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Background: Increased fracture rates are observed in renal transplant recipients compared with the general population. Risk factors include age, diabetes, dialysis vintage, immunosuppression, and bone and mineral abnormalities. Low serum phosphorus levels occur post-transplantation; however, its relationship with fracture risk has not been evaluated.

Aim: To evaluate risk factors for fracture in renal transplant recipients at a single tertiary referral centre.

Method: A retrospective cross-sectional analysis of 146 patients (75M, 71F) who had been referred for Dual energy X-ray densitometry (DXA) post-renal transplantation was performed. Aetiology of end stage renal disease (ESRD), duration of dialysis, parathyroidectomy history, immunosuppression regimen, DXA parameters, biochemistry and fractures were documented from medical records/radiological reports. Statistical analyses included univariate and multivariate regression.

Results: Mean age of patients at time of DXA was 54 (± 12) years, with a mean time post-transplantation of 6.7 (± 5.5) years. The most common cause of ESRD was glomerulonephritis (38%); 86% of patients were on long-term prednisolone and 7% had had a parathyroidectomy. In post-menopausal women and all men, T-scores were osteopenic or osteoporotic at the femoral neck (FN), lumbar spine (LS) and total body (TB) in 75%, 37% and 49% respectively. Premenopausal women had Z scores ≤ -2 at the FN, LS and TB in 19%, 15% and 8% respectively. 79 fractures occurred in 53 patients (36%), with 40 fractures occurring post-transplantation. Ankle/foot fractures were most common (48%). Declining femoral neck areal bone mineral density (FN aBMD), FN T score and serum phosphorus were associated with fractures in both univariate and multivariate regression analyses after adjusting for age, gender, weight, renal function and pre-transplant history of fracture (p=0.045, p=0.042 and p=0.011 respectively). The relationship between serum phosphorus and fracture remained significant independent of any BMD parameter, parathyroid hormone levels, parathyroidectomy status and prednisolone use.

Conclusion: Fracture is common post-renal transplantation, as is osteopenia/osteoporosis at the FN and TB. Declining FN aBMD, FN T score and lower serum phosphorus levels are associated with fractures. This previously unreported observation requires further evaluation in prospective studies.