

Abstract Type : Oral

Abstract Submission No. : OR-1671

TG/HDL confers predictability of major clinical outcomes in patients with advanced chronic kidney disease?

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Objectives: Dyslipidemia is an essential parameter for the prediction of cardiovascular disease (CVD). We aimed to explore whether lipid profiles could predict major outcomes in patients with advanced chronic kidney disease (CKD).

Methods: We retrospectively reviewed the National Health Insurance Service database for people who received nationwide health screening in 2009. All subjects exposed with a lipid-lowering agent before screening were excluded. The population was divided as control, early CKD (eGFR 45-60 ml/min/1.73 m²), and advanced CKD (eGFR <45 ml/min/1.73 m²) by estimated glomerular filtration rate. The end-point of the study was major adverse cardiovascular events (MACCE). The hazard ratio (HR) of MACCE was calculated using Cox regression models after adjustment of multiple covariates.

Results: A total of 3,634,915 examiners were included in this study, with 66,810 (1.8%) and 404,315 (11.1%) in advanced and early CKD, respectively. For all populations, LDL, TG, HDL, and TG/HDL showed a linear relationship to MACCE. Except HDL, all subfraction showed positive correlation with the risk for MACCE: adjusted HR (aHR) in tenth decile, 1.45 (1.42-1.49) in LDL; 1.25 (1.22-1.28) in TG; 1.30 (1.27-1.33) in TG/HDL; 0.88 (0.85-0.90) in HDL. Although these patterns were similar in TG, HDL, and TG/HDL for all-cause mortality, only LDL showed different pattern for the two outcomes. In the subgroup analysis using LDL, according to the renal function, the significance for the outcomes and a linear pattern was decreased in the advanced CKD group. For the TG/HDL, although the significance was decreased, the linear pattern has maintained in the advanced CKD group (Fig 1).

Conclusions: The pattern and significance of lipid profile were different according to the grade of renal function. Thus, TG/HDL-C should be additionally considered with LDL-C as a target variable in patients with advanced CKD.

Fig 1. The pattern of risk for MACCE and all-cause mortality using TG/HDL and LDL in according to stage of chronic kidney disease. MACCE using (A) TG/HDL, (C) LDL, and all-cause mortality using (B) TG/HDL, (D) LDL.

