

**Sosa Henríquez M y Grupo de Trabajo en Osteoporosis Canario (Ver anexo 1)**

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# Osteoporotic women with fractures show greater therapeutic compliance than those without fractures

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## Summary

**Background:** Fractures are a clinical complication of osteoporosis. Sufficient therapeutic compliance is necessary to reduce the risk of fracture. The literature suggests that a significant percentage of patients with osteoporosis soon abandon treatment, both drugs and calcium and vitamin D supplements.

**Objectives:** To study the degree of compliance with osteoporosis therapy in a population of women affected by the disease, with and without fragility fractures.

**Patients and method:** 413 women with a diagnosis of osteoporosis already established were included in the study consecutively, as they attended a health centre, without any selection or recruitment campaign.

**Results:** 38.6% of the women had suffered at least one fragility fracture, the most frequent being non-vertebral fractures as a whole, followed by vertebral fractures. Fractured patients had an average age 5 years older than those without fractures. The overall proportion of patients who were taking regular treatment was 66.1%, with the proportion of compliant patients being higher in those who had a fragility fracture, at 75.9% for those taking drugs in general and 84.1% for those taking calcium and vitamin D supplements, as against 59.7% and 68.4% respectively for those without fracture ( $p < 0.001$ ).

**Conclusions:** Those women affected by fragility fractures were older and had a greater adherence to treatment, both for drugs in general and for calcium and vitamin D supplements, than patients with osteoporosis without fractures. Non-vertebral fractures were those most commonly observed fractures.

**Key words:** osteoporosis, Primary care, fractures, treatment, compliance, calcium, vitamin D.

## Introduction

Osteoporosis is a highly prevalent disease which may be treated by different medical specialists, including family doctors.

Primary care doctors form the base of the National Health System (Systema Nacional de Salud) and are the main point of access for patients<sup>1</sup>.

The interest in and involvement of primary care doctors in the prevention diagnosis and treatment of osteoporosis is indicated both by the existence of working groups on this disease in their scientific societies, and by the scientific documents which they generate<sup>2-4</sup>.

However, there are questions regarding the treatment of osteoporosis which have not yet been resolved. One of these is that patients affected by osteoporosis and with fragility fractures are not indicated for treatment<sup>5,6</sup>. Another is that once indicated, the patients abandon treatment after a certain period of time, or do not follow the treatment correctly, which is to say that they have poor persistence or adherence<sup>7-13</sup>, which leads to an increase in the risk of fracture<sup>14,15</sup>.

We carried out this study in a population of patients previously diagnosed with osteoporosis and monitored by their primary care doctors, with the aim of understanding some of their clinical characteristics and the possible differences in their adherence to treatment, depending on whether or not they have fragility fractures.

## Patients and methods

### *Context of study and selection of patients*

All primary care doctors in all the health centres in the island of Gran Canaria participated in this study between 1st March and 30th September 2013. Their relationship is shown in Annex 1. The objective was to include 500 patients of both sexes affected by osteoporosis. In the end, 439 patients who met the inclusion criteria, and who had previously been diagnosed with osteoporosis, this diagnosis having been confirmed in their electronic primary care medical record, were recruited.

This study did not try to establish, confirm or question the diagnosis of osteoporosis, but this was accepted as an assumption, the diagnosis having taken place at another medical appointment. This could either have been in the primary care clinic of the same doctor, or through a referral to a specialist, either in specialist clinics (Centros de Atención Especializada [CAEs]) or to a hospital, mainly the Bone Metabolism Unit of the Island University Hospital (Hospital Universitario Insular).

Each doctor included their patients in the study as they attended the health centre, either for monitoring or review, without any selection. After informing the patient of the objectives of the study their informed consent was requested to include their data in a questionnaire designed for this purpose, a modification of the Prochasa-Diclemente test<sup>16</sup>.

The study was approved by the ethics committee of the Mother and Baby Island Hospital Complex (Complejo Hospitalario Insular Materno-

Infantil) and by the Medical Director for Primary Care of the Canarian Health Service (Dirección Médica de Atención Primaria del Servicio Canario de la Salud).

### *Statistical analysis*

The data obtained from the questionnaire were entered into a database in the SPSS (Statistical Package for the Social Sciences) programme. In each of the groups, defined by the presence/absence of fractures, the categorical variables were summarised as frequencies and percentages, and the numerical variables by mean and standard deviation. The percentages were compared using the chi-squared test, and the means using the t-test for independent data. Those variables which showed significance in the univariate analysis were entered into a multidimensional logistic analysis. A retrospective selection of variables based on the verisimilitude ratio test was carried out. The resulting model was summarised as p and odd-ratio values, which were estimated with intervals of confidence of 95%. The contrast of hypotheses was considered statistically significant when the corresponding p value was lower than 0.05.

## Results

A total of 500 patients participated in the study. Figure 1 shows the organogram of the patients who met the inclusion and exclusion criteria for this study.

Given the low number of males recorded, we decided to exclude them from our study, since we estimate that the results obtained when comparing such disparate sample sizes would not be very reliable.

In the end, 419 women were included, in whom we confirmed the existence of a fragility fracture in 166 (39.6%).

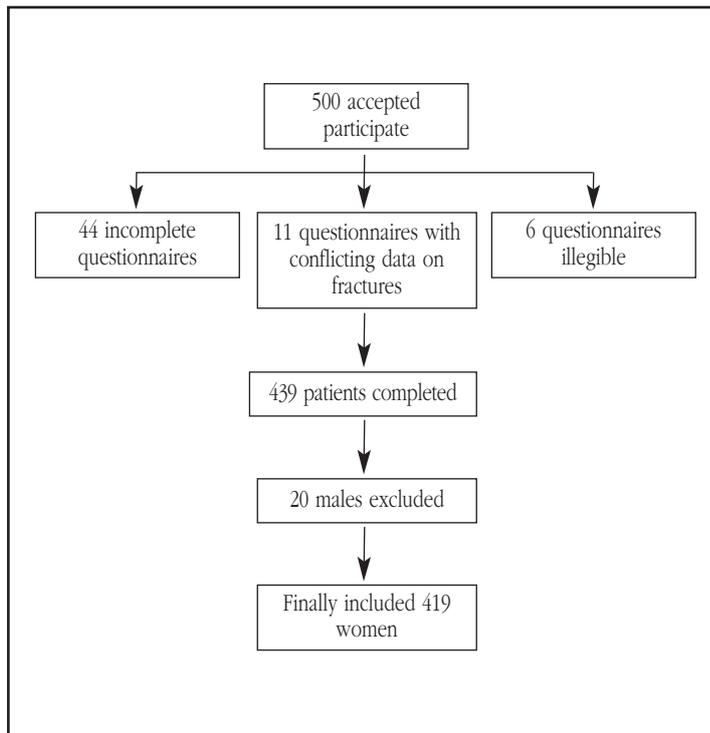
Table 1 records the clinical characteristics of the patients, classified according to the presence or absence of fractures. It was observed that the women with fractures were of greater age, an average of 5 years older than those without, 74 vs 69.8 years of age respectively,  $p < 0.001$ . The time passed since the diagnosis of the osteoporosis was similar in the two groups.

Only 66.1% of the women affected by osteoporosis, with or without fractures, were receiving treatment for this disease at the point of consultation. From among those were treated, the women with fractures were a significantly greater proportion than those who had no fractures (75.9% vs 59.7%,  $p = 0.001$ ).

The proportion of patients who received vitamin D and calcium supplements was higher than those receiving other drugs, with almost 75% of the women with osteoporosis receiving these supplements, the proportion of fractured women treated again being higher than those without fractures (84.1% with as against 68.4% of those without fracture,  $p < 0.001$ ).

With respect to the distribution of fractures, the non-vertebral fractures were the most frequent

Figure 1. Organogram of patients who met the inclusion and exclusion criteria in this study



(38.6%), followed by vertebral fractures, which made up 24.1% of the total of fractures. In this series 22.8% had had more than one fracture, whether they were vertebral or non-vertebral. Lastly, the most common non-vertebral fracture was the Colles fracture at 13.3%.

In carrying out a multidimensional logistic analysis (Table 2), we found that only 2 variables were statistically significantly associated with the presence of fragility fractures, which were age and the current consumption of calcium and vitamin D.

## Discussion

Our study was aimed at trying to understand some of the clinical characteristics and degree of compliance with treatment in a population of patients of both sexes affected by osteoporosis in primary care. To achieve this, the design was intended to gather data from 500 patients diagnosed with osteoporosis, who attended the health centre for themselves, itself. None of the patients were called to be included on the study.

We were therefore surprised by the low number of male participants, with only 20 out of a total of 500 included initially. This led us to exclude them from the subsequent statistical studies, since comparisons made between such disparate sample sizes seemed to us not to be reliable.

For us, this finding confirms one of the facts observed in the field of osteoporosis, which is that males are probably underdiagnosed and that they make up a smaller proportion of cases than

women<sup>17-19</sup>, in spite of the fact that osteoporosis affects, although not to the same extent, both sexes<sup>17-20</sup>. The average age of all the patients with osteoporosis was 71.5 years. In addition, the women with fractures were older than those without (74 vs 69.8 years of age), all of which confirms that osteoporosis is a disease which affects older women<sup>21-23</sup>, in whom, on our opinion, both preventative and therapeutic activities should be focused. Given that fragility fractures are a clinical complication of osteoporosis, treatment should be aimed at preventing its appearance, be it for the first time or as re-fractures<sup>21-24</sup>. To achieve this aim, it is essential that patients carry out the treatment correctly, since no drug reduces completely the risk of new fractures and, furthermore, it has been observed that when patients do not take their medication correctly protection against fracture is reduced<sup>9,14</sup>.

So, our findings are moderately optimistic since 66.1% of the patients with osteoporosis were receiving treatment at the time of completion of the survey, this being higher among those who had suffered a fragility fracture, reaching 75.9%, a statistically significant difference. Similar and even better results were observed with calcium and vitamin D supplements, with 74.6% of all those women affected by osteoporosis taking these supplements at the time of the interview, increasing to 84.1% in the case of patients with fractures, the difference again being statistically significant. Classically, it has been reported that patients affected by osteoporosis, in general, complied poorly with treatment, both with anti-resorptive drugs<sup>7,8,120-12</sup>, especially the bisphosphonates<sup>12,13</sup>, and with the anabolics<sup>25</sup>, and in a more fundamental way, with calcium and vitamin D supplements<sup>26,27</sup>. In some series it has been reported that the first thing that patients stop taking correctly is precisely calcium and vitamin D<sup>28</sup>, which is exactly the opposite to what we found in our study, where 84.1% of the fractured patients took calcium and vitamin D, while only 75.9% took any other drug.

The patients had suffered a fragility fracture in 39.6% of cases (Table 3), and of these, the most common fractures were non-vertebral, which were recorded in 38.6% of these patients, followed by vertebral fractures (24.1%). We have separated the hip fractures from the non-vertebral fractures, and have grouped these in a different section since we believe that due to their mortality and morbidity they should not be included in the same group as, for example, fractures of the rib. We should highlight the fact that 22.8% of the patients had suffered various fractures, vertebral and non-vertebral combined.

Table 1. Clinical characteristics of patients included in the study, classified by the presence or absence of fractures

Variable	Total N=419	Fractures N=166 (39.6%)	No fractured N=253 (60.4%)	Value of P
Age (years)	71.5±10.2	74.0±9.5	69.8±10.3	<0.001
Time since diagnosis of osteoporosis (years)	6.1±3.5	6.1±3.5	6.1±3.5	0.980
Currently receiving treatment	277 (66.1%)	126 (75.9%)	151 (59.7%)	0.001
Take calcium and vitamin D today	309 (74.6%)	138 (84.1%)	171 (68.4%)	<0.001

Table 2. Multidimensional logistic analysis

	P value	OR (IC 95%)
Age, per year	<0.001	1.049 (1.027;1.072)
Currently taking calcium and vitamin D	<0.001	2.758 (1.651;4.610)

Finally, the multidimensional logistic analysis, which is shown in Table 2, identified the variables associated with the existence of fractures within the population studied. We found, in first place, age, which is an all too well-known fact. Fragility fractures, even though they can be observed at any age, are more frequent the older the patient. The other data obtained was the current intake of calcium and vitamin D, which we believe is a consequence and not a cause, and that precisely due to their having suffered a fragility fracture the patients were better at taking the calcium and vitamin D treatment.

Our study has some limitations. Firstly, we could only included a small number of males, as has already been mentioned, having had, therefore, to restrict the study to women. Another limitation is not having estimated more precisely the adherence and persistence of the patients, using, for example the Morisky scale<sup>29</sup>. And lastly, a description of the different drugs used was not included in the design of the study. However, one of its strengths is that we have been able to carry out one of the first co-operative studies between primary care, hospital care (Bone Metabolism Unit) and the University of Las Palmas Gran Canaria, which has enabled us to consolidate the Canarian working group on osteoporosis.

In summary, adherence to treatments for osteoporosis in the population studied, is acceptably high, and is higher in women who have suffered a fragility fracture.

#### Annex 1. Members of the Working Group on osteoporosis canary

Noemí Vega Rodríguez, Teresa Ramírez Lorenzo, Pedro Saavedra Santana, Caridad Sánchez Artiles, Antonia Rodríguez Hernández, María Carmen Suárez Cabello, Isabel Travesí García, Vanessa Díaz González, Erika Méndez Owen, Esther Rojas García, Dulce Suárez Casañas, José Fco. Lobato González, Ana Lezcano Melián, Purificación Alguacil Martínez, Yolanda Angulo Rodríguez, Alejandro Suárez Marrero, José Manuel Castillo Anzala, Antonio García Mendoza, María Jesús Arce Díez, Nuria Juma Parrado, María Gabriela Valido Socorro, Teresa Alcaide Ibáñez, Sonia María Arencibia Peñate, Gloria Calero González, Rafaela García Rodríguez, Belkys Jiménez Vila, Rosa Delia Reyes Ortega, Andrés Ballesta Albolea, Zoraida González, Pilar Medina Martín, José Rosales Pérez, Lourdes Vega Torres, Antonina Montesdeoca Naranjo, Roberto Ramírez Pérez, Elena Díaz-Valero López, Juan Carlos Medina Sánchez, Sara María Mohatar Amed y Beatriz Pérez López.

Table 3. Distribution of fractures

Fracture type	N (%)
Vertebral	40 (24.1)
Hip	24 (14.5)
Non-vertebrals*	64 (38.6)
Colles	22 (13.3)
Humerus	13 (7.8)
Other	29 (17.5)
Various**	38 (22.8)

\* Includes those patients with a vertebral fracture than hip or.

\*\* Included patients with multiple fractures of any type: vertebral, non-vertebral or hip.

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