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Antiresorptive treatment, when initiated after a first hip fracture, may not protect of a second contralateral episode in elderly population: A study with 685 patients

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ABSTRACT

Introduction: Osteoporosis predisposes for a higher risk of hip fracture and its treatment is frequently underprescribed. Our purpose was to assess the relation between having a second hip fracture and receiving osteoporosis treatment. Also to assess the relation between this second fracture and using central nervous system drugs or being institutionalised.

Patients and methods: We reviewed all the patients that were admitted to our hospital with an osteoporotic proximal femoral fracture between September 2009 and February 2011. We identified 685 patients, 74 of which presented a contralateral fracture. We evaluated if they were receiving osteoporosis treatment or taking any medication that could affect the central nervous system and if they were institutionalised.

Results: A 10.8% of patients had a second fracture and the mean time between the two of them was 20 months (1–122). There was a clear female predominance (76.35%). The mean age at occurrence of the primary fracture was 83.02 years and 85 for the second. A 90.8% did not follow any type of osteoporosis medication before the first fracture. A 50.9% did not receive central nervous system drugs and 79.1% lived at home at the time of the first fracture. 12.8% of the patients that did not follow the osteoporosis treatment, had a contralateral fracture, 3% more than those that did follow some kind of treatment, but this difference was not significant ($p = 0.2$).

Discussion: We identified a similar number of patients undergoing osteoporotic treatment as registered in literature. There was no significant difference between suffering a second hip fracture and following osteoporosis treatment, using psychotropic drugs or being institutionalised.

Introduction

Femur fractures in the elderly patients are a prevalent pathology and approximately 85% of all fractures occur in people over 65 years old [1,2]. This type of fractures have an important morbimortality and can seriously affect their mobility and social independence, with only 30–40% of the patients recovering to their previous functional state, while many other will be disabled, requiring full day assistance [3–5]. These fractures also produce an important impact in sanitary, social and economic resources. In Spain, for example, the mean cost of a hip fracture is 9936€, including surgical and medical treatment, outpatient department visits, physical rehabilitation and social assistance [6].

The incidence of a second hip fracture is high and can vary, from 2% to 20%, and the risk of a second hip fracture increases with age [7–11]. These second hip fractures have a significant increase of early complications and only 60–70% of the patients that re-fracture will walk again [12]. A lot of data has been published regarding a first femur fracture, but less is known about the patients that suffer a second one [10,13].

Accordingly, primary and secondary prevention should be assessed to decrease these second fractures. Osteoporosis predisposes for a higher risk of hip fracture and its treatment is frequently underprescribed [14,15]. Some authors suggest that not only does this medication decrease the incidence of the first fracture (38% reduction in the hip fracture rate and relative hazard for hip fracture for alendronate versus placebo of 0.49) [16,17], but it also has a negative risk association to develop a second hip fracture [18].

On the other hand, the patients that receive benzodiazepines, opioid derivatives and other psychotropic drugs, are at risk of

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accidental falls and, consequently, of hip fractures [19,20]. The consumption of this type of medication in elderly population is high [21].

Another risk factor for a second hip fracture is the fact of living in institutions and not at home [22].

To our knowledge, there are no studies in our area that establish if dealing with these risk factors decrease the incidence of contralateral hip fractures.

The aim of our study was to assess the relation between following a treatment for osteoporosis and suffering a second hip fracture.

Our secondary aims were to asses this relation with the fact of consuming medication that could affect the CNS or living in a nursing home.

Patients and methods

We retrospectively analysed all patients that were admitted in our hospital with a proximal femur fracture between September 2009 and February 2011, using the database in our centre. Proximal femur fractures were considered as those with a neck or an intertrochanteric pattern. High energy trauma, pathological oncologic and periprosthetic fractures were excluded.

There were a total of 685 patients. We reviewed their digital and paper medical history, and if these patients had suffered a second contralateral hip fracture. We included age, sex, laterality, surgical treatment performed (cannulated screws fixation, monopolar prosthesis, bipolar prosthesis, total hip arthroplasty, sliding hip screw, intramedulary short or long nail), and the time between fractures. We also registered if the patients were receiving any type of treatment of osteoporosis (either with calcium and vitamin D supplements exclusively, or also with antiresorptive drugs like bisphosphonates, calcitonin or selective oestrogen receptor modulators). Additionally we reported if these patients were taking central nervous system (CNS) drugs like benzodiazepines (diazepam, lormetazepam, alprazolam, lorazepam), neuroleptics (haloperidol, risperidone, quetiapine), opioid derivatives (fentanyl, tramadol), hypnotics (clometiazol) or several drugs at a time; as well as the place where they lived: family house or in some king of institution (nursing home, residence, etc.).

This data was analysed by the Statistics Department in our centre. We developed a descriptive analysis as well as contingency tables to assess the relation between following the previously mentioned treatments or living in an institution and suffering a second hip fracture. We performed these analysis using the Chi square and T student tests.

Results

During 17 months we registered 685 admissions for proximal femoral fractures, 74 of which were admitted for a second contralateral hip fracture (10.8%). There was a clear female predominance (76.4%) and the mean time between fractures was 20 months (1–122), 59.4% occurring in the first 24 months. The average age for the first fracture was 83 years old (SD 8.59) and 85.5 (SD 7.02) for the second (Table 1).

Before the primary fracture, 90.8% of the patients did not follow any type of treatment for osteoporosis (not even calcium or vitamin D supplements nor antiresorptive medicine). At the time of the first fracture, this percentage dropped to 43.9%. Most of the patients (29.6%) received treatment only with calcium and vitamin D supplements, in comparison to the 25.1% that also took antiresorptive drugs. We observed that 12.8% of the patients that did not follow these treatments had a second contralateral hip fracture, 3% more than those that did follow osteoporosis treatment (9.6%), but this difference was not statistically significant ($p = 0.2$). Neither did this reach significance when we separated the treatment into calcium and vitamin D or antiresorptive treatment ($p = 0.22$) (Table 2).

Table 1
Contralateral hip fractures: epidemiologic data.

	2nd hip fracture	1st hip fracture
Age	85.5 (±7.02)	83 (±8.59)
Sex	21.6% male, 78.4% female	23.64% male, 76.35% female
Fracture type	45.9% intracapsular; 54.1% extracapsular	41.5% intracapsular; 58.5% extracapsular

Table 2
Variable breakdown.

	2nd hip fracture	No 2nd hip fracture	p
Osteoporosis treatment (antiresortive, D vit and calcium alone)	48.2% (28.6%, 19.6%)	56.1% (25.1%, 29.6%)	0.222
Treatment that affects CNS	45.3%	49.1%	0.594
Living at home	78.1%	79.1%	0.086

At the time of the first fracture most of the patients received benzodiazepines (24.7%) or multiple CNS drugs (14.1%). At the time of the second hip fracture 45% of the patients followed some kind of treatment in comparison with the 49.1% of patients which had only suffered one fracture this difference was not statistical significant ($p = 0.59$). Assessing each type of drug separately the patients that suffered a second hip fracture consumed less drugs related to the CNS, than those with a single fracture (3.8–7.2% for neuroleptics, 0–2.5% for opioid derivatives, 0–1.2% for hypnotics); except for benzodiazepines which were consumed a 3.6% more. However, again these differences did not reach statistical significance ($p = 0.39$).

Most of the patients lived at home at the time of the first (79.1%) and second fracture (78.1%). Patients that lived institutionalised had a lower percentage of second fractures (6.8%), in relation to those who lived at home (11.8%) but again, this difference was not statistically significant ($p > 0.05$).

Discussion

In our study we observed 10.8% of contralateral successive hip fracture, a similar percentage as reflected in recent literature (4.3–13%) [4,23–27].

This figure is probably due to the high percentage of population over 65 years old in our area [28].

Among the different stages on which we can act on to prevent proximal femur fractures, are those to complement the elderly's diet with calcium and vitamin D supplements because, even though these elements have not been proven to have a protective effect over osteoporotic fractures, they are one of the mainstay of the osteoporosis treatment. We must outline that there is a high deficiency of vitamin D in the Spanish population, making it even more recommendable to develop strategies for its correction [29].

Antiresorptive treatment

Various studies point out that the antiresorptive treatment not only increases bone mineral density in the hip and decreases bone remodelling, but could also protect of osteoporotic fractures (vertebrae and proximal femur); being the treatment with alendronate one of the best tolerated by the patients [29].