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Association between plasma uric acid levels and mortality and cardiovascular outcomes according to kidney function.

Young Eun Kwon, Shin Young Ahn, Gang-Jee Ko, Young Joo Kwon, Ji Eun Kim
Department of Internal Medicine-Nephrology, Korea University Guro Hospital, Korea, Republic of

Objectives: Plasma uric acid levels rise with worsening renal function, but it is not known whether uric acid levels affect the risk of death and cardiovascular disease according to renal function.

Methods: We conducted a multicenter retrospective observational cohort study based on data from the Observational Medical Outcomes Partnership Common Data Model. Adult non-dialysis patients with at least one measurement of serum uric acid levels during study period were screened, and the participants were classified according to their estimated glomerular filtration rate (eGFR); eGFR \geq 60 ml/min/1.73m² (high eGFR) and eGFR < 60 ml/min/1.73m² (low eGFR). Primary outcome of this study was all-cause mortality. And secondary outcomes were the development of myocardial infarction requiring coronary intervention and heart failure.

Results: We included 240197, 84858, and 59044 participants from three centers. In multivariable Cox regression analysis, uric acid level showed J-shaped association with all-cause mortality risk in both high and low eGFR groups. In pooled analysis for three centers, pooled hazard ratios for mortality in uric acid levels > 10 mg/dL compared to uric acid levels 6-7mg/dL were 1.8 (1.36-2.39) and 2.0 (1.51-2.65) in low and high eGFR groups, respectively. The risk for myocardial infarction was neither associated with uric acid levels in low and high eGFR groups from all three centers. The risk for heart failure showed linear association with uric acids levels, especially in high eGFR groups, and this finding was consistent in three centers.

Conclusions: Plasma uric acid levels showed J-shaped association with mortality regardless of eGFR status, while it showed linear association with heart failure in high eGFR participants