

Correlation between DXL and DXA in assessment of bone structure in patients using Levothyroxine

Hafezi R.A. (M.D.)¹, Hamidi Z. (M.D.)², Soltani A. (M.D.)³, Keshtkar A.A. (M.D.)^{2,4}.

1- Assistant Professor, Department of Physiotherapy, Faculty of Medicine, Baghiat-allah University of Medical Sciences, Tehran, Iran.

2- General Physician, Endocrinology and Metabolism Research Center (EMRC), Tehran University of Medical Sciences, Tehran, Iran.

3- Assistant Professor, Endocrinology and Metabolism Research Center (EMRC), Tehran University of Medical Sciences, Tehran, Iran.

4- Ph.D. Candidate, Tehran University of Medical Sciences, Tehran, Iran.

Abstract

Introduction: Many patients using Levothyroxine, have osteopenia or even osteoporosis by the definition of the World Health Organization based on bone mineral density (BMD). Dual-energy X-ray absorptiometry (DXA) of femur and spine, the standard method for diagnosis of osteoporosis, needs nonportable devices that are not available everywhere. DXL (DXA of calcaneus) is a mobile and less expensive method for assessing the bone. There is little data about this method's correlation with DXA in patients using Levothyroxine. The present study assessed the value of DXL in detecting changes in bone structure in these patients compared with DXA.

Materials and Methods: In a cross-sectional analysis, 62 patients (4 men) with a mean age of 53.32 ± 10.54 years, were studied. A GE-Lunar device (DPX-MD) used for DXA of the hip (neck and total) and spine. DXA of the calcaneus measured using a Demeteck device. SPSS (10) was used for statistical analysis. Sensitivity and specificity of DXL method were measured with ROC curve. P- Value less than 0.05 were considered significant.

Results: The mean age of patients was 53.32 ± 10.54 years. Osteoporosis found in 18% of patients in any of the total of femur or L2-L4 regions (6% in total region, 16% in L2-L4 regions). Using DXL, osteoporosis diagnosed in 18% of patients. Using ROC curve, sensitivities of T-score ≤ -2.5 of calcaneus for diagnosing of osteoporosis in total of hip and L2-L4 regions were respectively 75% and 60% and specificities were respectively 88.2% and 90.2%. Area under curve of total and spine regions were 0.975 (P-value=0.002), 0.866 (P-value=0.000), respectively.

Conclusion: DXL (DXA of calcaneus) can be recommended for screening of osteoporosis among Levothyroxine user patients. Those suspected of osteoporosis, should be examined by additional DXA measurement for establishment of diagnosis before initiation of therapy.

Key Words: Osteoporosis, BMD, DXA, DXL, and Levothyroxine.

Corresponding Address: Dr. Soltani A., Endocrinology and Metabolism Research Center (EMRC), Fifth floor, Shariati Hospital, North Garegar Street, Tehran, Iran.

E mail: emrc@sina.tums.ac.ir