Smoking and the risk of coronary artery calcification in patients with chronic kidney disease: The results from the KNOW-CKD

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Objectives: Smoking is a well-established risk factor for cardiovascular disease in patients with chronic kidney disease (CKD). However, the effect of detailed smoking history on cardiovascular disease has not been fully explored in these patients. This study aimed to investigate the association of smoking status and coronary artery calcification (CAC) in a nationwide prospective cohort of CKD.

Methods: We included 1,248 patients with CKD stage 2 through 5 (nondialysis) from the KoreaN Cohort Study for Outcome in Patients with Chronic Kidney Disease (KNOW-CKD). Patients were categorized into three groups including never, former, and current smoker groups, and pack-years were calculated. CAC was defined as a CAC score >10 Agatston units using a multi-slice computed tomography.

Results: The mean age of patients was 53.5±12.4 years, and 761 (61.0%) patients were men. The mean eGFR was 49.5±29.6 mL/min/1.73m². There were 642 patients (51.4%) in the never smoker group, 395 (31.7%) in the former smoker, 211 (16.9%) in the current smoker group. CAC was found in 508 (40.7%) patients. In a multivariable logistic regression analysis after adjustment of confounding factors, current smokers indicated a higher risk of CAC compared with never smokers (odds ratio [OR], 1.831; 95% confidence interval [CI], 1.140-2.940; P=0.01). Current heavy smokers (>20 pack-years) had the greatest risk of CAC (OR, 2.057; 95% CI, 1.144-3.700; P=0.02). In contrast, former smokers were not associated with CAC compared to never smokers (OR, 1.412; 95% CI, 0.929-2.145; P=0.11). In the former smoker group, even patients with heavy smoking history (>20 pack-years) had no significant relation to the risk of CAC (OR, 1.384; 95% CI, 0.844-2.269; P=0.20).

Conclusions: Current smokers with higher pack-years were associated with significantly greater risk of CAC in CKD patients, but former smokers were not. These findings suggest that smoking cessation strategy with a detailed smoking history taking should be prioritized in these patients.