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AB0839

ASSOCIATION BETWEEN BODY FAT AND BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN THROUGH RADIOFREQUENCY ECHOGRAPHIC MULTI SPECTROMETRY

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Background: Osteoporosis is characterized by reduced bone mineral density (BMD) and increased fracture risk. Age, concomitant diseases, body mass index (BMI), body composition, etc. are important risk factors that could reflect on bone density and on the increased risk of fractures. Although obesity has been associated with increased bone mineral density (BMD) in the most studies, the relationship between body fat and BMD remains contradictory.

Objectives: The aim of this study is to determine if there is any association between body fat distribution and bone mineral density in postmenopausal women through novel ultrasound technique applicable on both lumbar spine and femoral neck.

Methods: A total of 98 women with mean age 62 ± 11 years underwent radiofrequency echographic multi spectrometry (REMS). Bioelectrical impedance analysis (BIA) software was used to assess body fat percentage. Patients were divided into two groups-with body fat $\geq 32\%$ and body fat $< 32\%$. Age, BMI, lumbar spine BMD, total hip BMD and fracture risk score (FRAX) were compared between the patients with normal body fat and those with high body fat.

Results: The mean age of the women with normal body fat was 61.1 ± 14.6 years and the mean age of the women with high body fat was 63.3 ± 9.5 years. BMI of the women with body fat $< 32\%$ was significantly lower (22.5 kg/cm^2) compared to the BMI of the women with body fat $\geq 32\%$ (30.2 kg/cm^2) ($p = 0.000$). Bone mineral density of L1-L4 and total lumbar spine BMD did not differ between the women with normal body fat and high body fat. Femoral neck BMD, trochanteric BMD and total hip BMD of the patients with normal body fat (0.604 g/cm^2 , 0.737 g/cm^2 and 0.736 g/cm^2 respectively) were significantly lower than those patients with high body fat (0.682 g/cm^2 , 0.864 g/cm^2 and 0.838 g/cm^2 respectively) ($p = 0.000$ for femoral neck BMD and trochanteric BMD, and $p = 0.001$ for total hip BMD). FRAX score for 10-year probability of major osteoporotic fracture did not differ significantly between the two groups (20.8% for women with normal body fat and 16.6% for women with high body fat). FRAX score for 10-year probability of hip fracture was also not significant between the two groups, but there was a trend to statistical significance ($p = 0.059$) (9% for women with normal fat and 4.9% for women with high fat).

Conclusion: Postmenopausal women with body fat $\geq 32\%$ showed higher femoral neck BMD compared to those with body fat $< 32\%$, but there was no significant difference in the lumbar spine BMD values between the groups. Women with high body fat did not show significantly lower FRAX score than the women with normal body fat.

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AB0840

SCREENING FOR OSTEOPOROSIS IN AN AMBULATORY AND HOSPITALIZED POPULATION: A 6-YEAR EXPERIENCE IN A UNIVERSITY HOSPITAL

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Background: Osteoporosis (OP) is a serious and prevalent disease identified by Dual Energy X-ray Absorptiometry (DEXA) that can be performed in an ambulatory or an hospitalized population.

Objectives: Aims are: (1) to characterize patients who had DEXA in a university department of rheumatology to study its diagnostic efficacy; (2) to look after risk factors specific to our population; (3) to evaluate the efficiency of a non-systematic and opportunistic intra-hospital OP screening by comparing results for ambulatory and hospitalized patients in the different departments of the hospital.

Methods: From 2007 to 2012, 6406 initial DEXA from consecutive patients were prospectively encoded (1494 in 2007, 1158 in 2008, 1079 in 2009, 945 in 2010, 868 in 2011 and 862 in 2012) (identical DEXA).

Results: Cohort characteristics are the following: women 74.4%, mean age (± 1 standard deviation) 60.5 years (± 14.3), mean BMI 25.1 (± 5.1), history of corticotherapy in 30.5%, previous fracture in 29% and current hospitalization in 28.8% of cases. OP (at one of the 3 sites) was diagnosed in 22.3%, a stable value over the years, with, as a repartition, lumbar spine, femoral neck and total hip OP in 13.7%, 13.6% and 9.2% respectively. In 3.9%, OP was diagnosed at all the 3 sites. In univariate analysis, OP risk factors were age, history of fracture and low BMI (for all 3 sites), corticotherapy (lumbar spine and femoral neck) and male gender (lumbar spine). In multivariate analysis, regardless of site, age, fracture history, low BMI, and male gender increased the OP risk.

Intra-hospital screening identified OP (at any of the 3 sites) in 31.8% (vs 18.5%, $p < 0.001$ for ambulatory screening) and OP at 3 sites simultaneously in 7.9% (vs 2.3%, $p < 0.0001$). This better efficiency was stable and present for each year analyzed. The intra-hospital population tested was older [64.2 years (13.2) vs 59 (13.2), $p < 0.0001$], with more men (35.2% vs 21.7, $p < 0.0001$), more history of fracture (39% vs 24, $p < 0.0001$) and with a slightly higher BMI [25.4 (5.8) vs 25.1 (4.8), $p = 0.028$], with no difference in corticosteroid use. In addition to T-scores analyzes, Z-scores were also compared and showed similar differences with lower Z-scores in the hospitalized population.

Conclusion:

- (1) One in five DEXA identified OP at one of the three sites in the ambulatory population but only one in three in the hospitalized patients. Hospital screening is therefore essential and more efficient than the ambulatory one. Hospital time seems to be an opportunity to fill the gaps in ambulatory screening.
- (2) Intra-hospital screening targeted an older and more masculine population with more fracture history, which may explain its better performance, which does not decline over the years. Z-score differences revealed that the efficiency difference was not only due to an older age of the hospitalized population but could be secondary to more interstitial co-morbidities or treatment deleterious for bones.
- (3) In addition to conventional ones, the male gender is a risk factor for OP, recalling the importance of screening for all and not only in the female population (which represents $\frac{3}{4}$ of the cohort).

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AB0841

PROSPECTIVE STUDY OF BONE METABOLISM AND FRACTURE INCIDENCE IN SPINAL CORD INJURY PATIENTS DURING A PERIOD OF 24 MONTHS

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Background: Spinal Cord Injury (SCI) produces a wide variety of changes in systemic physiology that can lead to several complications,

such as Osteopenia or even Osteoporosis. It has been reported in several studies, an incidence of fracture between 30-40% in this population.

Objectives: To evaluate the evolution of bone turnover biomarkers before and after treatment (according to 2015 NOF guidelines) and to describe the incidence of fracture after a SCI.

Methods: A prospective study was conducted, including 48 SCI patients followed during an observation period of 24 months, with visits every six months. Thirty two patients concluded the study. In each visit patients were enquired about fractures. A blood test was also performed. In addition a dual-energy x-ray absorptiometry (DEXA) and simple x-ray of hip and spine was requested annually. Patients were also educated in life-style measures, such as an adequate calcium and vitamin D dietary intake. Oral supplementation was initiated in cases of low intake or deficit, respectively. In patients with bone mineral density (BMD) measured by DEXA in range of Osteoporosis, pharmacological therapy was initiated (bisphosphonate or Denosumab). Statistics had been performed with mixed linear regression models.

Results: Our sample was 56.25% men with an average age of 56.08 ± 13.82 years old. In 32 patients (68.09%) low Vitamin D levels were detected. At baseline in 12 cases (25%) DEXA showed a BMD in osteoporosis range; in 12 (25%) osteopenia, plus 6 fractures (2.6 fractures per 100 years/patient). Afterwards, until the end of the study only a fracture of the tibia was observed (however, it was after a high impact accident), so the fracture rate was 1.2 fractures per 100 year/patient. The evolution of the variables can be seen on the next table.

	Month-0 N=48 Mean (SD)	Month-6 N=32 Mean (SD)	Month-12 N=36 Mean (SD)	Month-18 N=37 Mean (SD)	Month 24 N=32 Mean (SD)
CALCIUM (mg/dl)	9.1 (0.59)	9.53 (0.4)	9.37 (0.54)	9.46 (0.41)	9.55 (0.44)
PHOSPHOR (mg/dl)	3.63 (0.7)	3.42 (0.44)	3.32 (0.52)	3.33 (0.55)	3.25 (0.45)
VIT D (UI)	16.42 (9.95)	42.28 (18.93)	35.88 (13.53)	35.77 (18.08)	37.55 (15.06)
PTH (ng/mL)	38.15 (25.55)	36.09 (17.89)	38.33 (21.2)	40.1 (17.27)	43.35 (25.08)
PINP (ng/mL)	79.25 (80.9)	68.15 (35.77)	53.05 (45.76)	42.82 (24.26)	40.67 (25.17)
bCTX (ng/mL)	0.82 (0.49)	1.23 (4.22)	0.34 (0.35)	0.28 (0.21)	0.51 (1.36)
T-SCORE SPINE	-0.49 (1.9)		-0.61 (1.26)		-0.24 (1.34)
T-SCORE NECK	-0.95 (1.53)		-1.29 (1.41)		-1.53 (1.16)
T-SCORE HIP	-1.02 (1.58)		-1.38 (1.58)		-1.42 (1.33)
TOTAL					
CALCIUM SUPP	29 (60.42%)	20 (62.5%)	26 (72.22%)	27 (72.97%)	22 (68.75%)
VIT D SUPP	46 (95.83%)	2 (6.25%)	35 (97.22%)	36 (97.3%)	32 (100%)
BIPHOSPHONATE	4 (8.33%)	5 (15.62%)	3 (8.33%)	5 (13.51%)	6 (18.75%)
DENOSUMAB	7 (14.58%)	7 (21.87%)	7 (19.44%)	7 (18.91%)	7 (21.87%)

On multivariate analysis an inverse relationship between vitamin D and CTX levels was detected ($p \leq 0.05$). DEXA hip measures tend to become stabilized after Bisphosphonate treatment.

Conclusion: On our cohort, bone resorption biomarkers decrease after Vitamin D restoring. Antiresorptive therapy in high risk patients stopped bone loss, especially in hip. After two years follow up, with the treatment algorithm applied, fracture incidence was lower than other series published.

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AB0842 POTENTIAL RISKS FOR OSTEOPOROSIS AND SARCOPENIA IN ALCOHOLIC WOMEN

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Background: Recent statistics indicated an accumulating number of patients with alcohol dependency in Japan. In particular, there had been a considerable increase in the number of alcoholic women, reaching up to 130,000 patients. Because alcoholic women often have insufficient

dietary intake and physical inactivity, they may be at risk for low bone mineral density and decreased muscle power. However, these points may not be widely recognized, and the current program for the rehabilitation of alcoholism may not be sufficient to address this issue.

Objectives: To assess the risk for osteoporosis and sarcopenia in alcoholic women from a nutritional viewpoint

Methods: Thirty-two women (mean age: 42.9 ± 7.49 years) who were admitted to the Alcoholics Rehabilitation Program (ARP) for alcoholism, which was diagnosed according to International Classification of Diseases (ICD)-10, were enrolled in the study. The patients were subjected to self-answered questionnaire, nutritional assessment by expert dietitians, and measurement of body composition and grip strength.

Results: Of the 32 patients, 14 (44.0%) had a history of eating disorder, mostly anorexia. All 32 patients had elevated levels of transaminases at the time of admission. History of bone fracture was present in eight of the 32 (25.0%) patients; among them, at least three (9.4%) cases were considered to be due to a fragility fracture. The mean body mass index (BMI) was 20.4 kg/m²; 10 (31.3%) patients had BMI < 18. The average energy intake was low at 1,474.5 ± 324.3 kcal. Twenty-one (65.6%) patients were taking dietary calcium of <650 mg/day, which is the level recommended for adult women. The mean grip strength was 23.8 ± 6.5 kg, and 8 (25%) patients had grip strength of only <18 kg, which is the definition of sarcopenia in the Asian elderly.

Conclusion: Young to middle-aged alcoholic women should be treated as having high risks for osteoporosis and sarcopenia. ARP should include multidisciplinary assessment and interventions to prevent future locomotive disabilities.

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AB0843 HYPOVITAMINOSIS D IN A MARFAN POPULATION

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Background: Marfan syndrome is an autosomal dominant disorder of connective tissue caused by mutations in FBN1 gene on the long arm of chromosome 15. Information is often lacking regarding an increased risk of fractures and its management and prevention in patients with Marfan syndrome. In these patients reduced bone mineral density was rarely reported. A pivotal role in bone mineralization is played by Vitamin D.

Objectives: This study evaluates whether the reduction of the values of Vitamin D is present in Marfan patients.

Methods: 60 patients (pts) (28 M/32 F; age 15-75 mean age 46,2) with Marfan syndrome were studied. The patients were followed from the clinical and research regional Marfan Center in Florence, Italy. All pts met new Ghent criteria that identified ectopia lentis, thoracic aorta dilatation with Z score = or > 2 and a large group of systemic clinical features represented by cardiovascular, musculoskeletal, central nervous system (dural ectasia) pulmonary, cutaneous and ocular clinical manifestations (systemic features) reaching a score = or > 7 as major clinical criterion. Familiarity and the detection of a gene mutation (in MFS FBN1 gene displays a mutation in about 90% of patients) are also considered criteria necessary for Marfan diagnosis.

Results: 11/60 pts (18,3%) (5M/6F age 15-75 mean age 44,9) showed reduced values of Vitamin D. 6/11 pts (45,4%) (3M/3F age 15-56, mean age 34,1) showed very poor Vitamin D values (range 8.7 ng/ml – 13,17 ng/ml).

Conclusion: Our results suggests that Vitamin D may play an important role in bone metabolism in Marfan patients. These results need confirmation since further data are missing in literature.

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