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The Effect of Statin Therapy on Clinical Outcomes in Patients with Chronic Kidney Disease: The Results from the KNOW-CKD

Min-uk CHA[1], Misol LEE[1], Ki heon NAM[1], Seong yeong AN[1], Jong hyun JHEE[1], Seohyun PARK[1], Hyoungnae KIM[1], Hae-ryong YUN[1], Youn kyung KEE[1], Tae-ik CHANG[2], Jung tak PARK[1], Tae-hyun YOO[1], Shin-wook KANG[1,3], Kyu hun CHOI[1], *Seung hyeok HAN[1]

[1]Internal Medicine, College of Medicine, Institute of Kidney Disease Research, Yonsei University, Seoul, Korea, Korea,South, [2]Internal Medicine, National Health Insurance Service Medical Center, Ilsan Hospital, Goyang, Gyeonggi-do, Korea, Korea,South, [3]Internal Medicine, College of Medicine, Severance Biomedical Science Institute, Brain Korea 21 PLUS, Yonsei University, Seoul, Korea, Korea,South

Objectives : Although use of cholesterol-lowering drugs failed to decrease cardiovascular events and mortality in dialysis patients, statin therapy is a main part of the management of lipid disorders in patients with chronic kidney disease (CKD). However, the effects of statin use against CKD progression and cardiovascular events are still under debate in these patients. Furthermore, it is unknown whether clinical outcomes are affected by lipophilic or hydrophilic nature of statins.

Methods : We studied the effects of use and types of statins on clinical outcomes in 2,238 patients using the database from the Korean Cohort Study for Outcome in Patients with Chronic Kidney Disease (KNOW-CKD). Statin users were defined if they were treated with statins at baseline. In addition, statin users were further classified into lipophilic or hydrophilic statin users depending on types of statins. Primary outcome was a composite of a 50% decline in estimated glomerular filtration rate (eGFR), end stage renal disease, cardiovascular events, and death.

Results : The mean age was 52.3±12.4 years, 987 (62.8%) patients were male, and 438 (27.9%) patients had diabetes. The mean serum LDL cholesterol level was 98.6±31.3 mg/dL and the mean eGFR was 63.1±27.4 ml/min/1.73 m2. There were 794 (50.5%) statin users at baseline. During a mean follow-up duration of 38 months, the composite outcome occurred in 74 (9.3%) patients among statin users as compared to 55 (7.1%) among non-statin users (P=0.119). In a multivariable Cox model after adjustment of confounding factors, statin use was not associated with a decreased risk of primary outcome (hazard ratio [HR], 0.85; 95% confidence interval (CI), 0.67-1.07; P=0.168). However,

in a subgroup of patients with eGFR of ≥ 30 ml/min/1.73 m2, statin users were significantly associated with a 39% reduction in primary outcome as compare to non-statin users (HR, 0.61; 95% CI, 0.39-0.95; P=0.030). In addition, hydrophilic statin users had a lower risk of developing the composite endpoint than non-statin users in this subgroup (HR, 0.57; 95% CI, 0.34-0.97; P=0.037), whereas lipophilic statin users did not have such benefit (HR, 0.65; 95% CI, 0.38-1.09; P=0.104). However, there was no difference in HRs for primary outcome between hydrophilic and lipophilic statin users.

Conclusions : In this nationwide cohort study, statin use was associated with improved outcomes in early stages of CKD and the effectiveness was similar between hydrophilic and lipophilic statin users.

Keywords : Statin, lipophilicity, chronic kidney disease