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Intra-individual Variability in High Density Lipoprotein Cholesterol and Risk of End-Stage Renal Disease: A Nationwide Population-Based Study

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Objectives:

There is a growing evidence demonstrating an association between dyslipidemia and progression of chronic kidney disease (CKD), but results on the effects of high-density lipoprotein cholesterol (HDL-C) on renal outcome have been conflicting. In this study, the relationship between HDL-C variability and the risk for progression to end-stage renal disease (ESRD) was investigated.

Methods: This study analyzed data of 4,283,318 subjects who were free of ESRD at the time of enrollment, received more than three medical examinations from 2009 to 2012, and were followed to the end of 2015, based on the Korean National Health Insurance Service database. HDL-C variability was measured using the standard deviation, coefficient of variation, and variability independent of the mean (VIM).

Results:

A total of 2,095 new cases of ESRD were observed during a median follow up of 3.38 years. There was a graded association between higher HDL-C variability and incident ESRD. In the multivariable adjusted model, hazard ratio comparing the highest and lowest quartiles of VIM of HDL-C was 1.60 (95% confidence interval, 1.39–1.84). The results were consistent when the variability of HDL-C was modeled using standard deviation and coefficient of variation and were independent of other confounding factors, including the presence of CKD.

Conclusions:

We confirmed the importance of high HDL-C variability as an ESRD risk factor. Identification of this risk factor for ESRD may help improve risk stratification and identify new therapeutic strategies to minimize variability in HDL-C level for prevention of ESRD.