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Association between Serum HDL Cholesterol Levels and the Progression of Chronic Kidney Disease: The Results from the KNOW-CKD

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Objectives : High-density lipoprotein cholesterol (HDL-C) levels are generally decreased in patients with chronic kidney disease (CKD). However, studies on relationship between HDL-C and the progression of CKD are scarce.

Methods : We studied the association between serum HDL-C levels and risk of the progression of CKD in 2,238 participants in the KoreaN cohort study for Outcome in patients With Chronic Kidney Disease (KNOW-CKD). Seventy patients in whom HDL-C levels were not measured were excluded from the analyses. Primary outcome was a composite of a 50% decline in estimated glomerular filtration rate (eGFR) from baseline or end stage renal disease (ESRD). Secondary outcome was the onset of ESRD. Hazard ratio (HR) and 95% confidence interval (CI) were determined using Cox proportional hazard regression models after adjustment of multiple variables including demographics, comorbid condition, lipid-modifying drugs, body mass index, systolic blood pressure, and laboratory parameters.

Results : During a median follow-up of 3.1 (inter-quartile range, 1.6-4.5) years, primary outcome occurred in 335 (15.5%) patients; 32 (34.4%), 97 (18.6%), 89 (14.0%), 56 (12.2%), and 61 (13.3%) in in patients with HDL-C levels of <30, 30-39, 40-49, 50-59, and ≥60 mg/dL, respectively (P<0.001). In a fully-adjusted model, the lowest category with HDL-C of <30 mg/dL (HR, 2.21; 95% CI, 1.30-3.73, P=0.003) and the highest of HDL-C of ≥60 mg/dL (HR, 1.97; 95% CI, 1.30-2.99, P=0.001) were associated with significantly higher risks of composite renal outcome, as compared to a reference category with HDL-C of 50-59 mg/dL. In addition, a fully-adjusted cubic spline model with HDL-C being treated as a continuous variable yielded a similar result. This association remained unaltered in a separate analysis of secondary outcome for the development of ESRD.

Conclusions : In this large cohort of patients with CKD, there was a J-shaped association between serum HDL levels and adverse renal outcomes. Our

findings suggest that role of HDL-C in patients with CKD is distinct from other population without CKD. Future studies should focus on the mechanisms underlying these findings.

Keywords : High-density lipoprotein cholesterol, chronic kidney disease