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Associations of Metabolic Variabilities and Cardiovascular Outcomes According to eGFR in CKD: A Nationwide Observational Cohort Study

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Objectives: The impact of baseline estimated glomerular filtration rate (eGFR) on the risk of adverse outcomes according to metabolic parameter variabilities in chronic kidney disease (CKD) has rarely been investigated.

Methods: We conducted a retrospective nationwide cohort study using the National Health Insurance System data in Korea from 2007 to 2013 to identify individuals who underwent ≥ 3 health screenings (Figure 1). We assessed the differences in degree of the association between metabolic variability and adverse outcomes according to eGFR levels.

Results: During a total follow-up of approximately 60 million person-years, 223,531 deaths, 107,140 myocardial infarctions, and 116,182 strokes were identified in 9,971,562 patients. Low eGFR categories and higher metabolic variability scores were associated with a higher risk of adverse outcomes (Figure 2). The degree of association between metabolic variability and adverse outcomes was significantly larger in those with low eGFR categories than in those with preserved eGFR (interaction P-value <0.001). Representatively, those with high metabolic variability in the ESKD group showed a prominently higher risk for all-cause mortality [adjusted HR 5.28 (4.02, 6.94)] when the degree was compared to the findings in those with preserved (eGFR ≥ 60 mL/min/1.73 m²) kidney function [adjusted HR 2.55 (2.41, 2.69)].

Conclusions: The degree of adverse association between metabolic variability and poor prognosis is accentuated in patients with impaired kidney function. Particular attention for metabolic variability may be needed in the chronic kidney disease population.

Study population