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Risk factors for low bone mineral density (BMD) in dialysis patients according to T- or Z-score measured by dual-energy X-ray absorptiometry (DXA)

Jeong Ah Hwang, Younghoon Song, Jaeun Shin, Ji Eun Kim, Eunjung Cho, Shin Young Ahn, Gang Jee Ko, Young Joo Kwon
Department of Internal Medicine, Korea University Guro Hospital, Korea, Republic of

Objectives: Although there are complex mechanisms for low BMD with disturbed mineral metabolism in dialysis patients, guidelines suggest risk assessment for fracture with BMD by DXA in dialysis patients. We aimed to elucidate the characteristics of dialysis patients associated with low BMD.

Methods: Total 811 adult dialysis patients examined with DXA were included from prospective cohort of 18 centers in South Korea. We differentially evaluated BMD of dialysis patients according to gender and menopausal status. Male patients under age 50 and premenopausal women were evaluated by Z-score. T-score were used in the others. The reference values for T- and Z-score adapted from WHO guideline.

Results: Among 164 patients consisted of young male and premenopausal female, low BMD by Z-score<-2.0 were manifested in 19 patients (11.6%). In this group, female gender, low sodium and high ALP were associated with low BMD, while obesity and vitamin D analogue prescription were inversely associated with low BMD. Among 647 patients evaluated with T-score, male was 373, and 57 (15%) of 373 showed low BMD by T-score<-2.5. Low BMD male patients showed higher prevalent cerebrovascular disease and PTH, and lower body mass index (BMI), albumin, and sodium, and under less usage of Ca-free phosphate binder. In multivariate logistic regression analysis, high prevalence of cerebrovascular disease and low BMI were significantly associated with low BMD by T-score in male patients. Among postmenopausal female patients evaluated with T-score, 115 (42%) of 274 showed low BMD, and age and ß$_2$-microglobulin were higher, whereas BMI, albumin and magnesium were lower in low BMD group. In multivariate logistic regression analysis, higher age and lower BMI and albumin were associated significantly with increased risk of low BMD in postmenopausal female patients.

Conclusions: It was demonstrated there were differences according to gender and menopausal status regarding the risk factors associated with low BMD in dialysis patients.