Discrimination of Proximal Hip Fracture by Quantitative Ultrasound Measurement at the Radius

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Osteoporosis is a disease that culminates with fragility fractures and, therefore, imposes a major burden on health economy. In dealing with this worldwide condition, it is prudent to use a reliable, non-expensive, portable diagnostic means that does not use ionizing radiation and is capable of measuring bone properties at several sites. Recently, a quantitative ultrasound device (Omnisense) that measures speed of sound (SOS) at multiple skeletal sites was introduced. The Omnisense combines the "axial transmission" mode and the critical angle concept. Preliminary reports suggested that out of the different skeletal sites measured by this device, the distal third of the radius is the preferred measurement-site for osteoporosis. In this cross-sectional study, SOS was determined at the radius using Omnisense in 50 hip fractured elderly women (Group F, age 76.1?6.0), 130 elderly controls (Group NF, age 71.5?5.2) and 185 young healthy controls (Group YH, age 40.6?3.0). Actual SOS was significantly lower in Group F as compared with Group NF (p=0.0001).
Whereas SOS T-scores calculated for each woman and stratified into age sub-groups within each of the study groups indicate a decline from -2.22 to -3.56 in Group F and from -1.56 to -3.17 in Group NF, it increased from -0.02 to 0.03 in Group YH. Age- and BMI-adjusted logistic regression for hip-fracture discrimination indicated area under the ROC curve for hip fracture of 0.79 (95% CI, 0.73-0.86, p=0.005) and an odds ratio of 1.92 (95% CI, 1.22-3.02, p=0.005). We conclude that SOS measured at the radius by Omnisense discriminates subjects with hip fracture from controls. Prospective studies are needed in order to support the role of Omnisense in assessing the risk of hip fracture.

Published in: ***Osteoporosis International****, 2000, 11:411-416*