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

Omnisense demonstrates its ability to assess hip fracture risk of subjects by speed of sound measurements at the radius.

Introduction

Osteoporosis is a disease that culminates with fragility fractures and imposes a major burden on health care costs. In dealing with this worldwide condition, it is prudent to use a reliable, non-expensive, portable diagnostic device that does not use ionizing radiation and is capable of measuring bone properties at several sites. Sunlight Omnisense 7000S, a quantitative ultrasound device which measures the speed of sound (SOS) along the bone at multiple skeletal sites, provides such a solution.

Study Design

The study was designed to evaluate the ability of the Omnisense to assess fracture risk.
Three groups of women were recruited for this cross-sectional study:
- Elderly women with osteoporotic proximal hip fractures
- Elderly women without any evidence of osteoporotic fractures
- Young, healthy women

Speed of Sound measurements were performed at the distal 1/3 of the radius.

Results

SOS was found to be significantly lower in the fractured group than in the non-fractured group. Hip fracture subjects had a mean speed of sound (SOS) of 3861±149 m/s, while non-fracture subjects had a mean SOS of 3966±145 m/s. Thus, there was a difference of 105 m/s between the two groups (t-test p<0.0001). A low SOS is an indication of unhealthy bone and increased fracture risk (ROC curves indicate an AUC of 0.79 (95% CI, 0.73 - 0.86)). Assessment of fracture risk can presented by odds ratio (OR). In this study, OR was 2.16 (95% CI, 1.46 - 3.19). This analysis shows that for every 100 m/s decrease in SOS the odds of fracture increase by about 50% and that for every decrease of 162 m/s in SOS the odds of fracture double.

T-Score Discrimination by Age
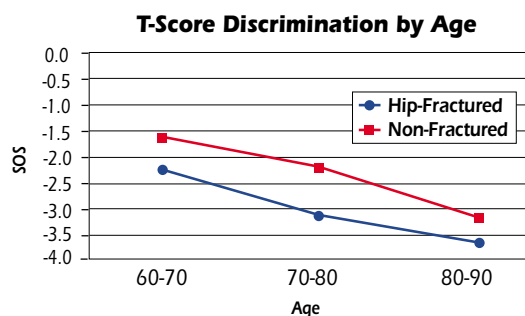
Conclusion ▶▶

SOS, as measured by the Omnisense, can be considered an important factor in aiding the physician when diagnosing a patient for osteoporosis and determining the patient's risk of fracture.

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