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AREA- AND VOLUME-BASED QCT REFERENCE DATA FOR THE PROXIMAL FEMUR

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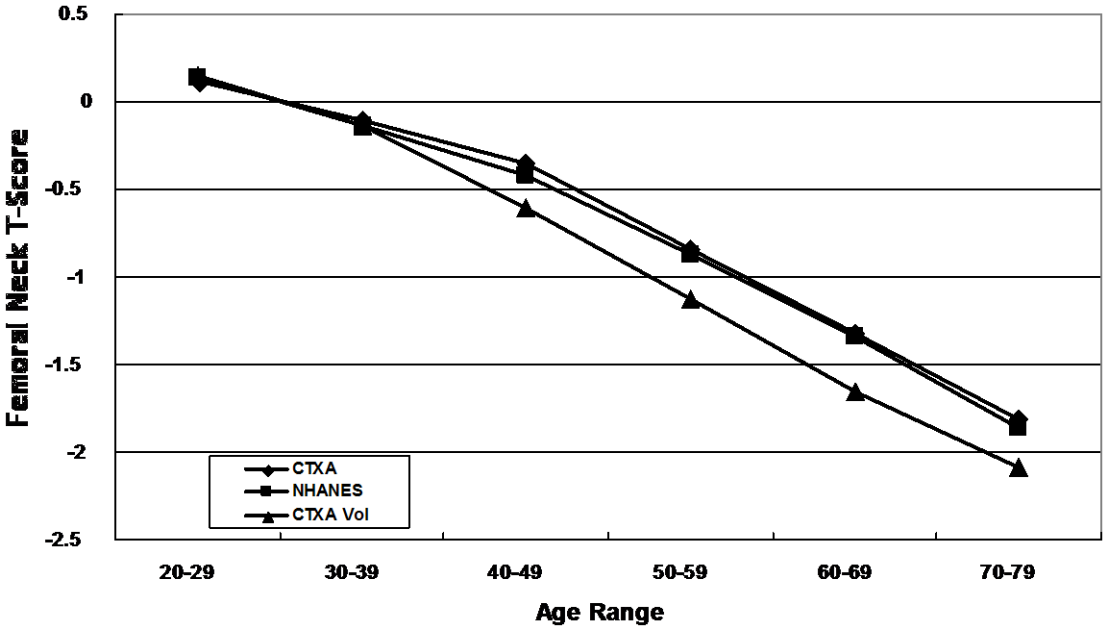
Objective(s): Bone mineral density (BMD) estimates for the proximal femur using DXA are currently considered standard for diagnosing osteoporosis in patients using BMD alone. The WHO reference standard for osteoporosis diagnosis is a T-score of -2.5 or less at the femoral neck. QCT produces DXA-equivalent "CTXA" areal BMD measurements at the proximal femur, but normal reference values are required to calculate a T-Score. We have developed a normal reference BMD database for US Caucasian women for use with the QCT CTXA Hip software (Mindways Software, Inc., Austin, TX) and compared it to NHANES III DXA data.

Material and Methods: Our prospective cohort included 616 women aged 20-79 from 11 centers distributed across three U.S. regions: 3 Pacific, 4 Midwest, and 4 Northeast. CT images were analyzed with the CTXA Hip software. QCT data was analyzed in a DXA-like format using the standard femoral neck, trochanter, intertrochanter and total hip regions of interest. Both area-based and volume-based data are presented for these regions of interest. T-scores were calculated for CTXA Hip and NHANES III data sets based on age 20-39 reference.

Results: There were no statistically significant differences between measurements from different CT scanners. We found no significant variation across centers, regions or ages in Body Mass Index by ANOVA (alpha=0.05). The young reference means (±st.dev.) from the pooled age 20-39 data were 0.922±0.116 g/cm2 for Total Hip, 0.795±0.111 g/cm2 Femoral Neck, 0.698±0.103 g/cm2 Trochanter, and 1.096±0.137 g/cm2 Intertrochanter. The figure shows T-scores for Femoral Neck regions calculated using CTXA Hip areal BMD, volumetric BMD data and NHANES III data.



Conclusion(s): Area-based T-scores based on the reference data presented here are virtually identical to those obtained from the published NHANES III data, indicating this method can be used with WHO DXA T-score guidelines to provide substantially the same clinical information at the femoral neck as DXA.