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OSTEOPOROSIS IN HEMODIALYSIS PATIENTS REVISITED BY BONE HISTOMORPHOMETRY: A NEW INSIGHT INTO AN OLD PROBLEM.

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Background: Osteoporosis in hemodialysis patients is associated with high morbidity and mortality and, although extensively studied by noninvasive methods, has never been assessed through bone biopsy. The aim of this study was to use histomorphometry to evaluate osteoporosis and identify factors related to its development in hemodialysis patients.

Method: We conducted a cross-sectional study involving 98 patients (35 females and 63 males; mean age: 48.4 ± 13 years) on hemodialysis for 36.9 ± 24.7 months. Patients were submitted to transiliac bone biopsy with double tetracycline labeling. The bone metabolism factors ionized calcium, phosphorus, bone alkaline phosphatase, deoxypyridinoline, intact parathyroid hormone and 25(OH) vitamin D were evaluated, as were the bone remodeling cytokines osteoprotegerin (OPG), soluble receptor-activator of NF- κ B ligand (sRANKL), and TNF α . Osteoporosis was defined as trabecular bone volume (BV/TV) more than 1 SD below normal (males < 17.4%; females < 14.7%).

Results: Forty-five (46%) patients presented osteoporosis, which was correlated with white race. We found BV/TV to correlate with age, body mass index (BMI), OPG/sRANKL ratio, TNF α levels and length of amenorrhea. In multiple regression analysis, age, BMI, white race and OPG/sRANKL ratio were independent determinants of BV/TV. Histomorphometric analysis demonstrated that osteoporotic patients had normal eroded surface and low bone formation rate.

Conclusion: Osteoporosis is prevalent in hemodialysis patients. Low bone formation rate could be involved in its development, even when bone resorption is normal. Cytokines may also play a role, as may traditional risk factors such as advanced age, lower BMI, hypogonadism and being of the white race.