A Clinical Correlative Study of Bone Densitometric Changes in Hemodialysis Patients with Hyperparathyroidism

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Dear Sir,

As the survival of patients with end-stage renal disease has been prolonged by modern dialysis therapies, uremic bone disease (UBD) has become a common and incapacitating disorder among hemodialysis patients [1]. Despite several diagnostic techniques such as bone changes measured radiologically, bone histomorphometric studies with double tetracycline labelling, quantitative computerized tomography, and biochemical parameters (osteocalcin, alkaline phosphatase, parathyroid hormone, PTH) have been considered in the assessment and monitoring of bone damage of UBD, absence of a precise method still poses a problem in both diagnosis and monitoring of UBD [2, 3]. In recent years a new noninvasive method, determination of bone mineral density by dual energy X-ray bone densitometer, has been increasingly employed in the assessment of UBD [4-6]. In this study, we evaluated the possible correlation between serum PTH levels and bone densitometric changes in patients on regular hemodialysis.

We studied 15 hemodialysis patients. Serum calcium, serum phosphorus and intact PTH levels were determined before midweek dialysis. Intact PTH was measured by solid-phase, two-site chemiluminescent enzyme immunometric assay (Diagnostic Product Corporation, Los Angeles, Calif.). A dual-energy X-ray bone densitometer (Model XR-36, Norland Corporation, Wisc., USA) with a samarium filter producing two energy peaks at 46.8 and 80 kV was used to measure bone mineral density (BMD). Re-

Table 1. Clinical data and mean biochemical values (mean SD) in hemodialysis patients

37.2 ± 11.7

73.7 ± 51.4

8.6 ± 0.8 5.4 ± 1.1

418 ± 411 (N: 12-73) 440 ± 329 (N: 98-279)

Age, years
Hemodialysis duration, months
Serum calcium, mg/dl
Serum phosphorus, mg/dl
PTH, ng/ml
Alkaline phosphatase, u/l
N = Normal.

Table 2. Mean BMD values (g/cm²) and Pearson's correlation coefficients between BMD values and PTH levels

the clinical data and mean biochemical values in the patients participating in the study and table 2 shows the determined mean BMD values of the patients and Pearson's coefficients of correlation between BMD values and PTH levels.

Regional BMD values were obtained for the lumbar spine [L3 (BMD0), L2-L3 (BMD2)], for proximal portions of both femurs [femoral neck (BMD3), femoral trochanter (BMD4), Ward's triangle (BMD5)]. Right/left average values of femoral measurements were taken for the analysis. Table 1 shows

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As indicated in table 2, we could find no significant correlation between PTH levels and BMD values in hemodialysis patients, so the possible pathogenetic factors other than PTH considered in the pathogenesis of UBD must contribute to the formation of bone changes measured by dual-energy X-ray bone densitometer in hemodialysis patients.

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