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High-sensitive C-reactive protein and all-cause mortality in Korean patients with chronic kidney disease: Results from KNOW-CKD

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Objectives: High sensitive C-reactive protein (hs-CRP) is a representative marker of inflammation and associates with the development of cardiovascular events (CVEs) and increased mortality in patients with chronic kidney disease (CKD). However, serum level of hs-CRP is lower in East Asian patients with CKD than in those in Western countries. Here, we studied the association of hs-CRP with CVEs and all-cause death in Korean CKD patients.

Methods: Among 2,238 patients with non-dialysis CKD enrolled in the KoreaN cohort study for Outcome in patients with Chronic Kidney Disease (KNOW-CKD), a total of 2,017 patients were included in the analysis after excluding patients who did not measure hs-CRP at baseline and who have no data of CVE and mortality. Patients were classified into three groups; hs-CRP<1 (n=1,233), 1.00 to 2.99 (n=507), and≥3 mg/L (n=277). The primary outcome was a composite of CVEs or all cause death. CVEs were defined as non-fatal myocardial infarction, unstable angina, hospitalization for heart failure, or non-fatal ischemic stroke.

Results: The median CRP level was 0.60 mg/L (IQR 0.21-1.70) and the median eGFR was 46.7 ml/min/1.73 m^2 (IQR 28.7-73.8). During the median follow-up of 4.0±1.8 years, there were 193 (9.57%) CVEs and 80 (3.97%) all-cause deaths. The composite outcome occurred in 15.5% of patients with hs-CRP ≥3 mg/L compared with 9.9% and 8.1% of patients with hs-CRP mg/L of 1.00-2.99 mg/L and <1 mg/L, respectively (P=0.007). In multivariable Cox analysis after confounders, hs-CRP ≥3 mg/L was associated with a 1.59-fold higher risk of the composite outcome than hs-CRP<1 mg/L (95% CI, 1.08-2.35). When hs-CRP was treated as continuous variable, the results were similar. Furthermore, predictive ability of hs-CRP was greater than that of conventional factors.

Conclusions: Serum hs-CRP level was low but an independent predictor of adverse outcome in Korean CKD patients.