THE PREDICTIVE ABILITY OF TWO QUANTITATIVE ULTRASOUND BONE SCANNERS IN COMPARISON TO DXA.

Richard Cook (1), David Collins (2), Julie Tucker (3), Peter Zioupos (1)

1. Department of Materials and Medical Sciences, Cranfield University, Shrivenham, UK
2. Rheumatology Dept, The Great Western Hospital (GWH), Swindon, UK
3. Radiography Dept, The Great Western Hospital (GWH), Swindon, UK

INTRODUCTION

Ultrasound measurement of bone has become a recognized method of screening patients at risk of osteoporosis. The Sunlight Omnisence (Sunlight Medical, Rehovot, Israel) and the CUBA Clinical (McCue plc. Winchester, UK) are two such ultrasound screening tools.

The ultrasound scanners, both use the T-Score method of classification of Osteoporosis as laid out by the World Health Organization, (Kanis et al. 1994), which allows for direct comparison of bone status at different measurement sites. Dual-energy x-ray Absorptiometry (DXA) is viewed as the gold standard for bone densitometry measurement, and supplies value of bone mineral density (BMD).

The aim of this study was to assess the ability of the two ultrasound scanners to differentiate patients with confirmed osteoporosis and osteopenia at the spine and hip.

MATERIALS AND METHODS

265 women [aged 28-87, mean age 57.5] were recruited from DXA scanning sessions, at GWH, Swindon. The patients received a DXA scan, followed by paired measurements on the two-ultrasound machines. 19 patients were excluded from the analysis of results due to incomplete sets of scans.

The hip and spine BMD investigations were examined. Two T-Score levels were used to identify patients with low BMD: T-scores of either –1 or –1.5. Two cut off levels were used to assess the potential of the ultrasound machines to detect low BMD, an ultrasound T-Score of –1 and –0.5.

RESULTS

The hip and spine BMD T-score of –1, classified 97, and 144 of the 246 patients as having low bone density at the hip, and spine respectively. The hip and spine BMD T-score of –1.5, classified 60, and 115 of the 246 patients as having low bone density at the hip, and spine respectively.

(i) Using the –0.5 ultrasound T-score cut off, and the –1 BMD T-score to denote low bone density: Combining all three Sunlight measurements, 17 women with low total hip BMD, and 24 women with low spine BMD, would still be classified as normal. The CUBA Clinical BUA, using the same cut off points incorrectly identified 8 women with low spine BMD, but identified correctly all women with low hip BMD. (ii) Using the –0.5 ultrasound T-score cut off, and the –1.5 BMD T-score to denote low bone density: Combining all three Sunlight measurements, 8 women with low total hip BMD, and 24 women with low spine BMD, would be classified as normal. The CUBA Clinical BUA, using the same cut off points incorrectly identified 3 women with low spine BMD, but identified all women with low hip BMD correctly.

The results show that the specificity of the Sunlight Omnisence to pick up patients with osteoporosis and osteopenia is relatively poor.

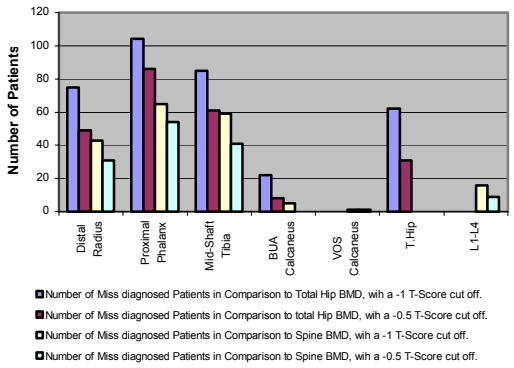

Figure 1: Graph to show the number of patients incorrectly diagnosed as normal.

CONCLUSIONS

Care should be taken when using ultrasound as an alternative to DXA diagnostic tool to ensure that patients with low hip and spine BMD are not incorrectly diagnosed in the screening process.

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REFERENCES.

Kanis et al. J. Bone Miner Res, 9:1137-1141, 1994.