Osteoporosis

O-1
INFLUENCES OF BLOOD PRESSURE LOWERING ON BONE TURNOVER AND OPG/RANKL/RANK SYSTEM IN NEWLY DIAGNOSED HYPERTENSIVE ADULTS

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Objectives: Blood pressure lowering has been reported display favorable effects on bone turnover in subjects with hypertension. Moreover, renin angiotensin aldosterone system blockage was shown to exert beneficial effect on parenchymal bone cells. The present pilot study was conducted to search for the effects of antihypertensive medication on circulating bone remodeling.

Material and method: Forty subjects with newly diagnosed and never treated hypertension who were free of any other metabolic/chronic disease or medication were included in the study (n = 40, mean age 54.9 ± 10.6 years). Patients were randomly divided into two groups and received monotherapy with amlodipine 5 mg or valsartan 80 mg, with a double dose after two weeks in uncontrolled hypertensive subjects. Blood bone turnover markers and osteoprotegerin (OPG)/RANKL/RANK system were measured before and after a 12-week treatment.

Results: Both treatment arms resulted in significant and equal levels of systolic and diastolic blood pressure lowering. Treatment of individuals either with amlodipin or valsartan did not result any change in serum osteocalcin or serum C-telopeptide of type I collagen (CTX) level (Table). However, amlodipin caused some reduction in CTX blood level compared to valsartan but the difference between the two was not significant (9.5% versus 1.0%, $p = 0.421$). Antihypertensive treatment reduced circulating soluble RANKL (sRANKL) level significantly ($p = 0.004$), however this was evident only in the amlodipin treated subjects ($p < 0.001$) (Table). Although blood OPG concentration did not show any difference after the treatment, sRANKL/OPG ratio decreased significantly by the end of 12th weeks ($p < 0.001$). The decrease in blood sRANKL level correlated negatively to circulating vitamin D concentration ($r = 0.420$, $p = 0.023$).

Discussion: To our knowledge, this is the first human study searching for the association of antihypertensive drug use and bone remodeling markers.

Conclusions: Antihypertensive treatment did not affect circulating bone turnover markers in the present study. Amlodipin resulted in some decrease in blood sRANKL level, suggesting that it may be a better option than valsartan to prevent of bone loss in hypertensive adults.

Table 1 (O-1). Effects of antihypertensive therapy on bone remodeling markers

	Amlodipin (n = 20) Before	Amlodipin (n = 20) After	Valsartan (n = 20) Before	Valsartan (n = 20) After	p1 (A vs V before)	p2 (A before vs after)	p3 (V before vs after)
Osteocalcin (ng/mL)	8.01 ± 3.03	8.46 ± 3.88	8.47 ± 4.28	9.35 ± 3.28	0.697	0.505	0.160
CTX (ng/mL)	18.2-617.3	16.7-560.9	23.4-544.2	25.6-598.8	0.340	0.263	0.881
OPG (pg/mL)	11.2-757.0	43.4-677.4	33.9-990.2	42.2-812.2	0.969	0.191	0.167
sRANKL (pmol/L)	97.9-2290.1	58.6-1113.4	60.4-331.2	103.3-320.2	0.127	< 0.001	0.502

O-3
OSTEOPOROTIC HIP FRACTURES IN A TERTIARY HOSPITAL IN CANTABRIA, SPAIN

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Objectives: To analyze the epidemiological features of hip fracture in an urban tertiary hospital in a region of Northern Spain.

Material and method: We have reviewed retrospectively all the clinical charts of patients, aged 50 years or more, admitted to our hospital from January 2010 to December 2010, with a diagnosis of hip fracture. Patients who had suffered a high-impact trauma or underlying pathological condition, such as bone cyst, cancer, Paget disease of bone, etc. were excluded. Data were obtained through the informatized database of the "Clinical Documentation and Admission Department". Codes used on our search were 820.0–820.9 according to the international classification of diseases, ninth edition (ICD-9-CM).

Results: We have included 289 patients (63 men –21.8%- and 226 women). Mean age was 83.1 (range, 54-99). Seventy-two percent of patients (n = 210) lived in urban areas. Fall was at home in 89.2% of the cases (n = 239). Seventeen subjects (6.3%) had sustained a previous hip fracture. Fourteen patients were on antiosteoporotic drugs (71.4% bisphosphonates) and 26 did receive oral calcium and/or vitamin D (61.5% calcium and vitamin D). Forty five per cent patients (n = 130) had a cervical fracture and 159 a trochanteric one. Fracture was on the left side in 52.9% of the cases (n = 153). Ninety-six percent of patient underwent surgery (n = 166 osteosynthesis and n = 108 prostheses). Postsurgical complications occurred in 74 patients (27%), the most frequent being respiratory infection (n = 9), cardiac failure (n = 5) and sixteen per cent presented prosthesis-related complications (n = 3 mobilization or fracture and n = 9 infection). Mortality was 20.4% (n = 57). Only three patients died during the first month after admission and the rest in the first year after discharge.

Discussion: In our cohort, hip fracture occurred mainly in patients 80 or older, living in urban areas who sustained a fall at home. The female-male ratio was 3.5. Trochanteric fractures, mainly perthrocanteric, were the more frequent type, in both sexes. Surgery remains the mainstay in the treatment of hip fracture according to published data with a high incidence of post-surgical complications increasing consequently the duration of hospital stay and health burden of osteoporotic fractures. Mortality was about 20% in our series, affecting main way older patients with greater comorbidity. Almost all fractured patients in our study, did not receive any antiosteoporotic drug (bisphosphonates, PTH) or supplementation with calcium, associated or not to vitamin D, prior to the event.

Conclusions: Despite having an easily accessible health service and appropriate diagnostic and therapeutic instruments, hip fracture is today a prevalent complication of osteoporosis with a non-negligible morbidity and mortality. Detection of patients at risk for this condition and the implementation of early and proper therapy when needed, could prevent, to a greater extent this type of fracture.

O-4
OSTEOPOROTIC HIP FRACTURES IN A SECONDARY HOSPITAL IN CANTABRIA, SPAIN

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Objectives: To analyze the epidemiological features of hip fracture in a secondary hospital in a region of Northern Spain.

Material and method: We have studied retrospectively all the clinical charts of patients aged 50 years or more, and admitted to our hospital from January 2010 to December 2010, because of hip fracture. Subjects with fractures due to a high-impact trauma, or to an underlying pathological condition, such as bone cyst, cancer, Paget disease of bone, etc., were excluded. Data were obtained through the informatized database of the "Clinical Documentation and Admission Department. Codes used on our search were 820.0–820.9 according to the international classification of diseases, ninth edition (ICD-9-CM).

Results: We have included 186 patients (50 men –27%- and 136 women). Mean age was 84.9 (range, 50-101). Seventy-two percent of patients lived in rural areas. Nineteen subjects (10%) had sustained a previous hip fracture. Only two patients were on antiosteoporotic drugs (calcitonin and teriparatide), and 8 did receive oral calcium and/or vitamin D. Fall was at home in 85% of the cases (n = 161). Eighty-six patients (46%) had a cervical fracture and 100 a trochanteric one. Fracture was on the right side in 57% of the cases. Ninety-eight percent of patient underwent surgery (osteosynthesis or prostheses). Postsurgical complications occurred in 31 patients (17%), the most frequent being respiratory infection, cardiac failure and prosthesis-related complications (movilization or infection). Mortality was 9.7% (n = 18). Seven died during the first month after fracture, and 11 in the first year.

Discussion: In our study, hip fracture occurred mainly in the elderly, in patients living in rural areas, and who sustained a fall at home. Trochanteric fractures were more frequent than cervical ones. Surgery remains the mainstay in the treatment of hip fracture, but post-surgical complications can occur. Mortality was about 10% in our series. Moreover, we have observed that, almost all fractured patients in our study, did not receive antiosteoporotic drugs.

Conclusions: Hip fracture is a prevalent complication of osteoporosis with a high morbidity and mortality. Detection of

patients at risk for this condition and a proper therapy when needed, could prevent, to a greater extent this type of fracture.

O-5
ASSESSMENT OF VERTEBRAL DEFORMITY IN WARFARIN-TREATED WOMEN

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Objectives: Osteoporosis is the most common bone disease and lot of drugs can cause bone loss. Warfarin inhibits the gamma-carboxylation of osteocalcin and may adversely affect skeletal health. Our aim was to determine if warfarin-treated women have more vertebral fractures than non-warfarin treated ones.

Material and method: Retrospective study in elderly women taking warfarin. We included 105 cases (women with atrial fibrillation taking warfarin) and 78 controls (women hospitalized in the Internal Medicine ward not taking anticoagulant treatment). Presence of vertebral deformity was valuated using Genant semi-quantitative method on lateral chest radiography. Data were analyzed using SPSS v15.0 (statistical significance: $p \leq 0.05$) and expressed as mean ± standard deviation, frequencies and percentages, and chi-square test for associations between variables.

Results: 105 warfarin-treated women were identified. Mean age was 80 ± 7 years and 60% were aged ≥ 80 years. Of the 105 patients, 82% arterial hypertension, 41% had heart failure, 34% stroke, 25% diabetes mellitus, 18% vascular disease, 16% kidney failure, 16% dementia and 18% previous fall. Warfarin users and non-users had similar age (79 ± 7, 51% aged ≥ 80 years) and similar prevalence of diabetes mellitus (25% vs 23%). Compared to non-users, warfarin-treated patients had more arterial hypertension (82% vs 52%, $p < 0.001$), more heart failure (41% vs 15.4%, $p < 0.001$), more stroke (34% vs 1.3%, $p < 0.001$) and more kidney failure (16% vs 5%, $p < 0.001$). Warfarin non users had no previous fallen, dementia neither vascular disease. Regarding vertebral deformity rate, 28.6% (n = 30) of warfarin taking patients had vertebral fracture on lateral chest radiography and 29.5% (n = 23) of non-warfarin-treated patients had vertebral deformity, without significant differences between both groups.

Discussion: Contrary to our expectations, we found no association between use of warfarin and vertebral deformity rate in this cohort of older women. Clinical relevance of these observations is uncertain due to contradictory data in scientific literature. Some studies have found that patients taking warfarin has lower bone density than control patients related with long-term exposure to this drug (Philip et al. QJM. 1995;88:635; Caraballo et al. Arch Intern Med. 1999;159:1750). However, other studies reflect that warfarin had no adverse effect on bone density, bone loss or fracture rate (Rosen et al. Am J Med. 1993;94:62; Jamal et al. Ann Intern Med. 1998;128:829) like in our investigation. Differences found in our series regarding chronic disease are logic and had no relevance to the main aim of our study.

Conclusions: Since warfarin inhibits gamma-carboxyglutamate formation, it is suspected that warfarin use accelerates bone loss and increases fracture risk. Despite our study had several limitations due to lack data in clinical records and retrospective design, our series provides data not before reported in our Health Care Area. More extensive studies are necessary to confirm these data.

O-6
OSTEOPOROSIS IN DOWN SYNDROME

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Objectives: Down syndrome (DS) is the most frequent chromosome abnormality in newborns and also the most frequent cause of intellectual disability. However, the life expectancy in this group has increased and many now survive more than 45-50 years, and therefore it is mandatory to pursue research not only in paediatric but also in adult age. It has been demonstrated that patients with DS have a lower bone mineral density (BMD), independent of their age and sex, compared with people not affected by this syndrome. We present a descriptive study of the bone mass of our DS patients, and different epidemiologic and clinical features that may affect it.

Material and method: A descriptive retrospective study of BMD, nutritional and hormonal parameters of 104 DS outpatients, obtained via standard blood analysis and dual energy X-ray absorptiometry (DXA). Osteoporosis was defined by T score equal or under -2.5. Osteopenia as T score between -1 and -2.5.

Results: There was an equal sex distribution with 50% males and 50% females, a mean age of 32.7 years (range 15-62), 61.3 kg of mean weight (39-95.5 kg) and 148.4 cm of mean height (range 128-177 cm). From our group of patients, of which 29.8% were obese, 30.7% overweight and 39.4% normal weight, the mean Body Mass Index (BMI) was 27.95 kg/m^2. 25% of patients were over 40 years, of which 14 (53.8%) were women, 8 (57%) of them post-menopausal. Vitamin D average levels were 25.44 ng/ml, a 35.6% insufficiency (< 30 ng/ml) and 36.5% deficiency (< 20 ng/ml) of vitamin D was observed. Secondary hyperparathyroidism was observed in 5.8% of patients. Betacrosslaps levels were increased in 32.5% of patients whereas 99% presented normal alkaline phosphatase. It was found that 10.6% of women had low oestrogen levels. Compared with BMD of same age and sex, 93% of patients had an appropriate femoral mineral density but only a 63% presented normal lumbar spine bone density. When compared to healthy 30 -year old patients (T score), DS patients presented 2.9% of femoral osteoporosis and 35% of femoral osteopenia, while if we refer to lumbar spine osteoporosis we can objectify a 48.1% of osteopenia, and 22.1% of osteoporosis. As expected, age and bone disease are associated and a statistically significant association was established between having lumbar spine and femoral bone affected ($p < 0.001$). Lumbar (p 0.023) and femoral (p 0.038) osteopenia and osteoporosis were also statistically significantly associated to low oestrogen levels. No statistically significant association was established in our study between Vitamin D levels, betacrosslaps, weight or gender with BMD measured with DXA. There was a tendency for males to have more bone disease, but no statistically significant association was found.

Discussion: As previous studies have suggested, our DS patients presented more frequently an altered BMD, which allows us to compare their osteoporosis/osteopenia prevalence to that of Spanish women between 60-69 years of age. However this was not associated with higher bone resorption or low Vitamin D levels. Our data reveals that males with DS have a higher tendency for osteoporosis, although no relationship with hypoandrogenism was established.

Conclusions: Down syndrome patients present altered DXA with higher frequency than population non affected by the syndrome, albeit with some specific characteristics. Therefore it would be necessary to perform further studies in search of biomechanic, genetic and hormonal factors that may interfere in their bone alterations and differentiate them from those of the general population.

O-8
FACTORS THAT INFLUENCE FRACTURE TYPE, MORTALITY AND FUNCTIONAL RECOVERY IN OLD PATIENTS WITH OSTEOPOROTIC HIP FRACTURE

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Objectives: To analyze patients (pats) admitted for hip fracture (Fx) secondary to a low impact trauma and to investigate determinants of morbimortality and presence of determining factors on the type of Fx.

Material and method: From March 1, 2009 to December 31, 2010, all pats admitted with osteoporotic hip Fx in a university hospital, were visited in a prospectively and formalized way. Sociodemographical, clinical and analytical data were collected. Data referred to the patient's status before the Fx, complications arising during admission and at discharge. Phone follow-up were performed after 3 months and after one year of hospital discharge. We analyzed which variables were associated with cognitive and functional recovery and mortality. We assumed that there would be functional recovery if one of these premises were met: positive opinion from the pat or family, no significant decline of the Barthel index (BI) (lower than 20 points) and maintenance of walking ability (self moving ability, a support, walker or wheelchair). We assumed there was cognitive recovery when the opinion of the pat or the family was positive and showed no deterioration in the Pfeiffer test (PT).

Results: 425 pats were included with a mean age 83 ± 8 years. Women (72%) were older than men (84 ± 8 versus 81 ± 8 years, $p < 0.01$). On admission, the body mass index (BMI) was 25.7 ± 4.8 Kg/m^2. The Charlson comorbidity index (CI) medium was 1.7 ± 2.0 and BI, 76 ± 29 points. Pats were categorized according to mistakes in the PT: The median ± SD was 1.82 ± 1.09. 15.9% of pats, 14.3% and 12.8% showed mild, moderate or severe deterioration, respectively. Dementia was present in 69 pats (17.64%). The mean number of currently taken drugs was 6 ± 5. Regarding laboratory parameters, mean haemoglobin was 11.8 ± 1.9 g/dL, serum creatinine, 98 ± 72 mmol/L (normal renal function in 65% of patients, estimated by the MDRD-creatinine clearance rate), albumin levels were 31.4 ± 4.3 g/L. With respect to bone metabolism, a calcidiol serum level of 29.2 ± 24.7 nM/L stands out. The majority of Fx was either pertrochanteric (45%) or subcapital (43%). The most frequent surgical procedure was placement of osteosynthesis material (59%). Subcapital Fx were associated with a lower previous status estimated by the BI (71 ± 33 vs 79 ± 24; $p < 0.01$) and PT (55% vs 45% of the pats with some degree of deterioration; $p < 0.05$). None of the other analyzed variables was related with the type of hip Fx. Seven% of the pats died during hospitalization, 9% before the 3 months and 9% during the first year. Statistically significant factors associated with higher mortality were: male gender, older age, lower BMI, worse CI, IB and PT, higher drugs use, hypovitaminosis D, worse renal function and lower concentrations of serum albumin and haemoglobin. The type of Fx or surgical intervention was not associated with mortality. In surviving pats, the frequency of functional recovery after 3 months and after one year was 63% and 61% respectively (p not significant). Cognitive recovery was 35% and 36% respectively (p not significant). Statistically significant variables that determined the absence of functional recovery were older age and lower calcidiol and serum albumin. A lower cognitive recovery was determined by older age, worse IB and worse PT.

Conclusions: Pats with hip Fx present a high mortality. On admission, predictors of morbidity and mortality were male gender, older age, lower BMI, worse CI, IB and PT, higher drugs use, hypovitaminosis D, worse renal function and lower concentrations of serum albumin and haemoglobin. In pats with hip Fx, a more evident deterioration in functional status and a poorer previous cognitive state determines a larger frequency of subcapital Fx.

O-9
THERAPIES WITH CALCIUM SUPPLEMENTS OR ANTIRESORTIVES IN OLD PATIENTS BEFORE AND AFTER OSTEOPOROTIC HIP FRACTURE

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Objectives: To investigate phospho-calcium metabolism in patients (pats) with hip fracture (Fx), with special emphasis on the serum concentration of calcidiol and response to supplements of calcium (Ca) and vitamin D (vitD). Another aim was to analyze the osteoporotic Fx prevention in these pats before and after the Fx.

Material and method: From March 1, 2009 to December 31, 2010, all pats admitted with osteoporotic hip Fx in an university hospital, were visited in a prospectively and formalized way. Sociodemographical, clinical and analytical data were collected. Data referred to the patient's status before the Fx, complications arising during admission and at hospital discharge. Analytical parameters of phospho-calcium metabolism were identified in peripheral blood. Pats were inquired about administration of Ca and/or vitD supplements. With regard to phospho-calcium metabolism, pats with a glomerular filtrate < 30 ml/min were excluded (n: 101). Deficiency of vitD was defined as the serum concentration of calcidiol < 25 nM/L and insufficiency as < 50 nM/L.

Results: We included 425 pats with a mean age 83 ± 8 years. Women (72%) were older than men (84 ± 8 versus 81 ± 8 years, $p < 0.01$). On admission, the Barthel index was 76 ± 29 points. Pats were categorized according to mistakes in the Pfeiffer's test: The median ± standard deviation was 1.82 ± 1.09. 15.9% of patients, 14.3% and 12.8% showed mild, moderate or severe deterioration, respectively. Dementia was present in 69 pats (17.64%). Regarding laboratory parameters, mean haemoglobin was 11.8 ± 1.9 g/dL, serum creatinine, 98 ± 72 mmol/L (normal renal function in 65% of pats, estimated by the MDRD-creatinine clearance rate), albumin levels were 31.4 ± 4,3 g/L and calcidiol serum level was 29.2 ± 24.7 nM/L. With regard to phospho-Ca metabolism, we included finally 324 pats (83 ± 8 years, 71% women). 58% of pats had vitD deficiency. The monthly distribution of the average concentrations of calcidiol showed a statistically significant increase in the summer months. Pats receiving Ca and vitD supplements had a higher mean serum concentration of calcidiol (47.6 ± 43.4 nM/L vs 25.2 ± 11.2 nM/L; $p < 0.001$), a lower vitD deficiency (24% vs 60%; $p < 0.001$) and insufficiency (71% vs 96%; $p < 0.001$) than those who did not receive them. 77 pats (18%) reported to have been diagnosed osteoporosis. 144 (39%) had had an osteoporotic Fx. 39 (11%) had undergone to a bone densitometry. 88 pats (23%) had been treated with Ca and vitD. 60 pats (19%) had received antiresorptive or anabolic treatments (AAT), 56 (14%) were taking some AAT at the time of admission (bisphosphonates [BisP]: 80%, strontium ranelate [SRa]: 14%; calcitonin: 6%). 30% of pats with prior Fx were receiving AAT as opposed to 14% of non-fractured ($p < 0.001$), 84% of pats with a previous hip Fx were not receiving AAT. AAT administration was not related to age or cognitive or functional previous status. At discharge, AAT was prescribed to 244 pats (63%): BisP: 88%, SRa: 11%; teriparatide: 1%. Three months after hospital discharge, 155 pats (48%) continued receiving AAT: BisP: 85%, SRa: 13%, raloxifene: 2%, teriparatide: 1%. One year after discharge, 139 (47%) were

receiving AAT: BisP: 85%, SRa: 9%, raloxifene: 3%, teriparatide: 3%, calcitonin: 1%.

Conclusions: In hospitalized patients with hip Fx, there is a high prevalence of hypovitaminosis D which did not achieve a satisfactory decrease in the subgroup that received vitD supplements. In a high Fx risk population, the frequency of treatment for the prevention of Fx is very low, regardless of age and of the previous cognitive and functional status. The treatment adherence decreases after hospital discharge but it is higher than what has been reported in previous studies.

O-14
LOW BONE MINERAL DENSITY IN A COHORT OF FEMALES WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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Objectives: Assess the prevalence of low bone mineral density (BMD) in a cohort of patients with Systemic Lupus Erythematosus (SLE) and identify risk factors associated with it.

Material and method: Retrospective and descriptive analysis of 77 female patients with SLE (ACR criteria 1997), recorded in a database on the Internet (www.registroles.es). BMD was estimated in all patients by calcaneal peripheral densitometry (densitometer PIXI-Lunar®) and was considered pathological with a T-score < -0.6 (osteopenia T < -0.6, osteoporosis T < -1.6). Risk factors assessed were age, body mass index (BMI), smoking, sedentary lifestyle, whether patients had reached menopause and its age of onset, duration of SLE, the number of outbreaks, treatment with pulses of intravenous corticosteroids, disease activity index (SLEDAI) and SLICC damage index. The data were processed using SPSS 20.0.

Results: The mean age of patients was 39.2 ± 1.4 years, with an average disease duration of 120.4 ± 11.1 months and 4.6 ± 0.8 disease outbreaks. The mean SLEDAI and SLICC damage index at the time of registration were 4.9 ± 0.5 and 1.7 ± 0.2, respectively. The average BMI was 24.7 ± 0.5. 71.4% of patients were premenopausal, 39% smokers and 66.2% had a sedentary lifestyle. Only 10.4% had received pulses of intravenous steroids. BMD was pathological in 28 of the patients (36.4%), of which 19 had osteopenia (24.6%) and 9 osteoporosis (11.7%). Comparing both groups with normal and pathological bone densitometry, the only variables with statistical significance were menopause, disease duration and menopause.

Conclusions: 1. These patients were mostly young and of reproductive age. They had a long disease duration, moderateactivity and low chronicity. 2. There was a high prevalence of potentially modifiable risk factors (smoking and physical inactivity). Only one tenth of the patients had received intravenous steroids. 3. More than a third of the patients had low BMD. More than a tenth had osteoporosis. 4. Association between low BMD and age, menopause and duration of SLE was statistically significant.

O-15
RELATIONSHIP BETWEEN OSTEOPOROSIS, OBESITY AND THE INSULIN RESISTANCE INDEX IN A POPULATION OF PRE AND POSTMENOPAUSAL WOMEN

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Objectives: In our study we hope to find a possible association between obesity and insulin resistance with osteoporosis.

Material and method: We performed a prospective study of cases and controls in the Valladolid hospital, Rio Hortega, that included 286 pre and postmenopausal women between the ages of 38 and 85. We collected data including comorbidity, treatments, weight and height. We classified the degree of obesity according to the WHO. We measured the levels of vitamin D and plasma insulin, and calculated the insulin resistance index according to the HOMA test. Densitometry was performed at the lumbar spine and the hip, considering osteoporosis to be a bone mineral density lower than 2.5 standard deviations below the peak bone mass in young adults (T-score ≤ -2.5).

Results: We found a correlation between the insulin resistance index and obesity in the overall study population, the HOMA test increasing as the body mass index increased (HOMA average cases of grade II obesity 8.3 ± 9.4 versus 2.4 ± 2.6 in those of normal weight). Upon stratifying by osteoporosis, this relationship is lost and there exists a greater insulin resistance among patients of normal weight than among obese. In addition, we observed a lower percentage of osteoporosis among obese (obesity grade I 7.3%, overweight 38.7%) than in patients of normal weight (54%), with a statistically significant difference (p = 0.029). Excluding women under treatment for diabetes mellitus, we found no significant differences in HOMA or the percentage of osteoporosis.

Discussion: Osteoporosis and obesity maintain an inverse relationship, bone mineral density rising as body weight and body mass index also rise. This has been demonstrated in numerous studies as well as being in agreement with our own study, in which we have found a lower percentage of osteoporosis among patients with greater obesity. One possible explanation would be the mechanical effect that occurs in obesity, which could have a protective effect on the bone. Furthermore, the adipose tissue may have an influence due to the production of hormones and adipokines such as leptin, adiponectin, resistin and interleukins. In postmenopausal women, body fat mass and bone mineral density are positively associated, possibly due to the androgen's aromatization of the estrogens through the adipose tissue, accompanied by the hormone transporter of sex hormones. However, there is some controversy over whether the body fat has a protective effect for osteoporosis, as there are studies which have shown there exists an increased risk of osteoporosis with an increase in the proportion of body fat. Furthermore, there may be a participation of the hormones secreted at the pancreatic level, such as insulin, amylin and preptin. Hiperinsulinemia secondary to insulin resistance has been suggested as a possible explanation for the relationship between obesity and bone mineral density. The insulin would have a mitogenic effect on the osteoblasts, stimulating their function. However, in some studies this association has not been found, which could points towards the existence of other responsible hormonal factors. In our study we found a greater insulin resistance index among obese. But on the other hand, upon comparing cases of osteoporosis against those without osteoporosis, this relationship was lost. This could indicate that insulin resistance is not one of the mechanisms involved in the relationship between obesity and osteoporosis.

Conclusions: In our study we have not been able to demonstrate a relationship between insulin resistance and osteoporosis, which disagrees with the facts obtained in the latest publications. For this reason, we believe that it is necessary to carry out more studies analyzing this possible association.

O-16
PATIENTS ADMITTED WITH HIP FRACTURE HAVE A HIGHER INCIDENCE OF PREVIOUS FRACTURES THAT PATIENTS ADMITTED IN THE HOSPITAL BY OTHER DISEASES: A CASE-CONTROL STUDY OSTEOPOROSIS WORKING GROUP OF THE SPANISH SOCIETY OF INTERNAL MEDICINE (GTO-SEMI)

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Objectives: 1) To know data on the types of hip fracture. 2) To study the incidence of previous fractures, the incidence of family history of hip fracture, and to make a comparative analysis with a group of patients admitted for another condition.

Material and method: This is a prospective multicenter cooperative study case-control Osteoporosis Working Group of the Spanish Society of Internal Medicine (GTO-SEMI). in which cases are patients admitted for hip fracture and controls, patients of the same age, admitted to internal medicine without current hip fracture either upon. It is a descriptive analysis of data on hip fractures in the group of cases and a comparative analysis of family history, personal history of fracture and history of falls between cases and controls. Statistical analysis: chi-square test.

Results: We collected 890 patients, 443 cases and 447 controls, for 17 hospitals. General epidemiological data. In the case group, there were 332 women (74.9%) and 111 males (25.1%), with a ratio female/male 3/1. Age: 50-103 yrs, mean 82.3 ± 8.5 yrs, with differences between women (83.0 ± 8.2 yrs) and males (80.1 ± 8.9 yrs): $p < 0.05$. In the control group, there were 308 women (68.9%) and 139 males (31.1%), with a ratio female/male of 2.2/1. Age: 53-102 yrs, mean 80.4 ± 8.3 yrs, with differences between women (81.7 ± 7.8 yrs) and males (77.5 ± 8.8 yrs), $p < 0.05$.Data related to fractures. Types of hip fractures: cervical, 171 (38.6%); trochanteric, 198 (44.7%); subtrochanteric, 58 (13.1%); other, 12 (2.7%); unspecified, 4 (0.9%). Side of fracture: the right, 222 (50.1%); left, 218 (49.2%), unspecified, 3 (0.7%). 23 patients (5.2%) had other fractures coincide with hip fracture: wrist, 10 (2.25%); humerus, 7 (1.6%); another, 6 (1.4%). Family history of fractures: cases, 71 (16%); controls, 51 (11.4%); $p = 0.051$. Personal history of fractures were 123 patients (27.8%) in the case group (wrist fracture, 34; humerus fracture, 17; vertebral fracture, 15; other fractures 58) and 50 patients (11.2%) in the control group (wrist fracture, 16; humerus fracture, 10; vertebral fracture, 9; other fractures, 20), $p < 0.001$. They had falls in the last year 189 patients (42.7%) in the case group, median 2, and 124 (27.7%) patients in the control group, median 2, $p < 0.001$.

Conclusions: 1. About 30% of patients with hip fracture had already had a previous fracture. 2. Compared with controls, patients with hip fracture had a higher incidence of previous fractures and falls. 3. Also had a higher proportion of patients with a family history of hip fracture in the case group than in controls, close to statistical significance. 4. These data reinforce the need to identify patients most at risk and implement preventive measures to prevent hip fracture.

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UTILITY OF MARKERS OF BONE RESORPTION AND FORMATION IN PATIENTS WITH CHRONIC CORTICOSTEROID TREATMENT

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Objectives: Bone markers are products of bone cells, or its action on bone, which can be measured in blood and urine and report on the state of bone remodeling. With other clinical data they can be used to evaluate patients with osteoporosis (OP), and to determine adherence to treatment and response. Its usefulness in the management of osteoporosis induced by glucocorticoids (GC) is still questioned. The aim of our study is to establish the usefulness of these markers as predictors of bone loss in patients with chronic steroid therapy.

Material and method: Prospective observational study in a cohort of patients diagnosed with any autoimmune diseases treated with GC, for more than 3 months. As formation markers, osteocalcin (BGP) and bone alkaline phosphatase (Ostase) were measured; and as resorption markers: Beta CrossLaps (CTX) and tartrate-resistant acid fofatasa (TRAP). Also measured osteoprotegerin (OPG), a protein involved coupling in the formation/resorption. We performed a statistical analysis to determinate the degree of correlation between the percentage of increase in bone mass and the various markers of bone resorption and formation.

Results: We analyzed a total of 141 patients (76.6% women), mean age: 56 ± 15 years; mean dose of prednisone: 5.19 ± 3.5 mg/day.

Conclusions: In our study no statistically significant relationship between percentage of bone loss and markers of bone formation or resorption were found. Thus, these markers do not show utility as predictors of bone loss in patients with chronic steroid therapy.

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OSTEOMED: A PROJECT OF OSTEOPOROSIS WORKING GROUP OF THE SPANISH SOCIETY OF INTERNAL MEDICINE ANALYSIS OF THE FIRST 500 CASES

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Objectives: To develop a database of patients with osteoporosis of Internal Medicine consultation centers in Spain.

Material and method: The Osteoporosis Working Group of the Spanish Society of Internal Medicine (GTO-SEMI) has developed a medical history available on the Web. Inclusion criteria. There are eligible patients with osteoporosis, osteopenia and fragility fractures (irrespective of bone mass) that can be studied and followed according to clinical practice. We made an descriptive analysis of the first 500 cases.

Results: General epidemiological and clinical data. We collected 500 patients, 432 women (86.4%), aged 66.8 ± 11.2 yr and 111 men (13.6%), aged 63.9 ± 12.8 yr. 264 (52.8%) are naïve patients and 236 (47.2%) are patients in treatment.. Anthropometric data: height, 156.08 ± 8.02 cm; weight 65.1 ± 11.2 K, BMI, 28.7 ± 4.2 K/m^2. Here are the most relevant data about risk fracture factors, fractures and treatments: 142 (28.4) patients with a family history of fractures or osteoporosis. 47 (9.8%) patients were smokers and 48 (9.2%) are ex-smokers. The median daily intake of dairy calcium is 556 mg. Most common diseases associated with effects on bone metabolism are nephrolithiasis (55 pts, 11%), hypothyroidism (45 pts, 9%), and hypercalciuria (27 pts, 5.4%). 125 (25%) patients had a history of vertebral fracture and 75 patients (15%), history of nonvertebral fracture. The mean lumbar spine T score was -2.74. The mean T-score at the femoral neck was -2. The distribution bycategory of T-score was as follows: at the lumbar spine < -2.5, 278 patients; -1 to -2.5, 103 patients, > -1 patients, 18. At the femoral neck was < -2.5, 140 patients; -1 to -2.5, 235 patients; > -1 patients, 68. Treatment. Number of patients with each drug: Calcium 369, Vitamin D 401, Risedronate 112 Alendronate 91, Ibandronate 31, Zoledronic 11, Raloxifene 10, Strontium Ranelate 58, Teriparatide 34, PTH 1-84 27, Denosumab 4.

Conclusions: 1. At this moment, we have included 500 patients, half naive and half treated. 2. About 80% of the patients are women with a mean age of 65-70 years. 3. About 30% of patients have family history of major fractures or osteoporosis, while the sum of patients with vertebral and non-vertebral fracture is 40%. 4. 55% of patients had osteoporosis criteria in lumbar spine and femoral neck 28%. 5. Almost all patients treated, take calcium and vitamin D. Of the patients with active treatment, most are taking bisphosphonates.