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Chronic Kidney Disease-Mineral Bone Disorder in Korean Patients: A Report from the KoreaN Cohort Study for Outcomes in Patients With Chronic Kidney Disease (KNOW-CKD)

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Objectives : Several studies have shown ethnic differences in the regulation of mineral and bone metabolism in patients with chronic kidney disease (CKD). However, there are limited data regarding the ethnic differences in mineral and bone metabolism and vascular calcification between Asian and non-Asian patients with CKD. This study examined the characteristics of biochemical parameters, bone diseases, and vascular calcification in Korean patients with CKD not yet on dialysis

Methods : Serum levels of fibroblast growth factor 23 (FGF23), intact parathyroid hormone (iPTH), 25-hydroxyvitamin D3 (25D), and 1,25-dihydroxyvitamin D3 (1,25D); lumbar spine, total hip, and femur neck bone mineral densities; and brachial-to-ankle pulse wave velocity (baPWV) representing vascular calcification were measured at baseline for 2,238 CKD patients in the KoreaN Cohort Study for Outcomes in Patients With CKD (KNOW-CKD).

Results : Increases in serum FGF23 and iPTH preceded changes in serum calcium and phosphate, similar to Western populations. However, the 25D and 1,25D levels decreased earlier than serum FGF23 or iPTH increased, with a decreased estimated glomerular filtration rate in Korean CKD patients. Vitamin D deficiency occurred in 76.7% of patients with CKD stage 1. Bone mineral densities were lowest in CKD stage 5 (lumbar spine, −0.64 ± 1.67; total hip, −0.49 ± 1.21; femur neck, −1.02 ± 1.25). Osteoporosis was more prevalent in patients with higher CKD stages. The mean baPWV, abdominal aortic

calcification, and coronary calcium score also increased, with declined eGFR.

Conclusions : A decline in serum vitamin D levels was observed in early CKD stages before significant increases of FGF23 and iPTH in the Korean CKD population compared with that in Western populations. Increased bone disease and vascular calcification occurred in early-stage CKD, similar to that of Western populations.

Keywords : Chronic Kidney Disease; Bone Diseases; Vascular Calcification; Korean