

The association between Anemia and Abnormal Bleeding Times in Patients with Chronic Kidney Disease

Ha Yeon Kim, Eun Hui Bae, Seong Kwon Ma, Soo wan Kim

Department of Internal Medicine, Chonnam National University Medical School, Gwangju, Korea

Background: Platelet dysfunction associated hemorrhagic complications and chronic anemia are often encountered in patients with chronic kidney disease. Decreased hemoglobin (Hgb) level reduces the rheologic interactions between vessel walls and platelets and weakens the ability of red blood cells to scavenge nitric oxide. The present study aimed to evaluate the association of anemia and abnormal bleeding time in patients with chronic kidney disease.

Methods: We retrospectively analyzed the data of 1022 (60.24±15.89 years, men 58.7%) patients with chronic kidney disease, which was estimated glomerular filtration rates (eGFR) <60 mL/min/1.73m². Age, gender, Hgb, hematocrit (Hct), platelet (PLT), blood urea nitrogen (BUN), creatinine (Cr) levels were determined. Bleeding times were estimated using a platelet function analyzer 100 (PFA-100).

Results: Patients with prolonged bleeding time (bleeding time >182 sec) were older age and lower eGFR, Hgb, Hct and PLT, and higher BUN and Cr levels compared to those with normal bleeding time. The prevalence of abnormal bleeding time was found to be higher as Hgb declined (25.0% for patients with Hgb ≥10 mg/dL (n= 595), 31.9% for patients with 8 ≤ Hgb <10 mg/dL (n=343), and 43.4% for patients with Hgb <8 mg/dL (n=84), p<0.001, respectively). eGFR was decreased as a Hgb declined (29.8±19.0 mL/min/1.73m² in patients with Hgb ≥10 mg/dL, 16.0±13.0 mL/min/1.73m² in patients with 8≤ Hgb <10 mg/dL, and 10.3±8.61 mL/min/1.73m² in patients with Hgb <8 mg/dL, p<0.001, respectively). Multivariate analysis revealed that age (OR, 1.019; CI, 1.010 -1.029), 8 mg/dL ≤ Hgb <10 mg/dL (OR, 1.214; CI, 0.873-1.686), Hg <8 mg/dL (OR, 1.820; CI, 1.084-3.055), 15 mL/min/1.73m² ≤eGFR <30 mL/min/1.73m² (OR, 1.616; CI, 1.053-2.481), eGFR <15 mL/min/1.73m² (OR, 1.668; CI, 1.160-2.397), thrombocytopenia (PLT <150#109/L) (OR, 2.659; 95% CI, 1.981-3.569) were independently associated with prolonged bleeding time.

Conclusion: Severe anemia (Hgb <8 mg/dL) is independently associated with prolonged bleeding time in chronic kidney disease, even after adjusting for eGFR and other potential confounders

Key Words: Bleeding time, PFA-100, Anemia