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**The Role of Non-Traditional Risk Factors and Biomarkers in Prediction of Cardiovascular Events and Mortality in Patients with Chronic Kidney Disease: The results from the KNOW-CKD**

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**Objectives:** In this study, we conducted comprehensive analysis on whether non-traditional risk factors can predict the future adverse outcomes beyond traditional risk factors. We also compared predictability of each factor to establish the best predictive model.

**Methods:** Data were retrieved from the KNOW-CKD cohort database. After excluding 576 patients with missing data, 1662 patients were included. Primary outcome was a composite of CVEs or death. We constructed step-wise models based on traditional and non-traditional risk factors. Model 1 included traditional risk factors only. Model 2 additionally included renal parameters such as eGFR and proteinuria. In model 3, non-traditional risk factors such as coronary artery calcium score (CACs), hs-CRP, FGF-23, left ventricular mass index (LVMI), brachial-ankle pulse wave velocity (PWV), phosphate, and cardiac troponin T (cTnT) were individually added to model 1. We then compared the predictability of these models using area under the receiver operator characteristic curve (AUROC), c-statistics, net reclassification improvement (NRI), and integrated discrimination improvement (IDI).

**Results:** After median follow-up of 3.03 years, 84 CVEs and 46 deaths occurred. In multivariable-adjusted Cox models, CACS, PWV, hs-CRP, cTnT, and LVMI were significantly associated with increased risk of primary outcome. Inclusion of renal parameters did not increase predictability compared with traditional risk factors alone. Among non-traditional risk factors, CACS- PWV- or hsCRP-added model increased predictability, whereas the others did not. These factors have superior predictability to renal parameters. Furthermore, adding CACS, PWV, and hsCRP together to renal parameters significantly improved predictability compared with traditional risk factors alone and renal parameters.

**Conclusions:** Several non-traditional risk factors can predict the future development of CVEs or death better than traditional risk factors alone or renal parameters. In addition, combined assessments with markers of calcification, arterial stiffness, and inflammation yielded the best predictability.