Comparison of Hemoglobin Level in Chronic Kidney Disease with and without Secondary Hyperparathyroidism

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Background: Anemia in chronic kidney disease (CKD) is a common problem in clinical practice. Various causes of anemia in CKD were identified, but in some cases, etiology remained unknown. Almost all of these patients in KCMH were sent to hematologists for investigation involving bone marrow study with negative results in most of them. Secondary hyperparathyroidism in chronic kidney disease is one of the important causes of anemia, especially in hemodialysis patients. This condition is unrecognized in some cases. In this study, we would compare hemoglobin levels between the two groups of normal and high parathyroid levels undergone by bone marrow study. Other causes of anemia were excluded.

Objective: To compare hemoglobin level in CKD-patients with and without secondary hyperparathyroidism.

Methods: We retrospectively collected data from anemic CKD-patients undergoing bone marrow study in hematology clinic, KCMH in the past 10-years. The variable data of baseline characteristics and laboratory data, including hemoglobin level, iron status, creatinine clearance, calcium, and phosphate were compared between normal and high PTH groups (cut-off at 65 pg/mL), adjusted by univariate and multivariate analysis.

Results: Forty-three patients were included in this study (24 male and 19 female, with mean age 63 (33-88) years). The patients were ESRD diagnosed on hemodialysis (83.7%). Others were CKD stage 3, 4 and 5 (9.3%, 4.7% and 2.3%, respectively). Primary renal disease was unidentified (46.5%), diabetic nephropathy (32.6%), chronic glomerulonephritis (9.3%), and hypertensive nephropathy (2.3%). In high PTH groups with defined cut-off level above 65 pg/mL (34 cases, 79.1%), a significantly lower hemoglobin level was noted (8.29 vs 9.24 mg/dL, p=0.032). Moreover, higher dose of erythropoietin among high PTH group was required when compared to low PTH group (16,352.94 vs 12,444.44 unit/week, p=0.024). Considering the variables impacting on hemoglobin level, a strong inverse correlation of iPTH level was observed (r=-0.543, p-value 0.000), likewise the BMI and serum phosphate. However, in multi-variate analysis, only serum phosphate was significantly associated with hemoglobin level (p-value 0.050).

Conclusion: There is a significant lower hemoglobin level in secondary hyperparathyroidism among CKD-patients. Most factor that impacts serum hemoglobin is serum phosphate. These findings may encourage clinicians to concern more on PTH level for anemia correction.

Keywords: Anemia, Chronic kidney disease, Secondary hyperparathyroid, Epo unresponsiveness