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Clinical characteristics of low turnover bone disease in Korean dialysis patients; a multicenter prospective cohort study

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Objectives: The risk of low turnover bone disease characterized by an extremely slow rate of bone formation and resorption, which may aggravate the risk of fracture and vascular calcification, is known to be increased in dialysis patients. Here, we assessed clinical characteristics associated with low turnover bone disease in Korean dialysis patients

Methods: Total 888 adult dialysis patients from a prospective cohort data of 18 medical centers in South Korea were included. Patients were divided into two groups according to their PTH levels; Low turnover bone disease was defined as $PTH < 100$ pg/mL, and clinical characteristics were compared with the others ($PTH \geq 100$ pg/mL).

Results: Among total 888 patients, the number of low turnover bone disease group (LTB) was 153 (17.2%). LTB group showed higher age (61.0 ± 11.7 vs 58.7 ± 12.1 , $p=0.036$). LTB group also showed elevated serum calcium and vitamin D levels (Calcium, 9.1 ± 0.7 vs 8.8 ± 0.7 , $p < 0.001$; vitamin D, 12.4 ± 13.6 vs 17.3 ± 10.2 ; $p < 0.001$.) as well as higher bone density (-1.5 ± 1.2 vs. -1.7 ± 1.1 , $p=0.037$). In terms of medications, the proportion of using of Ca-based phosphate binder was significantly higher in LTB group, while the use of vitamin D analogues was lower (Ca-based phosphate binder: 41.7% vs. 31.1%; $p=0.014$, vitamin D analogue: 42.4% vs 57.3%; $p=0.001$). In the multivariable logistic regression for low turnover bone disease, age, serum calcium, serum vitamin D level, and Ca-based phosphate binder usage increased the risk of low turnover bone disease, while ionized calcium level and vitamin D analogue usage significantly decreased the risk of low turnover bone disease.

Conclusions: Clinical and laboratory parameters associated with low turnover bone disease in Korean dialysis patients were elucidated in this analysis. Further evaluation regarding the effect of each variable should be needed in the future.