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Implementation of Korean CKD-MBD management recommendations in hemodialysis patients: A quality improvement study

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Objectives : Although the KDOQI and KDIGO chronic kidney disease-mineral bone disorder (CKD-MBD) guidelines are well known to nephrologists in the world, many dialysis patients including South Korea are not within the target ranges recommended by these guidelines. In Korea, practical guidelines are not established yet and most of patients have been treated with various guidelines and the Korean national health insurance standards (NHIS). Based on Korean NHIS and recent understandings of CKD-MBD, we recommended treatment strategies for management of secondary hyperparathyroidism and abnormalities of Ca-P metabolisms (Figure 1). This study was aimed to determine whether serum mineral profiles are improved by implementation of our recommendations in maintenance hemodialysis (MHD) patients, using a quality-improvement strategy.

Methods : A total of 356 patients from seven dialysis units were included. They were undergoing MHD for more than 3 months before collection of baseline data. After we followed our recommendations for one year, final data of serum phosphorus, calcium, alkaline phosphatase and iPTH were compared with the baseline. In the middle of our study period, the medical team in each dialysis unit was educated on our recommendations.

Results : The final serum phosphorus concentration was not different from the baseline (baseline 4.83 + 1.47 mg/dL vs. final 4.93 + 1.49 mg/dL, P=0.311 by Wilcoxon signed-rank test). However, serum calcium significantly increased during our study (8.93 + 0.79 mg/dL vs. 9.14 + 0.76 mg/dL, P<0.001).

Consistent with this, serum alkaline phosphatase (115 + 88 U/L vs. 79 + 48 U/L, P<0.001) and iPTH (295 + 276 pg/mL vs. 241 + 229 pg/mL, P<0.001) were significantly decreased. However, we found no significant changes in percentage of patients within the target range of phosphorus (baseline 53.6% vs. final 46.4%, P=0.447 by McNemar test) and calcium (50.0% vs. 50.0%, P=0.937). The percentage of patients within the target range of alkaline phosphatase (17.1% vs. 82.9%, P<0.001) but not iPTH (46.8% vs. 53.2%, P=0.497) significantly increased during our study.

Conclusions : The Korean CKD-MBD management recommendations are feasible to practice in our MHD patients and may help ameliorate high turn-over bone disease. Long-term follow-up evaluations are necessary to see whether these can affect uremic bone disease and cardiovascular calcification in our patients.

Keywords : Korean CKD-MBD management recommendations; Hemodialysis; Quality improvement