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Biochemical markers of mineral bone disorder in patient on maintenance hemodialysis

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Background: Despite the high mortality and morbidity associated with abnormalities in mineral and bone metabolism in hemodialysis patients, there are limited data on the pattern of mineral bone disorder in African CKD populations. Therefore, the purpose of this study was to describe the pattern of mineral bone disease by evaluating biochemical parameters in patients on maintenance hemodialysis (MHD).

Methods: We evaluated the serum/plasma intact parathyroid hormone (iPTH), corrected calcium, phosphate, total alkaline phosphatase (TALP) and 25 -OH vitamin D levels of two hundred and five patients undergoing MHD at two dialysis centers in Johannesburg.

Results: The MHD patients (133 men, 72 women) had a mean age of 54.2 ± 15.3 years with a median dialysis vintage of 24 months (IQR, 12-48) and a mean kt/v (single pool) of 1.4 ± 0.3 . The prevalence of hyperparathyroidism (iPTH > 150 pg/mL (measured by the Elecsys chemoluminescent assay, Roche), hyperphosphataemia, hypocalcaemia and 25-OH vitamin D deficiency (< 30 ng/mL) was 72.1%, 54.1%, 20.4% and 80.1 % respectively. There was a positive correlation between iPTH and TALP ($r=0.22$, $P=0.007$). The combination of markers of bone turnover (iPTH > 150 and TALP > 110 U/L) suggestive of high turnover bone disease, was present in 46.8 % of the study population. In multiple regression analysis, the odds ratio for developing hyperparathyroidism with hypocalcaemia and hyperphosphataemia were 4.7 (95% CI 1.0 - 22.3, $P=0.04$) and 2.9 (95 % CI 1.4 - 6.4, $P=0.005$) respectively. 48.7 % of MHD patients had iPTH within the recommended KDIGO guidelines.

Conclusion: Secondary hyperparathyroidism and 25 -OH vitamin D deficiency were common in our hemodialysis patients. Hypocalcaemia and hyperphosphatemia were strong predictors for developing secondary hyperparathyroidism.

Biography

Bala Waziri is a PhD student in Nephrology at the University of the Witwatersrand. He has received his MBBS in 2002 from one of the prestigious Universities in Nigeria (Ahmadu Bello University Zaria). He obtained his fellowship certificate in Nephrology from the Nigerian National Postgraduate College. For his PhD dissertation, he is currently working on biochemical and genetic markers of mineral bone disease in chronic kidney disease patients.

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