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Factors associated with low trabecular bone scores in patients with end-stage renal disease

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Objectives: The trabecular bone score (TBS) is a textural index that indirectly assesses bone trabecular microarchitecture using lumbar spine images obtained by dual energy x-ray absorptiometry (DXA). This study compared the TBS of patients with end-stage renal disease (ESRD) with that of matched controls to identify risk factors associated with a low TBS.

Methods: TBS and bone mineral density (BMD) were assessed in ESRD patients (n=76) and age- and sex-matched control subjects (n=76) using DXA. The TBS of both groups was then compared, and risk factors associated with a low TBS (defined as ≤1.31) were evaluated.

Results: The mean TBS in the ESRD group was significantly lower than that in the control group (1.34±0.15 *vs.* 1.43±0.08, respectively; $p<0.001$). More subjects in the ESRD group had a low TBS (34.2% (ESRD) *vs.* 5.3% (controls); $p<0.001$). The TBS was negatively correlated with age, alkaline phosphatase and C-reactive protein levels, and dialysis vintage, and positively correlated with BMD at the lumbar spine, femoral neck, and hip. Multivariate analysis identified lower estimated glomerular filtration rate and increased C-reactive protein levels as being significantly associated with a low TBS.

Conclusions: ESRD patients had abnormal bone microarchitecture as assessed by the TBS. The TBS was positively correlated with BMD. Renal function and inflammatory marker levels were independently associated with a low TBS. Thus, TBS may be a useful clinical tool for assessing poor bone quality in ESRD patients.