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Rapid decline in kidney function is associated with higher hemoglobin variability in chronic kidney disease

Hyo Jin Kim, Da Woon Kim, Harin Rhee, Sang Heon Song, Eun Young Seong
Department of Internal Medicine-Nephrology, Pusan National University Hospital, Korea, Republic of

Objectives: This study aimed to evaluate hemoglobin variability in patients with chronic kidney disease (CKD) according to decline in kidney function.

Methods: We analyzed patients from the KoreaN cohort study for Outcome in patients With CKD (KNOW-CKD). Rapid decline in kidney function was defined as a decline in the estimated glomerular filtration rate (eGFR) of >3 mL/min/1.73 m^2/year. Hemoglobin value was measured at 0, 6, and 12 month and annually for up to 8 years. Hemoglobin variability was calculated by standard deviation. Higher hemoglobin variability was defined as a hemoglobin variability value greater than the median.

Results: Among 1895 patients, 736 (38.8 %) were in the rapid kidney function decline group. In 1472 patients who were 1:1 propensity score-matched, the baseline eGFR was not significantly different between the non-rapid and rapid kidney function decline groups (48.2 ± 26.9 vs 46.9 ± 26.2 ml/min/1.73m^2, P = 0.345). The use of iron supplements (P = 0.536) or erythropoiesis stimulating agents (P = 0.699) was similar in both groups. In multivariable logistic regression analysis, rapid decline in kidney function was significantly associated with higher hemoglobin variability (odds ratio [OR]: 1.81; 95% confidence interval [CI]: 1.43–2.28; P < 0.001). This association was prominent in the group without anemia at baseline (OR: 2.82; 95% CI: 1.99–4.01; P < 0.001).

Conclusions: Rapid decline in kidney function is associated with higher hemoglobin variability in patients with CKD. Attention should be paid to hemoglobin variability in patients with a rapid decline in kidney function.