-1.62), body mass index (aOR=1.14; 95% CI, 1.02-1.26), and waist circumference (aOR=1.05; 95% CI, 1.01-1.10). Among MS components, the best correlation of liver stiffness was presence of hypertension. (aOR=2.16; 95% CI, 1.11-4.18).

Conclusions: The liver stiffness was significantly higher in middle-aged nondiabetic NAFLD patients with MS. High insulin resistance and the presence of hypertension were major determinants of increased liver stiffness in NAFLD.

Biography

Hyo Sun Lee is graduated from Chonbuk National University Medical School and completed intern and residency courses at Kangbuk Samsung Hospital. She is currently working as a fellow in gastroenterology and hepatology department at Kangbuk Samsung Hospital.

hsl0206@naver.com

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