Original article

Rheumatology and osteoporosis (RETOSS): a vision of postmenopausal osteoporosis in rheumatology departments throughout Spain

Miguel Bernad Pineda,⁎ Carlos Manuel González Fernández, Manuel Fernández Prada, Jaime Fernández Campillo, Rosaura Maeso Martín, María Victoria Garcés Puentes

⁎Corresponding author.


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ABSTRACT

Objective: To know the characteristics of the postmenopausal women with osteoporosis consulting Rheumatology Hospital Divisions in Spain.

Methods: An epidemiologic, observational, transverse and multicentric study was performed from June to September 2008 in 63 rheumatology divisions in Spain. Six hundred and twenty nine postmenopausal women were studied using a questionnaire designed to get demographic, clinical, radiological, bone density, and functional information. Every physician had to choose only one patient per day, usually the first woman to come in and fulfill the inclusion and exclusion criteria.

Results: Mean age of included women was 66.6 (9.2) years, weight: 64.6 (10.1) kg and body mass index: 26.1 (4.1) kg/m². They were 3.1 (2.8) cm shorter than the maximal historical height. 35.7% of them had a family history of fracture and 40.7% had a past history of fracture, of which 54.8% were vertebral fractures. Patients who received calcidiol <20 ng/ml sustained more falls (P=0.033) and fractures (P=0.006) than women receiving calcidiol >20 ng/ml. Risk of falls and fractures increased with advancing age and 51.5% of women who fell, had a fracture. 75% of women had poor calcium intake (≤400 mg/day). The Get up & go test showed a linear trend to an increased probability of >20 s in relationship with the age as well as with an increased incidence of fractures. 71.8% of patients had back pain and in 85.3% it went from moderate to severe.

Conclusion: Most osteoporotic postmenopausal Spanish women have a low calcium intake, one out of three has a family history of fractures that increases fracture incidence and this shows a relationship with age and functional capacity; four out of ten have had any type of fractures, one out of three have fallen during the past year and half of these present back pain. Calcidiol levels have been evaluated in a small group of patients.

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Reumatología y osteoporosis (RETOSS): osteoporosis posmenopáusica en la consulta de reumatología

Resumen

Objetivo: Conocer las características de las mujeres posmenopáusicas con osteoporosis que acuden a las consultas hospitalarias de reumatología en España.

Métodos: Desde junio a septiembre de 2008 se realizó un estudio epidemiológico, observacional, transversal y multicéntrico en 63 consultas de reumatología en toda España. Se evaluaron 629 mujeres posmenopáusicas con osteoporosis utilizando un cuestionario diseñado para recoger datos demográficos, clínicos, radiológicos, de densidad ósea y de función física. Cada médico participante escogió una paciente por día; la primera que cumplía los criterios de inclusión y exclusión.

Resultados: La media de la edad fue de 66.6 (9.2) años, del peso fue de 64.6 (10.1) kg y del índice de masa corporal (IMC): 26.1 (4.1) kg/m². La pérdida de talla media fue de 3.1 (2.8) cm en relación con la media de la talla histórica. El 35.7% tenía antecedentes familiares de fractura, el 40.7% había tenido alguna fractura, de las cuales el 54.8% eran fracturas vertebrales. En las pacientes que presentaban calcidiol < 20 ng/ml se ob-

⁎Corresponding author.
E-mail address: mbernadp@hotmail.com (M. Bernad Pineda).

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Osteoporosis is a public health issue the world over and in Spain in particular, affecting different population groups, although it reaches its highest incidence in post-menopausal women. All around the world, some 200 million individuals suffer from osteoporosis and every year 1.7 million hip fractures occur due to osteoporosis. In 2050, this figure may be multiplied by 52. In the United States and the European Union, approximately 30% of all post-menopausal women and one out of every 8 men over the age of 50 have osteoporosis. However, many cases of osteoporosis are not diagnosed and often go untreated despite the fact that the person has suffered a fracture.

Osteoporosis is a disease that has no clinical manifestations until the first fracture occurs; this fracture may be spontaneous or due to low or minimal impact trauma. Fractures can occur in any location, although the most clinically relevant are vertebral fractures, fracture of the proximal femur, and Colles’s fracture, resulting in decreased quality of life due to pain, disability, dependence, and even death, in the case of hip fracture. The prevalence of all osteoporotic fractures is higher in women than in men. The WHO estimates that 40% of women over the age of 50 can suffer a fracture at some point during their lifetime. In Spain, the prevalence of vertebral fracture in this group of women varies between 15 and 27%. The yearly incidence of fractures of the femur in women over the age of 50 have osteoporosis. However, many cases of osteoporosis are not diagnosed and often go untreated despite the fact that the person has suffered a fracture.

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with the participation of 63 rheumatologists from around the entire country. Six hundred and twenty-nine post-menopausal women with a diagnosis of osteoporosis based on bone densitometry and/or the presence of fragility fracture (vertebral, Colles or hip) were included in the study. For the purpose of randomization, it was stipulated that each physician was to evaluate only one patient each day and that this patient was to be the first one to meet the inclusion and exclusion criteria.

Patient inclusion criteria for this study were: to be assigned to a rheumatology department and menopausal with a diagnosis of osteoporosis. Exclusion criteria included women who had or had previously had a diagnosis of diseases affecting bone metabolism such as hypogonadism, liver disease, kidney disease, hyper or hypothryoidism, hyperparathyroidism, malabsorption syndrome, neoplasms, and those who were or had been under treatment with drugs that affect bone metabolism, i.e. corticosteroids, thyroid hormones, anti-epileptic drugs, anticoagulants, and cytostatic medications.

A questionnaire was filled in for each patient that included age, weight (kg), and both historical and current height (cm), and the subject’s BMI was calculated (kg/m²). The clinical interview collected data with regard to gynaecological history (age at menarche and menopause, number of children), level of educational studies (no qualifications, primary school, secondary school, and university level), and a family history of fracture (mother, sister, or father). Intake of dairy products was determined on the basis of intake the previous day, considering a dose as: 1 glass of milk or 2 yoghurts or 1 yoghurt plus cheese, equivalent to 200 mg of calcium. Doses of alcohol (g/day) were defined as: 40 g/L, wine: 96 g/L, and spirits: 320 g/L; the individual was considered to be a “drinker” if she had more than 7 doses or 170 g per week.

Exposure to sunlight was evaluated as being adequate if the patient went out almost every day (at least 4 days per week) and physical activity was deemed adequate if she took walks or exercised at least 3 times per week and more than 3 hours per week. Current or prior smoking was quantified in terms of packs/year, multiplying the number of cigarettes smoked per day by the number of years the patient smoked; the result was divided by 20. The frequency of falls was ascertained with and without fractures during the preceding 12 months. The patients were asked about the incidence and location of the fractures.

Information was obtained from the clinical history about the method and time elapsed since the diagnosis of osteoporosis and history of fractures; densitometric values were also collected, as were serum calcidiol concentrations at the time of diagnosis and recent values.

The modified Get Up & Go test²² was used to evaluate functional capacity. Patients were asked to get up out of their seats (without using their hands), walk 3 metres, and to sit down again. If the time needed to complete these tasks was > 20 seconds, functional capacity was considered to be limited and there was a greater risk of suffering falls.

The intensity of back pain was quantified using the Visual Analogue Scale (VAS, scoring from 0 to 100), pain was rated as chronic if it persisted for more than 6 weeks. Finally, the patients were questioned to determine if they lived alone or with others and if they were dependent or independent.

The diagnosis of osteoporosis was based on densitometric values (T-score < −2.5) determined by DXA or in the presence of vertebral fractures by means of semi-quantitative analysis of lateral X-rays. A vertebral fracture was defined as a reduction in height of 20% or more as compared to the adjacent vertebrae.⁴⁴

The results were analyzed using the SPSS software package version 13.0. A descriptive analysis was made of the central tendency (mean and standard deviation) for quantitative variables and frequency for qualitative variables. After checking that the data followed normal distribution, statistical tests were conducted to compare the means of paired data (T-test) and to evaluate the association of qualitative variables (Chi squared). The results are expressed as the mean and standard deviation (SD).

The study protocol was approved by the corresponding local Ethics Committees in accordance with the directives of the Declaration of Helsinki.

All the patients included in the study received sufficient information and gave their informed consent in writing to participate in the study.

Results

Most of the patients were referred to the rheumatologist by primary care physicians (66.3%), by gynaecologists (13.8%) or by traumatologists (10%). Table 1 illustrates the characteristics of the 629 patients with ages ranging from 41 to 91 years. Eighteen per cent of the patients had no formal qualifications; 48% had had a primary school education; 27% had completed secondary school, and 7% had university degrees. The time elapsed since the diagnosis of osteoporosis was 4.0 (4.31) years; (95% CI 3.66-4.33). The difference between their current height and their historical height indicates that they had lost a mean of 3.1 (2.8) cm in height (95% CI 2.86-3.36).

The diagnosis of osteoporosis was made in 51.4% of the patients on the basis solely of bone densitometry (BMD); in 27.3%, the diagnosis was based on BMD as well as the presence of vertebral fractures, and in 13.4%, the diagnosis was made on the basis of only vertebral fractures. At the time of current data collection, BMD had been performed in 52.1% of the patients during the last year and all had received treatment for their osteoporosis for at least 12 months. The average time elapsed between the 2 BMD determinations was 4.4(3.5) years (95% CI 4.02-4.77).

A predominance of osteoporosis in the lumbar spine was seen in the first BMD determination carried out for the diagnosis (T-score−2.90); additionally, there was also a significant increase in densitometric values in both the lumbar spine and in the femoral neck at the time the data for this study were being collected (Table 2).

More than thirty-five per cent (35.7%) of the patients stated that there was a family history of fracture: of these, 54.6% had hip fractures; 22.7% were vertebral fractures; 18.2%, Colles’s fractures, and 4.6% were fractures in other locations. When evaluating the association between the existence or not of a family history of fractures and the presence of fractures in the patients, we found that the relative risk of fractures is twice as high in women with a positive family history for fracture than in those who had no such history (RR=2.03; 95% CI 1.45-2.84).

Six per cent (6%) of the patients stated that they did not consume dairy products; 31% only consumed the amount equivalent to 200 mg/day of calcium; 38% consumed the equivalent of 400 mg/day, and 25%, consumed the equivalent of 600 mg/day or more.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean (SD)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>66.6 (9.2)</td>
<td>65.9-67.3</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>64.6 (10.1)</td>
<td>63.8-65.4</td>
</tr>
<tr>
<td>Height, cm</td>
<td>157.6 (6.9)</td>
<td>157.1-158.9</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>26.1 (4.1)</td>
<td>25.7-26.4</td>
</tr>
<tr>
<td>Age at menarche, years</td>
<td>12.6 (1.6)</td>
<td>12.5-12.8</td>
</tr>
<tr>
<td>Number of children</td>
<td>2.4 (1.5)</td>
<td></td>
</tr>
</tbody>
</table>

CI indicates confidence interval; SD, standard deviation.

* n = 629 post-menopausal women with osteoporosis.
Just over ten per cent (10.9%) were smokers; 6.9% were former smokers, and 5.4% used alcohol. More than sixty-three per cent (63.5%) were exposed to the sun on a regular basis, and 47.1% did some kind of physical exercise.

A statistically significant difference was observed between the baseline concentration of serum calcidiol at diagnosis determined in only 20.3% of the patients and the current value, collected in 25.1% \( (P < 0.001) \). Of all the women who participated in the study, 82.8% received treatment with supplements of calcium+vitamin D. In the oldest age groups, an increase was seen in the frequency of patients with concentrations of calcidiol <20 ng/mL (Figure 1). The X-ray of the spine revealed the presence of deformities and/or fractures in 39.8% of the patients. The frequency of fractures increases significantly with age. Starting at 71 years of age, more than half of the patients presented fractures, reaching 66.7% in subjects over the age of 75. The most common locations were vertebrae T12 and L1.

Almost forty-one per cent (40.7%) of the patients studied had a history of fractures, most commonly vertebral fractures (54.8%); 27.1% had suffered a Colles’s fracture; 7.9% had a history of hip fractures, and 10.2% had had fractures in other locations. Some patients had had more than one fracture.

The mean value of the Get Up & Go test score was 16.2 (11.3) seconds (95% CI; 15.21-7.17). A value of <15 seconds was observed in 58.2% of the patients; in 25.1%, the values were between 15 and 20 seconds, and in 16.7%, it was more than 20 seconds (Figure 2a). In this last group with the worst Get Up & Go test results, 45.9% of the women had fallen in the preceding 12 months. They also presented a significantly higher incidence of fractures in comparison with the other two groups (63.5% vs 35.2% and 34.8% in the groups with values from 15 to 20 seconds and <15 seconds, respectively) \( (\text{Chi}^2=24.241; P< 0.001) \) (Figure 2b).

As patients aged, the probability of falls increased significantly \( (P=0.001) \). Over the course of the preceding 12 months, 31.2% of the patients had suffered at least one fall, resulting in fracture in 51.5% of the cases. The frequency of location of the fractures that were a direct consequence of the fall was: 39.6% Colles’s fracture, 33.7% vertebral fractures, and 20.8% were fractures of the hip. Of those patients

<table>
<thead>
<tr>
<th>Calcidiol, ng/ml</th>
<th>Mean</th>
<th>SD</th>
<th>95% CI</th>
<th>% of variation</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>(D)</td>
<td>28.6</td>
<td>19.7</td>
<td>−14.77; −7.27</td>
<td>38.8</td>
<td>.000</td>
</tr>
<tr>
<td>(R)</td>
<td>39.7</td>
<td>25.1</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>BMD, g/cm²</th>
<th>Lumbar spine L₂-L₄</th>
<th></th>
<th>Femoral neck</th>
<th></th>
<th>Total hip</th>
<th></th>
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<tr>
<td>(D)</td>
<td>0.752</td>
<td>0.12</td>
<td>0.699</td>
<td>0.13</td>
<td>0.766</td>
<td>0.10</td>
</tr>
<tr>
<td>(R)</td>
<td>0.786</td>
<td>0.12</td>
<td>0.734</td>
<td>0.13</td>
<td>0.774</td>
<td>0.09</td>
</tr>
</tbody>
</table>

BMD indicates bone densitometry; CI, confidence interval; (D), diagnosis; (R), recent; SD, standard deviation.

Table 2
BMD and calcidiol values at the time of diagnosis (D) and most recent (R)\(^a\)

\(^a\)n=629 post-menopausal women with osteoporosis.

![Figure 1](image1.png)

Figure 1. Levels of calcidiol (ng/ml) by age groups.

![Figure 2](image2.png)

Figure 2. a) Get Up & Go test by age ranges. b) Frequency of fractures vs Get Up & Go test.
who had a history of a fall in the last 12 months, 66.3% of them also presented at least one fragility fracture. In contrast, the incidence of fragility fractures in the patients without a history of falls was lower, 29.2% (RR: 4.8; 95% CI 3.34-6.89).

A significant, inverse relation (P=.033) was found between the level of calcidiol at baseline and the proportion of patients who suffered falls, with the greater proportion of them occurring in the group with a baseline level of calcidiol >20 ng/mL. Likewise, the group of patients with calcidiol values <20 ng/mL presented a greater frequency of fractures versus the group of subjects with calcidiol values >20 ng/mL (P=.006) (Figures 3a and 3b).

More than seventy per cent (71.8%) of the patients reported having back pain and in 85.3% of the cases, the pain was chronic. The intensity of pain was rated as moderate to severe in 65.4% of cases. Likewise, almost all the patients who had worse scores on the Get Up & Go test also had back pain, probably related to the presence of fracture(s). The presence of vertebral fracture has a decisive influence on the existence of back pain (Chi²=29.106; P=.0001). Patients with vertebral fracture have a RR=2.877 (95% CI 1.943-4.260) of suffering from back pain.

Discussion

We are interested in gaining greater insight into the profile of post-menopausal patients with osteoporosis who seek help at rheumatology clinics around the country, generally referred by physicians of other specialities. This is due to the deep-seated belief that the more we know about our patients, the better prepared we will be to respond to their request for treatment. Moreover, we will also be able to advise them properly as to how to alleviate or prevent the problems that cause osteoporosis, insofar as possible.

For the most part, patients seeking care at rheumatology clinics already have a diagnosis of osteoporosis. Some have had one or more fragility fractures and, in many cases, have not received appropriate treatment for their osteoporosis. In all likelihood, they have been treated only with calcium and vitamin D for a period of time and have been referred to a specialist because they have failed to achieve adequate response or because they have suffered a fracture.

It cannot be overemphasized that, since osteoporosis is such a common and predictable disease, because it is well known that one third of women over the age of 50 will have osteoporosis and since it can be prevented in a majority of cases, treatment and preventive measures should begin much sooner. Furthermore, attractive campaigns must be carried out to reach the entire population so as to encourage people to take measures to increase peak bone mass starting in adolescence, thereby making them responsible for their own bone health in an attempt to reduce the risk of osteoporosis.

In this study, we confirmed that the diagnosis of osteoporosis was made by bone densitometry in most patients. This enabled us to compare baseline densitometric values with those at the time of data collection, observing a significant increase in both lumbar spine and in the femoral neck. This finding probably corresponds to the initiation of treatment for osteoporosis in all these patients.

In the group studied, we observed that the presence of a positive family history of fracture doubled the risk of fragility fracture, which corroborates what was published in a meta-analysis carried out with a sample of close to 35,000 patients. The authors revealed that this association is independent of BMD values and that this risk is even greater when the family history of fracture involves the hip.7

The intake of calcium was insufficient in almost all the women in the study. Pérez et al. recently found that low calcium intake in Spanish women is commonplace,12 but the result of a meta-analysis indicates that intake of less than one glass of milk per day, does not appear to be associated with an increased risk of osteoporotic fracture.25

In the sample studied toxic habits were seen to be uncommon; nevertheless, this aspect must not be overlooked in the future, since we know that in the last several years, Spanish women have increased their consumption of alcohol and tobacco considerably; hence, it may be a risk factor to bear in mind as studies performed in both men and women have suggested.10

In general, the usual physical activity the post-menopausal women included in the study claimed to have might be sufficient for the older women, but not so in the case of the younger women. It appears that the importance of the physical activity osteoporosis patients get is underemphasized. Although still controversial, the results of a systematic review indicate that the combination of aerobic exercise, weights, and stamina exercises benefits the BMD of the spine and that aerobic exercise increases the BMD of the wrist in post-menopausal women.10 On the other hand, a meta-analysis recently conducted concludes that regular walking has positive effects on the bone mass of the femoral neck in post-menopausal women.26 Regular physical exercise is necessary to maintain the body’s flexibility, to maintain muscle strength, and to prevent falls. As patients age, so too does the probability of falls as observed in our study, which comprises one of the most important risk factors for fracture.

The average concentration of serum calcidiol in the women who participated in this study is slightly higher than what has been found in other studies performed in post-menopausal women in Spain, such as those attending a rheumatology clinic.
in predicting the probability of falls in seniors. Bearing the afore-
functions in seniors, decreasing reaction time and improving postural
D supplementation enhances neuromuscular and neuroprotective
are inversely associated with falls. A review of randomized,
concomitant pathologies.
consequences of calcidiol, predominantly in women over the age of
70, and a high incidence of back pain.

The great number of patients with vertebral fractures suffering
from chronic back pain is statistically relevant with respect to those
who have not suffered fractures, and this may be having quite a
considerable impact on their quality of life. Sudden onset back pain
characterized by intensity and consequential disability may be due to
severe vertebral fracture or deformity (decrease in the height of the
vertebra of 4 standard deviations or more, below the mean according
to the Osteoporotic Fractures Research Group). However, in patients
with vertebral fractures in this study, back pain was not necessarily
due solely to fractures, but might also have been caused by other
concomitant pathologies.

In conclusion, the profile of post-menopausal women with
osteoporosis in Spain seeking care at rheumatology clinics is
characterized by low intake of calcium, a positive family history
of fracture, a prior personal history of fractures, insufficient
concentrations of calcidiol, predominantly in women over the age of
70, and a high incidence of back pain.

Conflict of interest

None of the authors has any conflict of interests potentially
affecting the results of this paper.

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questionnaires that rheumatologists administered to patients all
over the country.

Annex

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this study at the participating rheumatology clinics:
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