

The Comparison of Bone Mineral Density measured between Quantitative Ultrasound and Dual-Energy X-ray Absorptiometry

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Abstract

Dual-energy X-ray absorptiometry (DXA) is a gold standard method for bone density assessment regarded to World Health Organization (WHO) because of its high reliability and precision. However, the disadvantages of DXA are unwidely available, expensive and importable. Therefore, Quantitative Ultrasound (QUS) has been introduced as an alternative technology to bone densitometry. Due to the low cost, portability and no ionizing radiation. So, the aim of this study was to determined the correction factor of QUS (ALOKA AOS-100SA, Hitashi, Japan) by calibrated with bone mineral density (BMD) using DXA (GE Lunar Prodigy)

The 39 volunteers were measured the BMD value at the hip and L-spine by DXA, then they were measured by QUS at the calcaneus with in 5 minutes after finished measurement by DXA. The percentage different between DXA and QUS were calculate for all volunteers. An average correction factor from 39 volunteers were also determined The result showed the BMD value different between QUS and DXA were about -15.385 – 49.763. The calculated correction factor, L-spine and hip, were 1.244 and 0.873 respectively. As expected, the different between QUS and DXA was decreased when applied the correction factors. Therefore, we considered the QUS as an alternative method for measure the BMD value which can provided a similar result to DXA gold standard.

Keywords : Quantitative ultrasound, Dual energy X-ray absorptiometry, Bone mineral density

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