Prediction of bone mineral density of lumbar spine, hip, femoral neck and Ward's triangle by forearm bone mineral density

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Abstract

Bone mineral density (BMD) of dual energy X-ray absorptiometry (DEXA) at both radius and ulna were measured to evaluate the correlation of those and BMD at lumbar (L) spine, hip, femoral neck and Ward's triangle. The 64 simple linear regression analysis was calculated to postulate the predicted equation by using the BMD at supradistal, distal 1/10, distal 1/6 and distal 1/3 of both forearms as independent variables, while the dependent variables were BMD at L1-L4 spine, total hip, femoral neck and Ward's triangle. 115 patients aged between 41-79 years (mean age 55.97±8.34 years) from the menopausal clinic, Pramongkutklao Hospital, were scanned at both forearms by Panasonic (DXA-70) DEXA and at non forearm regions by Hologic (QDR 4500) DEXA on the same day. The results showed that the BMD of each of the 4 parts of both radius and ulna had positive correlation to those of L-spine, total hip, femoral neck and Ward's triangle with r = 0.4012 to 0.7032 (P<0.001 for all). The greater distal of the forearm, the better correlation of BMD to the non forearm BMD. The 64 simple linear regression equations were constructed with regression coefficient ranging from 0.6048 to 1.9011 (P<0.001 for all). When considering the non forearm BMD, the mean BMD at Ward's triangle significantly declined more rapidly than that of L-spine, total hip and femoral neck (P<0.05 for all). It indicated that there was an early change of BMD at Ward's triangle. However, this change followed the forearm BMD. Distal forearm BMD was the earliest sign of bone loss. We can predict non forearm BMD by supradistal and distal 1/10 of forearm BMD.

Keywords : Bone Density; Prediction

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