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Type 2 diabetes mellitus modifies the relationship between coronary artery calcification and adverse kidney outcome in patients with chronic kidney disease

Hae-ryong Yun¹, Seung Hyeok Han²

¹Department of Internal Medicine-Nephrology, Yongin Severance Hospital, Korea, Republic of/
College of Medicine, Institute of Kidney Disease Research, Yonsei University, Seoul, Republic of
Korea

²Department of Internal Medicine-Nephrology, Severance Hospital, Korea, Republic of/
College of Medicine, Institute of Kidney Disease Research, Yonsei University, Seoul, Republic of
Korea

Objectives: Kidney function decline faster in patients with type 2 diabetes mellitus (T2DM) than in those without. We previously showed that coronary artery calcification (CAC) is a strong risk of adverse kidney outcome. Here, we examined whether T2DM could modify the relationship between CAC and the progression of chronic kidney disease (CKD).

Methods: 2067 participants from the KoreaN Cohort Study for Outcome in Patients With CKD were enrolled. The main exposures were T2DM and CAC. The primary outcome was CKD progression defined as a composite of a 50% decline in estimated glomerular filtration rate or kidney failure with replacement therapy. Multivariable cause-specific hazard function was employed to determine the association between the main exposures and the primary outcome.

Results: During 8633 person-years of follow-up, the primary outcome occurred in 565 (27.3%) participants. In the multivariable cause-specific hazard model, both T2DM and CAC Agatston score (CACS) >0 were associated with a 1.80- and a 1.41-fold increased risk of CKD progression compared with counterparts. There was a significant interaction between T2DM and CAC for the primary outcome. In patients without T2DM, CACS >0 was not associated with the primary outcome compared with CACS of 0. However, in patients with T2DM, CACS >0 was associated with a significantly higher risk of CKD progression (adjusted hazard ratio, 2.12; 95% confidence interval, 1.64-2.75). In addition, a 1-SD increase in CACS was associated with 1.11-fold higher risk of CKD progression. Notably, this association was also significant in patients with T2DM who had CACS of 0. The slope of eGFR decline was steeper in patients with T2DM and the magnitude of decline was greater when CACS >0.

Conclusions: CAC were more strongly associated with risk of CKD progression in patients with T2DM than in those without. Thus, clinical implication of CAC may differ depending on the presence of T2DM.

Figure 1