



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

KSN SEOUL, KOREA
2026

The 46th Annual Meeting of the Korean Society of Nephrology



Jun 11 (Thu) – 14 (Sun), 2026

COEX, Seoul, Korea

Abstract Type : Poster exhibition

Abstract Submission No.: A-0419

Abstract Topic : Hypertensive Kidney Disease + Vascular Biology in CKD

Renal Artery Calcification and Long-Term All-Cause and Cardiovascular Mortality in Older Adults

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Objectives : Renal artery calcification (RAC) reflects advanced vascular pathology and may identify a high-risk phenotype in chronic kidney disease (CKD). However, its association with long-term mortality and potential modification by diabetes mellitus (DM) or renin–angiotensin–aldosterone system inhibitor (RAASi) use remain uncertain.

Methods : We conducted a retrospective cohort study of adults aged ≥ 60 years who underwent abdominal computed tomography (CT) and had at least three serum creatinine measurements at Chung-Ang University Hospital between 2005 and 2020. Renal artery calcification score (RACS) was quantified using the Agatston method and categorized as RACS = 0, RACS > 0 (Low), and RACS > 0 (High, above the median among RACS-positive patients). The primary outcomes were all-cause and cardiovascular (CV) mortality. Multivariable Cox models adjusted for age, sex, hypertension, dyslipidemia, baseline eGFR, and RAASi use. Effect modification by DM and RAASi was assessed using stratified analyses and interaction terms.

Results : Increasing RACS severity was associated with progressively worse survival. Compared with patients without RAC, those with low and high RACS had significantly higher risks of all-cause mortality (adjusted hazard ratios [HRs] 1.10 and 1.26 in non-DM; 1.19 and 1.31 in DM, respectively). A similar graded association was observed for CV mortality, particularly among those with high RACS. In interaction models, RACS remained independently associated with both outcomes. No significant interaction was observed between RACS and RAASi use, whereas a modest interaction between DM and RAASi was noted for mortality. Kaplan–Meier curves demonstrated stepwise declines in survival across RACS categories.

Conclusions : Renal artery calcification on CT is a strong, independent predictor of all-cause and CV mortality in older adults, regardless of diabetes status or RAAS blockade, supporting its role as a practical imaging biomarker for vascular risk stratification in CKD.

KM_mortality.png



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