

Should We Rely on DEXA Scanning to Assess for Potential for Fragility Fracture?

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Purpose: Identification of patients with low bone density at risk for fragility fracture is of great concern. The current imaging standard for osteoporosis evaluation is dual-energy X-ray absorptiometry (DEXA). This study aimed to assess the DEXA T-score's ability to accurately identify patients at risk for fragility hip fractures and to determine if other modifiable patient characteristics should be used to evaluate patients for osteoporosis in the clinical setting.

Methods: We included all patients who presented to 1 academic medical center between September 2016 and September 2018 with a hip fracture and were referred for bone health evaluation as part of the Hospital's "Own the Bone" program. Of this group, we identified those who received a DEXA scan within 2 weeks of their hip fracture. Patients were divided into 2 cohorts: osteoporotic (DEXA T-score: <-2.50) and nonosteoporotic (DEXA T-score ≥ -2.5). These 2 cohorts were then evaluated for age, body mass index (BMI), baseline ambulatory status, assistive device use prior to their hip fracture, Charlson Comorbidity Index (CCI), and marital status using independent samples t tests. A binomial regression was performed to determine if any modifiable patient characteristics were predictive of a diagnosis of osteoporosis.

Results: Of the 80 patients who met inclusion criteria, 80 had AP spine DEXA T-scores, 70 had right or left femoral neck DEXA T-scores, and 68 had right or left total hip DEXA T-scores. 47.5% of patients (38) evaluated had osteoporosis on at least 1 scan and were assigned to an "osteoporotic" cohort and 52.5% (42) had no scans positive for osteoporosis and were considered "nonosteoporotic." Older patients (79.7 ± 12.0 vs 74.2 ± 11.9 , $P = 0.044$) and lower BMI (23.8 ± 3.8 vs 27.2 ± 8.9 kg/m², $P = 0.036$) were associated with a positive DEXA and thus a diagnosis of osteoporosis. CCI, baseline ambulatory ability, use of assistive device prior to hip fracture, sex, and marital status (39.5% vs 40.5% , $P = 0.555$) were not associated. Binomial regression controlling for age and CCI revealed BMI to be predictive of a diagnosis of osteoporosis, $P = 0.047$. For each 1 kg/m² BMI decrease, the odds of having osteoporosis increased by 1.12 times. Further subanalysis revealed that a cohort of "obese" and "severely obese" patients, defined as BMI 30.0 to 39.9 kg/m², were less likely to have osteoporosis when compared to a cohort of "normal" and "overweight" patients, defined as BMI 18.5 to 29.9 kg/m² (16.7% vs 54.8% , $P = 0.016$).

Conclusion: Our study suggests that of all hip fracture patients, less than half would be considered osteoporotic by DEXA T-score standards. Thus, DEXA scan results alone are inadequate to identify patients who are at risk for a fragility fracture. Additionally, a patient with a BMI within the normal to overweight range (18.5 to 29.9 kg/m²) is more likely to have osteoporosis than a patient who has a BMI considered obese to severely obese (30.0 to 39.9 kg/m²) and these patients should receive additional counseling on bone health.