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Association of LDL cholesterol levels with the risk of cardiovascular outcome according to stages of chronic kidney disease

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Objectives : The optimal low-density lipoprotein (LDL) cholesterol level to prevent cardiovascular disease in chronic kidney disease (CKD) patients according to their CKD stages remains unknown. This study aimed to explore the association of LDL cholesterol levels with adverse cardiovascular outcomes among patients with different CKD stages.
Methods : Data were obtained from the Korean National Health Insurance Service. Patients who participated in health screenings from 2009 to 2012 and had CKD (defined as eGFR<60 mL/min/1.73 m²) were included. Patients were classified into five LDL cholesterol categories: <70, 70-99, 100-129, 130-159, and ≥160 mg/dL.
Results : During the follow-up period, 10,390 incident myocardial infarction (MI), and 17,619 strokes were reported in 373,064 patients with CKD. In the analysis stratified by CKD stages, the risk for MI was significantly increased in the LDL cholesterol level ≥160 mg/dL among patients with CKD stage 3a (eGFR 45-59 mL/min/1.73 m²) [hazard ratio (HR) (95% confidence interval (CI))]: 1.33 (1.2-1.49). Similarly, the risk for stroke was increased in the LDL cholesterol level ≥160 mg/dL among patients with CKD stage 3a [HR (95% CI)]: 1.14 (1.04-1.24). However, there was no significant relationship between LDL cholesterol levels and risk for MI or stroke among patients with CKD stage 3b-5.
Conclusions : Among patients with CKD, LDL cholesterol level was a significant risk factor for subsequent MI and stroke, and the association was identified only among patients with mild kidney dysfunction. However, further research is needed, because the number of patients with LDL cholesterol level ≥160 mg/dL and advanced CKD was relatively small in this study.