Fibrotic burden in non-alcoholic fatty liver disease and the risk of development of chronic kidney disease

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Objectives: To date, longitudinal effect of non-alcoholic fatty liver disease (NAFLD) on chronic kidney disease (CKD) has not been fully explored. Moreover, there is a lack of data evaluating whether the severity of NAFLD affects kidney function. Therefore, this study aimed to investigate the prognostic impact of NAFLD and its fibrotic severity on long-term kidney outcome using a large-scale, community-based, prospective cohort.

Methods: Among 10,030 participants from the Korean Genome Epidemiology Study, 6,757 participants were analyzed in this study. NAFLD was defined as a NAFLD liver fat score of ≥-0.640. Severity of liver fibrosis was assessed by NAFLD fibrosis score (NFS), Fibrosis-4 (FIB-4), and Forns index in the NAFLD group. Study outcome was the development of CKD, defined as estimated glomerular filtration rate <60 mL/min/1.73m² and/or proteinuria of more than 1+ on dipstick.

Results: Among 6,757 participants, 1,774 (26.3%) were defined as the NAFLD group. During a mean follow-up of 113.7±42.4 months, CKD developed in 1,437 patients (21.3%; 22.4/1,000 person-years). The NAFLD group showed a significantly greater risk of developing CKD compared to the non-NAFLD group, independent of metabolic syndrome (hazard ratio [HR]=1.208, 95% confidence interval [CI]=1.051-1.390). In addition, NAFLD patients with advanced degree of liver fibrosis had a significantly higher risk of CKD development (quartile 4 of NFS, HR=1.404, 95% CI=1.048-1.881; quartile 4 of FIB-4, HR=1.508, 95% CI=1.103-2.062; quartile 1 as reference).

Conclusions: NAFLD and advanced liver fibrosis were significantly associated with development of CKD. Of note, the prognostic impact was independent of metabolic syndrome. These findings suggest that assessing both NAFLD and its liver fibrotic burden may be helpful for risk stratification of long-term adverse kidney outcome.