Bone Mineral Density is Associated with Hypercalciuria in Primary Hyperparathyroidism

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Aim: The most common clinical presentation of primary hyperparathyroidism (PHPT) is asymptomatic and it is diagnosed incidentally without developing complications. In our study, we aimed to examine the characteristics of participants with primary hyperparathyroidism and the relationship between bone mineral density (BMD) and hypercalcemia.

Methods: Consecutive 191 normocalciuric (24-hour urinary calcium<400 mg/day) patients with PHPT (51±13 years, F/M:155/36), 61 hypercalciuric (24-hour urinary calcium>400 mg/day) patients with PHPT (49±10 years, F/M:50/11) and 55 healthy controls (38±10, F/M:43/12) were included in the current study. Serum calcium, phosphorus, parathyroid hormone (PTH), 25(OH) vitamin D and 24-hour urinary calcium were measured in all three groups. DEXA method was used for BMD measurement.

Results: Serum calcium levels were 11.8±0.9 mg/dl, 10.6±1.3 mg/dl and 9.6±0.3 mg/dl (p<0.0001), serum parathyroid hormone levels were 287±378.2 pg/ml, 212±322 pg/ml and 61.3±28 pg/ml (p<0.001) for hypercalcemic, normocalciuric patients and control group respectively. 24-hour urinary calcium levels were 600±173 mg/day in hypercalcemic group, 196±106 mg/day in normocalciuric group and 137±69 in healthy controls group (p<0.0001). Serum calcium levels were observed significantly higher and serum phosphorus levels were observed significantly lower in hypercalcemic group compared to normocalciuric group and healthy control group (p<0.0001, p=0.005). Serum PTH levels were observed significantly higher in hypercalcemic group compared to normocalciuric group (p=0.03). 24-hour urinary calcium levels showed positive correlation with PTH and serum calcium levels (r=0.37, r=0.47, p<0.0001) and negative correlation with femur neck and lomb BMD levels in PHPT patients. (r=0.23, p=0.001; r=0.27, p=0.02). Patients whose serum calcium levels were normal or mildly elevated were tested for CGR mutation and it resulted negative.

Conclusion: Our study also showed that there is positive correlation between urinary calcium levels and serum PTH levels in newly diagnosed PHPT patients. It also supports the opinion that hypercalcemia could be a marker bone loss in PHPT patients.