RADIOFREQUENCY ECHOCOGRAPHIC MULTISPECTROMETRY COMPARED WITH DUAL X-RAY ABSORPTIOMETRY FOR OSTEOPOROSIS DIAGNOSIS ON LUMBAR SPINE AND FEMORAL NECK IN A COLOMBIAN POPULATION

Keywords: Osteoporosis, Diagnostic tests

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Background: An innovative non-ionizing ultrasound technique for osteoporosis diagnosis, which directly measures the BMD (Bone Mineral Density) of both the lumbar spine and the femoral neck, REMS, has shown significant correlations with BMD values and good levels of concordance with DXA-based diagnoses.

Objectives: Cross-sectional study to establish the concordance of BMD measurement between REMS and the gold standard (DXA) in Colombian adult patients receiving oral steroids.

Methods: Observational, analytical and descriptive, cross-sectional study in adults of both sexes who receive steroids and who attend a rheumatology center in Bogotá-Colombia. Inclusion criteria: Men and women over 18 years. Receiving steroids more than 2.5 mg of prednisone or its equivalent for 3 or more continuous months. Interpretable bone densitometry. Subjects who accepted their participation in the study and signed the informed consent. Exclusion criteria: History of pregnancy implantation in the abdomen and/or buttocks. Known physical deformities and/or previous lumbar spine surgery and/or bilateral hip replacement. Pregnant women. Subjects prevented from performing bone densitometry. The densitometric measurements were made with a compact high-performance equipment from General Electric, model DXA, by the same technologist at the skeletal sites of interest. In a second moment, the same trained technologist performed the BMD measurement using REMS, using an EchoS machine (Echolight®), equipped with a 3.5 MHz convex transducer. This study was submitted and approved by the institutional ethics committee. The calculation of the sample size was carried out with the prevalence of osteoporosis induced by steroids, for n = 185 individuals. The concordance between the two technologies was evaluated with the weighted Cohen’s Kappa index.

Results: 200 patients were included in the study, 162 were women. The median age of the entire cohort was 50 years (IQR: 22), with a minimum age of 20 and a maximum of 86 years. In women, the median age at menarche was 13 years (IQR: 2) and the median age for menopause was 47 years (IQR: 8), only 2.50% (n = 5) reported having fractures for fragility. 51% of the patients had rheumatoid arthritis, SLE 29% and other diagnoses 20%. Regarding the type of corticosteroid used, 92.5% received prednisolone. The last dose of corticosteroid used in median was 1825 mg/y (IQR: 2). In the case of the accumulated dose in the last year, the median was 1825 mg/y (IQR: 1850). For the concordance analysis, 11 patients were excluded because the image of all the lumbar vertebral bodies could not be interpreted with both DXA and REMS techniques. Taking into account the diagnostic classification of each technology, a diagnostic concordance was obtained with the weighted Cohen’s Kappa index of κ = 0.72 (95%CI: [0.63; 0.81]) in the lumbar spine and κ = 0.65 (95%CI: [0.54; 0.74]) in femoral neck.

Conclusion: In Colombian patients receiving steroids, the diagnostic concordance for BMD measurement between DXA and REMS is good; however, there are factors that affect the measurement, for which further training in REMS is required for the technologist to mitigate errors and improve the concordance between the techniques.

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AB1229 COMPARISON OF FRACTURE RISK BY FRAX WITH AND WITHOUT BONE MINERAL DENSITY IN PATIENTS WITH RHEUMATIC DISEASES

Keywords: Prognostic factors, Osteoporosis, Non-pharmacological interventions

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Background: FRAX is a well-validated instrument that calculates the probability of a major osteoporotic fracture over the following 10 years based on a set of risk factors such as age, body mass index (BMI), history of fragility fracture, steroid treatments used in patients with autoimmune rheumatic diseases (ARD) such as rheumatoid arthritis (RA), and secondary osteoporosis [1]. The FRAX score obtained without bone mineral density (BMD) is comparable to the fracture risk calculated using BMD values; it aims to identify patients who are likely to benefit from health interventions [2].

Objectives: To compare the fracture risk using FRAX with and without BMD in patients with ARD.

Methods: An observational, cross-sectional, prospective study was carried out at the Rheumatology Clinic in the University Hospital “Dr. José Eleuterio González” in Monterrey, Mexico from September to December 2022. We included >40 years old ARD patients with a previous BMD test who were evaluated as part of a “Bone Health Program”.

Results: A total of 146 patients included were: 142 (97.3%) were women and 4 (2.7%) were men with a mean age of 61.49 ± 9.22. The most frequent BMI was overweight (43.2%), followed by normal (31.5%), obesity grade 1 (13.7%), obesity grade 2 (10.3%) and obesity grade 3 (1.4%). The occupations were housewife (78.8%), employed (17.1%) and owned business (4.1%). The most prevalent main diagnosis was RA (45.9%) followed by osteoporosis (24.7%), osteoarthritis (14.4%), systemic lupus erythematosus (3.4%), Sjogren’s syndrome (2.7%) and others (8.9%). The risk factors used by FRAX can be found in Table 1. According to the non-traditional risk factors, 24.7% suffered 2 or more falls in the last year, 26% had periodontal disease, 71.9% were sedentary and 53.8% had visual problems. The median T-score spine was -1.7 (IQR:-2.5) to -0.8) and the mean T-score hip was -1.06 ± 1.21. The risk fracture scores using FRAX with and without BMD are in Table 1.

Conclusion: Higher hip fracture and major fracture risks were identified in the FRAX without BMD. We found significant differences between the hip fracture risk of FRAX with and without BMD. Nevertheless, no differences were found in the major fracture risk of FRAX with and without BMD; this is of critical importance if all patients cannot have their BMD measured. The FRAX use makes it possible to offer a larger population a timely diagnosis.


Table 1. Fracture risk by FRAX with and without BMD and risk classification.

<table>
<thead>
<tr>
<th>Category</th>
<th>FRAX with BMD</th>
<th>FRAX without BMD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayor fracture risk, median, (IQR)</td>
<td>9.30 (6.07 - 15.0)</td>
<td>9.65 (6.60 - 17.0)</td>
<td>0.313</td>
</tr>
<tr>
<td>Hip fracture risk, median, (IQR)</td>
<td>1.10 (0.40 - 3.10)</td>
<td>1.95 (0.80 - 4.73)</td>
<td>0.002</td>
</tr>
</tbody>
</table>

IQR: Interquartile range

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Background: Osteoporosis is a generalized skeletal disease characterized by low bone density and alterations in bone microarchitecture. Current definitions and recommendations focus more on postmenopausal osteoporosis with a low number of studies in young pre-menopausal women, which makes it difficult to estimate the prevalence of osteoporosis in this population.

Objectives: To establish the prevalence and determine the etiologies of osteoporosis in young women and their management according to the experience of our department.

Methods: Retrospective descriptive and analytical study including 97 female patients aged less than 45 years, who performed a bone densitometry measurement between the years 2014 and 2022. Data were collected from the bone densitometry database. Osteoporosis was retained if a T score less than or equal to -2.5. Women older than 45 years and or followed for genetic osteopathy were excluded from this study.

Results: There were 97 patients with osteoporosis in this study. The average age was 25 years. Early menopause was found in 15% of cases (10% of cases after chemotherapy). Osteoporosis secondary to endocrinopathy was found in 17% of cases (5% diabetes, 10% primary hyperparathyroidism, 2% Cushing’s syndrome). It was secondary to a systemic disease or chronic inflammatory rheumatism in 45% of cases (29% rheumatoid arthritis, 12% spondyloarthropathy, 3% systemic lupus erythematosus and 1% Horton’s disease). The other pathologies found were chronic renal failure in 3% of cases, a notion of prolonged use of corticosteroids in 21% and hormone therapy for breast neoplasia in 14%. 3% of the patients had at least one osteoporotic vertebral fracture. The mean bone mineral density (BMD) in both femurs was 0.727/cm2. The mean BMD in the spine was 0.965/cm2. 11% of these patients were treated with oral anti-osteoporotic drugs, 35% were supplemented with vitamin D and calcium.

Conclusion: The discovery of osteoporosis is rare in young women, hence the scarcity of studies in this category of women. It may be of metabolic or drug-induced origin or related to other chronic inflammatory diseases. It should be investigated in the presence of risk factors in order to limit the risk of bone fractures.

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AB1232
HIGHER PAIN SCORE MEASURED WITH VISUAL ANALOG SCALE HAS SIGNIFICANT HIGHER RISK OF INCIDENT BONE FRAILITY FRACTURE

Keywords: Pain, Rheumatoid arthritis, Osteoporosis

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Background: Bone fragility fracture (BFF) is one of serious troublesome incident in treating patient with rheumatoid arthritis (RA). Previously, sustaining clinical remission with simplified disease activity index (SDAI) was clarified that prevents occurrence of incident BFF [1].

Objectives: We hypothesized that pain degree would correlates with occurrence of incident BFF, because that caused gait disability and bone fragility. The aim of this study is to clarify this issue.

Methods: A retrospective cohort study data was used in the study. Postmenopausal female patients who matched the EULAR/ACR classification criteria under the T2T since August 2010, have been treating RA and were measured bone mineral density (BMD) with dual-energy X-ray absorptiometry, were recruited. The initial target of therapy is the attainment of remission with simplified disease activity index (SDAI) score were included in RA specific candidate risks. Each evidence was evaluated. The ability to fall, and pain score using visual analog scale (VAS) were included, anti-citrullinated polypeptide antibodies and rheumatoid factor titers, SDAI score, Health Assessment Questionnaire Disability Index, and Sharp/van der Heijde score were included in RA specific candidate risks. Each evidence was evaluated using Cox regression analysis to identify significantly higher risk factors within 5% in univariate models and to evaluate using multivariate model. In the variants with significant higher risk ratio in the Cox regression analysis, Receiver