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HYPERPARATHYROIDISM AND VITAMIN D LEVELS IN PATIENTS WITH STAGE III- IV CHRONIC KIDNEY DISEASE

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PURPOSE: Bone mineral disease is an important complication of Chronic Kidney Disease(CKD). CKD-MBD is defined as a systemic disorder of mineral and bone metabolism due to CKD, manifested by abnormalities of calcium, phosphorus, parathyroid hormone (PTH), vitamin D metabolism and/or abnormalities in bone turnover, mineralization, volume linear growth, or strength and/or extraskeletal calcification. Data on Mineral Bone Disorder(MBD) is mainly derived from studies which have been performed in dialysis patients. We aimed to investigate MBD in predialysis patients in a country with adequate sun exposure.

METHODS: Between November 2013 and February 2014, 113 stage 3-4 CKD patients who were admitted to outpatient clinic of Department of Nephrology were enrolled into the study. Demographic, clinical and lifestyle characteristics were recorded by a standard questionnaire. Serum creatinine, calcium, phosphorus, parathormone (PTH), 25-hydroxyvitamin D (25-OH-Dvit) and 1.25-dihydroxyvitamin (1.25-OH-Dvit) levels were measured .

RESULTS: Eighty-five patients had stage 3 CKD**,** and 28 patients had stage 4 CKD. The mean age was 59.9 ± 11.6 years, and M/F ratio was 67/46. Results of demographic, clinical, lifestyle features and laboratory findings of patients were shown in Table 1 . The prevalence of hyperparathyroidism was found to be 57.5%. Hyperparathyroidism was significantly more frequent in patients with stage 4 CKD than that of stage 3 CKF (89.3% vs. 47.1%; p=<0.001). The frequency of low 25-OH-Dvit levels was 89.4%, with similar ratios in the two stages. The mean phosphorus level was lower in patients with low 25-OH-Dvit group than that of normal group(3.09±0.5 vs. 3.4±0.5;p=0.041) . 76.9% of women who was wearing veil had low 25-OH-Dvit levels(<15 mcg/L) (p=0.02).Cardiovascular disease was significantly more frequent in patients with lower 25-OH-Dvit levels(<15 mcg/L) than that normal group (38.6% vs. 0% ; p=0.008). The mean 1.25-OH-Dvit level was lower in patients with 25-OH-Dvit low group than that of normal group (60.33 ± 21.6 pg/ml vs. 281.48 ± 188.8 pg/ml; p<0.001) . CKD patients were divided into two groups using the 25th percentile cutoff (54.53 pg/ml) for 1.25-OH-Dvit. The mean PTH level was significantly higher in the low group compared to those of the high group (p=0.048).

Table 1. Demographic, clinical, lifestyle features and laboratory results of patients according to the stages.

	All CKD (n=113)	Stage 3 CKD (n=85)	Stage 4 CKD (n=28)	P value *
Sex (male, %)	59.3	61.2	53.6	0.477
Age (year)	59.94 ± 11.6	60.56 ± 12.2	58.05 ± 9.7	0.321
Diabetes mellitus (%)	45.1	49.4	32.1	0.111
Hypertension (%)	85	88.2	75	0.125
Cardiovascular disease (%)	34.5	35.3	32.1	0.761
Adequate sun exposure (%)	37.2	38.8	32.1	0.526
Women wearing covered dress (%)	69.6	66.7	76.9	0.724
eGFR (ml/min)	40.12 ± 12.1	45.7 ± 7.9	23.14 ± 4.3	<0.001
Calcium (mg/dl)	8.15 ± 0.6	8.14 ± 0.56	8.18 ± 0.62	0.915
Phosphor (mg/dl)	3.12 ± 0.5	3.09 ± 0.5	3.23 ± 0.48	0.213
PTH (pg/ml)	89.54 ± 68	68.77 ± 33.5	152.6 ± 102	<0.001
25-OH-Dvit (mcg/L)	10.55 ± 7.6	10.99 ± 8.06	9.21 ± 5.8	0.28
1,25-OH-Dvit (pg/ml)	83.8 ± 92.7	87.2 ± 95.8	73.5 ± 83.3	0.221
1.25-OH-Dvit (<54.5mcg/L), (%)	24.8	21.2	35.7	0.122

*Comparison of stage 3 and 4.

CKD, chronic kidney disease ; BMI, body mass index; eGFR, estimated glomerular filtration rate; PTH, parathormone, 25-OH-Dvit, 25-hydroxyvitamin D; 1.25-OH-Dvit, 1.25-dihydroxyvitamin D.

CONCLUSION: We found a high prevalence of mineral and bone disorders, especially 25-OH-Dvit deficiency among patients with stage 3-4 CKD. The patients with 25-OH-Dvit deficiency also had low 1.25-OH-Dvit levels. We believe that 25-OH-Dvit deficiency is a preventable problem in our country where it is often possible to get adequate amount of sunlight exposure.

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