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# Knowledge of osteoporosis, and the pharmaceutical expenditure it entails, in the primary health care system of the Canary Islands

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## Summary

*Background:* Osteoporosis is a disease which can be managed by different specialisms, one of which is the family doctor. In this study we analyse the knowledge of osteoporosis, and the diagnostic and therapeutic approach taken to this disease, among primary care doctors in the Canarian archipelago, as well as making a first approximation of the expenditure on drugs used to treat this disease in 2013.

*Material and method:* Observational, descriptive, transverse study conducted between May 2013 and May 2014 with all primary care doctors in the Canarian health service. An anonymous survey covering 13 points was developed. The capture of the data about expenditure on drugs was facilitated by the service for the control of supply and rational use of medicines of the Canarian health service.

*Results:* 28.60% of primary care doctors in the Canarian archipelago responded to the survey. Of these, 75.30% reported using risk factors in evaluating the risk of fractures. Not a very high percentage, approximately half of the respondents, request densitometries, while 28.60% routinely use scales for the evaluation of risk of fracture and 32.80% use them occasionally. 90% of the professionals recommend non-pharmacological measures for the prevention of fractures in their patients, although 91% do not normally request a determination of blood levels of vitamin D.

In 2013 the expenditure on drugs for osteoporosis by the Canarian health service amounted to € 7,684,393.61, of which € 7,265,491.06 was in primary care.

*Conclusions:* The Canarian primary care doctors who responded to the survey had, in general, a good knowledge of osteoporosis, and of its risk factors, but focussed their professional activity more on prevention than treatment. The drug most commonly used in the treatment of osteoporosis in primary care is risedronate. Expenditure on drugs for osteoporosis in the Canarian archipelago in 2013 amounted to € 7,684,393.61, 94% of which was in primary care.

**Key words:** *osteoporosis, primary care, doctor, knowledge, drug expenditure.*

## Introduction

The medical specialisms which manage osteoporosis, their approach, diagnosis and treatment, are highly heterogeneous[1]. There are patients who remain without treatment in spite of being at high risk of fracture, while others receive medication solely on the basis of a bone densitometry, and some with neither prior densitometry or risk evaluation. It is essential to differentiate between those patients with a higher risk of fracture who will benefit from pharmacological treatment, with the aim of optimising interventions to ensure a positive risk-benefit relationship. To achieve this, different instruments have been developed which estimate the risk of fractures based on risk factors, among which are software applications FRAX®[2,3] and Qfracture®[4], which allow the estimation of the risk over 10 years of a major fracture (any fragility fracture) or specifically fracture of the hip. Many patients with osteoporosis attend primary care clinics, which means that family doctors should have sufficient skills and diagnostic tools to deal with these patients. However, we found great variability in the application of the FRAX®[2,3] and Qfracture®[4] tools, as well as between the different national and international guides for the management of osteoporosis[5-7].

Few studies exist in Spain as to the degree of knowledge primary care doctors have about osteoporosis, although they are one of the fundamental pillars of care for patients with osteoporosis. Furthermore, there are no current studies in the autonomous community of the Canary Islands to enable the evaluation of the actions of its professionals and the degree to which the aforementioned risk scales are utilised.

The main objective of this study was to obtain a first approximation of the extent of the knowledge of osteoporosis, and of the approach, diagnosis and treatment of this disease in doctors working in primary care in the Canarian health service, as well as estimating the expenditure incurred in primary care on drugs used for the treatment of this disease during the year 2013.

## Material and method

Observational, descriptive, transverse study carried out between May 2013 and May 2014 of all primary care doctors in the Canarian health service.

An anonymous self-completed survey covering 13 items was developed (Annex 1), which asked questions about the knowledge and attitudes of professionals in dealing with osteoporosis. The survey was designed by the authors of this article. Using data provided by the primary care administration of the Canarian health service in Tenerife, the survey was sent by email to the directors of all the health centres in the Canarian archipelago, enabling it to reach anonymously the 1,168 family doctors who were working at that time in primary care. The completed surveys were returned by email to the authors of this article, indicating which to which health centre they belonged.

The study was evaluated and authorised by the research section of the primary care administration in Tenerife. All the data obtained were treated confidentially.

To estimate the expenditure on drugs used for the treatment of osteoporosis we requested the data regarding this expenditure during 2013 from the service for the control of supply and rational use of medicines, in the general directorate for assistance programmes of the Canarian health service. This service sent us three spreadsheets in Excel 2007: the first, entitled "Indicator", contained two tables, one which specified the percentage use of drugs of first choice for osteoporosis in each of the hospitals in the Canaries, and the other in which are indicated their use in each of the seven primary care administrations. The second spreadsheet, which is entitled "Consumption", contains three tables which specify the drugs by active ingredient, by number of packets and expenditure in euros (the first table in which was not known where expenditure originated, the second table with the expenditure incurred by specialist care, both in number of packets and euros, and a third with the expenditure incurred by primary care). Lastly, a third spreadsheet called "Total Consumption" in which we include a table which specifies the names of the medicines and the total consumption in both specialised and primary care, both in packets and in euros.

The codification of the data was carried out with the SPSS (Statistical Package for the Social Sciences) program version 21 for which we held the appropriate licences.

## Results

Of the 1,168 doctors in primary care invited to participate in the study, a total of 332 responded to the questionnaire, which is 28.6% of all such doctors in the Canarian archipelago. The distribution of doctors who responded to the questionnaire by island is shown in Table 1. The islands with the highest percentage of respondents were El Hierro and Tenerife.

The percentages for each response to each item are shown in Table 2. To the question as to whether the professional considers risk factors in the appearance of fractures (item 1), 75.30% said they usually considered them and 21.10% occasionally. Only 3% of respondents did not consider these factors in their consultation.

In relation to the use of densitometry for screening during the menopause (item 2), 72.30% did not use it for screening and 16.60% used it only sporadically. Densitometry to monitor osteoporosis in treatment was only requested by half the professionals who responded (item 3). On the other hand, we found that 14.80% confirmed their use of conventional radiography as a method for diagnosing osteoporosis, 30.70% used it occasionally and 51.50% did not use it at all for diagnosis (item 13).

91% of the professionals who responded recommend non-pharmacological measures for the prevention of fractures in their patients, as opposed to 1.20% who did not recommend any measures and 7.80% who said that they sometimes did so (item 4).

44% of the doctors do not routinely monitor the height of their patients, and only 24.40% usually do so (item 5). In spite of this, 51% of respondents said that they had requested X-rays of the lumbar spine in cases of a reduction in height (item 6).

In relation to the use of scales for the evaluation of risk of fracture, 28.60% said that they did so routinely and 32.80% occasionally. 38% do not use scales for this pathology in their clinic (item 7).

In cases in which fragility fractures are detected, 70.20% of the doctors responding requested a complementary test (although the question did not specify which), 13.60% requested no such test and 15.10% only requested one occasionally (item 8).

91% of respondents did not routinely request a test for vitamin D levels in the monitoring of patients with osteoporosis or at risk of fractures (item 9). 83.70% said they ensured a good supply of calcium and vitamin D as a function of age, sex and other related factors (item 10).

To find out which is the drug most used in the first instance for the treatment of osteoporosis , an open question was posed in which the professionals could explain which treatment they considered to be the first choice for their patients (item 11). The responses were grouped in 10 categories whose distribution can be seen in Table 3.

The duration of treatment with bisphosphonates was checked in 85.20% of cases, while 12% of those responding do not do so (item 12). Lastly, in relation to the data obtained from the service for the rational use of medicines[8], in the year 2013 the expenditure on medicines for osteoporosis in the Canarian health service[8] totalled € 7,684,393.61.

In primary care the expenditure was € 7,265,491.06, the top drug prescribed being risedronic acid, followed by ibandronic acid (Figures 1 and 2). It should be clarified that included within the figure for expenditure in primary care is the expenditure originating both in prescriptions from primary care, as well as those from specialised care. With reference to drugs which should be used as first choice for the treatment with osteoporosis, in primary care these represented 13.71%.

## Discussion

The family doctor is an essential pillar of support for the care of osteoporosis in all its aspects: preventative, educative and therapeutic. For this reason they need to be capable of identifying the population at highest risk of osteoporotic fracture in the early silent phase, before the first fracture appears[9].

Osteoporosis is an asymptomatic disease which is difficult to diagnose in the absence of a fracture[10,11]. And even if there are fractures, these often do not produce symptoms. A number of authors have indicated that is it important that the doctor has adequate diagnostic methods at their disposal, but it is also necessary that they have the correct information regarding the treatment of this disease[12-15]. In Spain, until the publication of the first guide to osteoporosis by the semFYC[16], the study of this disease in primary care was not well documented, neither was it included in the programme of preventative and health promotion activities. In the ABOPAP 2000 study carried out in Spain[17], the approach to osteoporosis in primary care was studied. Notable among the results of this study was the fact that around a quarter of doctors had access to bone densitometry, whereas around 50% said that they continued to study patients suspected of having osteoporosis. It is also interesting that screening for risk factors is lower than expected in certain risk situations, such as family history of osteoporosis or hip fracture, chronic treatment with glucocorticoids, etc. As was expected, those doctors who had available the best diagnostic tools also carried out greater screening for risk factors[18].

Table 1. Distribution of primary care physicians (in percentage) who answered surveys on each island of the Canary Islands

| | |
|---|---|
| Tenerife | 53.54% |
| Fuerteventura | 40.74% |
| Gran Canaria | 3.74% |
| Hierro | 87.5% |
| Lanzarote | 22.78% |
| La Gomera | 35.29% |
| La Palma | 8.16% |

Another study published in Spain[19], which analysed approaches to osteoporosis in a primary health care centre concluded that the family doctors rarely complied with directives emanating from guides to diagnosis and treatment.

In this study, according to the results from the doctors surveyed, we are able to say that, in general, what primary care doctors in the Canaries carry out best is prevention, which is shown in the high percentage of those who responded who took into account risk factors (96.40%), ensured a good intake of calcium and vitamin D (83.70%) and routinely applied non-pharmacological measures to the general population (90%).

Even so, it is notable that only 61.40% said that they used risk factor scales to a greater or lesser extent. Given the simplicity of the tests, they could be of general use in primary care. It is possible that these staff are not yet convinced by the assessment of risk factors, perhaps due to the risk scales not being completely accepted consensually among researchers.

On the other hand, 71.60% of the doctors who responded did not measure patients' heights in their clinic. This is contradictory since this data is necessary when using the scales. We raise the question as to whether doctors really take into account height or not, since this parameter is measured by the nurse, and in the survey we do not ask who measured it. This may also reflect a lack of knowledge on the part of many staff of the significance of loss of height as an indicator of vertebral fracture.

Table 2. Percentage of responses on each item

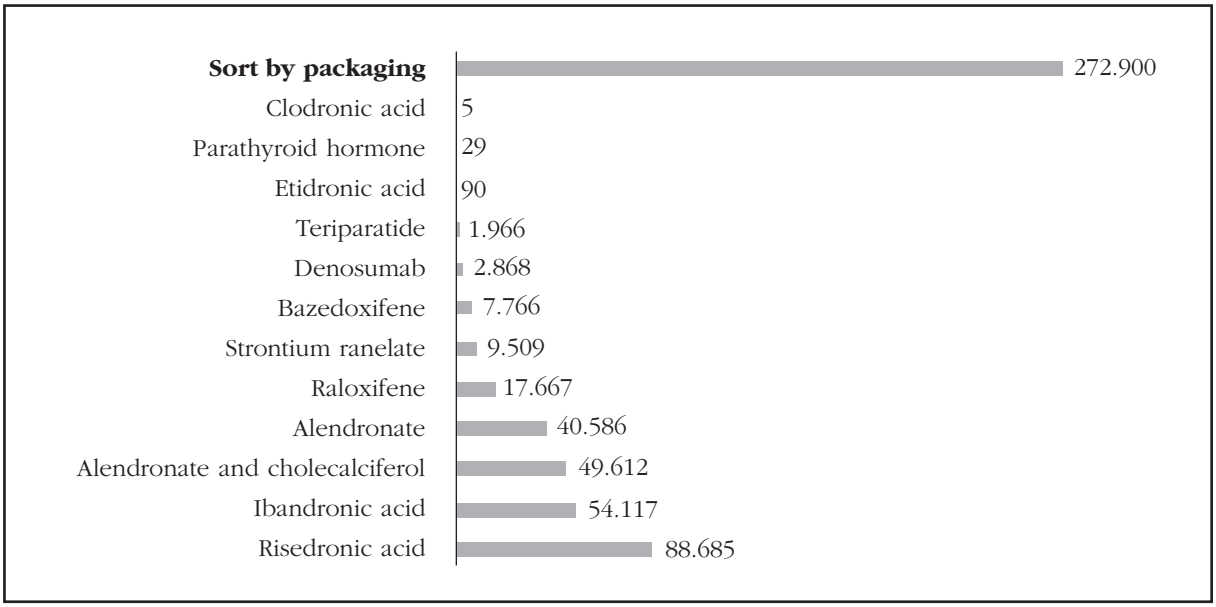
| Question | Yes | No | Sometimes | No answer |
|---|---|---|---|---|
| 1. Do you consider risk factors? | 75.30% | 3% | 21.10% | % |
| 2. Are you applying densitometry screening? | 11.10% | 72.30% | 16.60% | 0% |
| 3. Are you applying densitometry in osteoporosis treatment every two years? | 50.90% | 46.10% | NE | 3% |
| 4. Do you apply nonpharmacological measures? | 91% | 1.20% | 7.80% | 0% |
| 5. Do you measure the size in question? | 24.40% | 44% | 31.60% | 0% |
| 6. If decrease in size, do you ask radiograph? | 51.20% | 44.90% | NE | 3.90% |
| 7. Do you use scales to assess the risk of fragility fracture? | 28.60% | 38% | 32.80% | 0.60% |
| 8. If fragility fracture, other proof do you ask? | 70.20% | 13.60% | 15.10% | 1.20% |
| 9. Are you applying vitamin D? | 8.40% | 91% | NE | 0.60% |
| 10. Do you ensure the intake of calcium and vitamin D? | 83.70% | 13.90% | 0.30% | 2.10% |
| 11. What is the drug most commonly used primarily for the treatment of osteoporosis? | The responses were grouped in 10 categories, distributed as shown in Table 3 | | | |
| 12. Do you review the years taking bisphosphonates? | 85.20% | 12% | 0.30% | 2.40% |
| 13. Do you use X-rays to diagnose osteoporosis? | 14.80% | 51.50% | 30.70% | 3% |

Table 3. Drugs used by physicians who responded to the survey

| Therapeutic group | Nº | % |
|---|---|---|
| Bisphosphonates | 127 | 38.25 |
| Calcium/vitamin D + bisphosphonates | 69 | 20.78 |
| Calcium/vitamin D | 43 | 12.95 |
| Non-pharmacological measures | 10 | 3.01 |
| Non-pharmacological measures, calcium/vitamin D + bisphosphonates | 7 | 2.11 |
| Non-pharmacological measures, calcium/vitamin D | 6 | 1.81 |
| Other treatments for osteoporosis | 5 | 1.51 |
| Otros tratamientos para osteoporosis | 3 | 0.90 |
| No specific treatment | 14 | 4.22 |
| Unanswered | 48 | 14.46 |
| Total | 332 | 100 |

Another point of note is that 91% of doctors do not request a vitamin D test in patients with osteoporosis or at risk of fracture, so we believe either that there is a lack of knowledge of the usefulness of such a test, or that there is an administrative difficulty in requesting one, although the fact that 83.70% said that they ensured a sufficient supply of vitamin D to their patients inclines us to the second explanation. In terms of the diagnosis, it is notable that nearly 50% used X-rays, occasionally or routinely, to diagnose osteoporosis. And, if a reduction in height is detected, only 50% request a spinal X-ray. This leads us to suspect that there is an under-diagnosis of possible vertebral fractures, and in some way corroborates the possibility of a lack of knowledge about the loss of height as being indicative of vertebral fracture as has been pointed out before. Furthermore, according to the results, if a doctor were to detect a fragility fracture 28.70% would not, or would only occasionally,

Figure 1. Pharmaceutical expenditure on medicines for osteoporosis, in 2013, ordered by packaging made by Primary Care in the Canarian Health Service




request a complementary test. In this respect, the low use of bone densitometry may reveal the difficulty primary care doctors have in accessing this diagnostic test.

In terms of the prescribed treatment, most responded saying that they use bisphosphonates, and in second place, the same drugs, associated with calcium and vitamin D. Fewer than 10 doctors responded that the treatment depended on the age of the patient and associated risk factors.

Various studies in primary care have been conducted in our country regarding the applicability of the FRAX© tool[2,3] to determine the absolute risk of fracture in postmenopausal women and, as a function of the results, to consider recommendations in relation to the convenience of requesting of bone densitometry and/or of initiating treatment with antiresorptives[20,21].

Patient care overload, combined with the large amount of knowledge which the family doctor needs to carry out their daily tasks, means that osteoporosis is seen as a priority, or not, according to the preferences of each doctor. To this can be added the lack of unanimity in the guides available at the time of requesting a bone densitometry and, above all, when defining which patient to treat[17].

The main objective of this work is to obtain a first approximation for the understanding and management of osteoporosis by primary care doctors in the Canary Islands, so that once the reality is known, attempts can be made to increase the use of tools for the evaluation of risk of fracture, to reduce the use of tests and treatments in low risk patients and to increase the use of these resources in those at high risk, hence seeking the most efficient use of resources. It is certain that a significant limitation of the study was that the percentage of doctors who answered the survey was less than was hoped for, but we may consider them a representative sample of primary care doctors in the Canary Islands. It is possible that those who completed the questionnaire were those most involved in the disease, for one reason or another, and if we take this into account (as well as the chronic lack of time which staff in primary care possess) the percentage of responses is satisfactory. Other limitations of the study are: firstly, that the survey used had not been validated by other researchers, given that we could not find any survey which could be adjusted to the objectives of this study; and secondly, in some of the smaller islands it is not possible to request densitometry, which means that the response to whether densitometry was requested every two years for screening, and if densitometry for monitoring is requested, could be biased.

## Conclusions

Our results show that primary care doctors in the Canary Islands who responded to the questionnaire consider prevention of osteoporosis as part of their work, whereas they show less knowledge and determination, as well as having fewer means available, in relation to the diagnosis and treatment of the disease.

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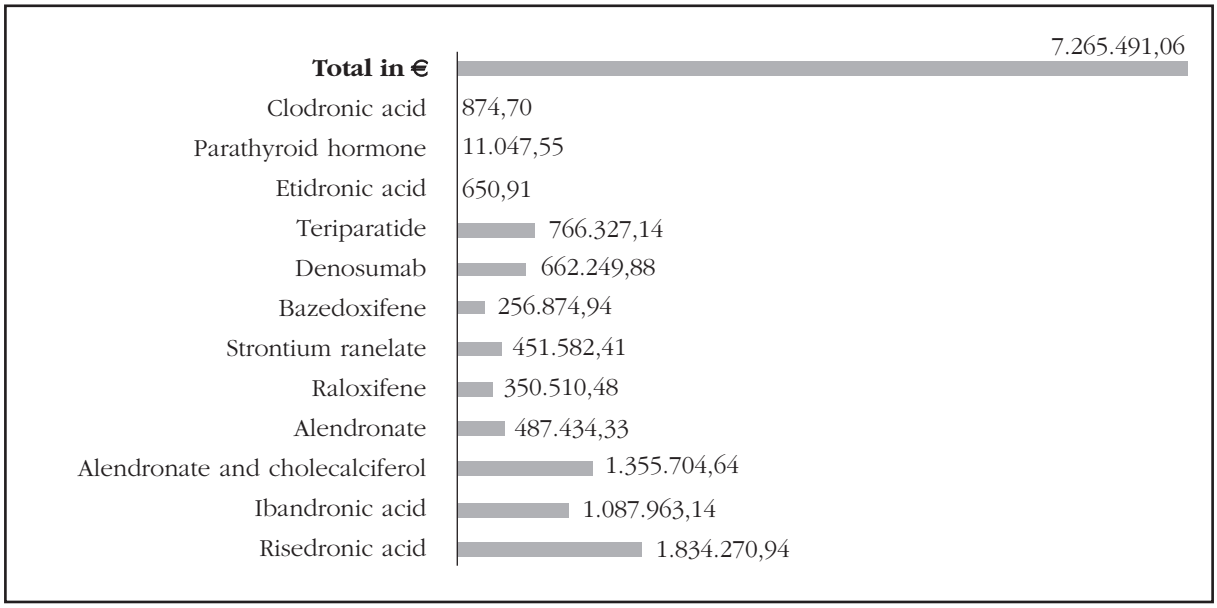
Figure 2. Pharmaceutical expenditure on medicines for osteoporosis in 2013, in euros (€) by Primary Care Health Service Canario

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Annex I. Survey data collection

| **Knowledge about osteoporotic fractures in primary care professionals** |
|---|
| 1) Do you consider all risk factors for fracture: age, personal history of fracture, risk of falls and use of corticosteroids, as usual in the query?<br>☐ YES ☐ No ☐ SOMETIMES |
| 2) Are you applying routinely densitometry, screening for all postmenopausal women?<br>☐ YES ☐ No ☐ SOMETIMES |
| 3) Are you applying control densitometry every two years in patients with osteoporosis treated?<br>☐ YES ☐ No |
| 4) Do you apply nonpharmacological measures the general population routinely: no smoking, no drinking, physical exercise regularly, diet rich in calcium?<br>☐ YES ☐ No ☐ SOMETIMES |
| 5) Do you measure regularly in consultation up to their patients?<br>☐ YES ☐ No ☐ SOMETIMES |
| 6) In case of decreasing size do you ask x-thoracic and lumbar spine?<br>☐ YES ☐ No |
| 7) Do you use any scale (FRAX, QFracture) to assess the risk of fragility fracture?<br>☐ YES ☐ No ☐ SOMETIMES |
| 8) In case you are facing a fragility fracture patient with some complementary test do you ask?<br>☐ YES ☐ No ☐ SOMETIMES |
| 9) Are you applying vitamin D levels routinely?<br>☐ YES ☐ No |
| 10) Do you ensure good calcium intake as needed (depending on age, sex, ...) and vitamin D?<br>☐ YES ☐ No |
| 11) What treatment for osteoporosis using home? |
| 12) In patients taking bisphosphonates Do you regularly check how many years have you been taking it?<br>☐ YES ☐ No |
| 13) Do you use radiography as a method to diagnose osteoporosis?<br>☐ YES ☐ No ☐ SOMETIMES |