Original article

Management of osteoporosis in women after forearm fracture: Data from a French health insurance database

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ABSTRACT

Introduction: Despite reliable diagnostic methods and effective drugs, the prevention and management of osteoporosis seems insufficient in France. We evaluated bone mineral density (BMD) assessment and prescription of anti-osteoporotic drugs after forearm fracture in women.
Methods: We used a health insurance database for outpatients from private clinics in a French population of more than 500,000 inhabitants. Medical expenses were analyzed for women 50 years of age or older who had a forearm fracture between August 1, 2010 and June 30, 2012.
Results: We identified 250 forearm fractures in women during the study period. In total, 12 women (4.8%) underwent BMD assessment before the fracture and were not taken into account in the analysis. For the 238 others, 24 (10.1%) had undergone BMD assessment at a median of 4 months after the fracture. A total of 32 women (13.4%) received an anti-osteoporotic drug at the time of the fracture and 14 of 206 untreated women (6.8%) received an anti-osteoporotic drug at a median of 3.8 months after the fracture. Receipt of an anti-osteoporotic drug was more frequent for women with than without BMD assessment after the fracture (8/19 [40.1%] versus 6/187 [3.2%]; $P < 0.005$).
Conclusion: This work, performed in a large sample, suggests that only 10% of women 50 years of age or older in France undergo BMD assessment after a forearm fracture and that BMD assessment is associated with anti-osteoporotic drug prescription.

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1. Introduction

Osteoporosis is a highly prevalent condition characterized by bone fragility leading to fractures, most often of the forearm, vertebra and hip. An estimated 40% of women 50 years of age or older will have a bone fracture during their lifetime, 16% a forearm fracture [1]. Each year in France, nearly 40,000 forearm fractures occur [2]. The fracture is considered a warning and should lead to the diagnosis and management of osteoporosis, especially in women; bone mineral density (BMD) is reduced in women who have had such fractures [3–6]. BMD assessment is recommended and has been financially reimbursed since 2006 [7] according to national guidelines in France [8].

The occurrence of osteoporotic fracture is approximately 2 times higher with than without a forearm fracture [9]. As well, morbidity and mortality are increased after a severe osteoporotic or forearm fracture in patients older than 75 years [10,11], which represents a burden for society [12]. However, despite effective drugs, less than one third of women with peripheral osteoporotic fracture receive such treatment [13–17].

In the present study, we used health insurance data for a large sample of women 50 years of age or older in France to estimate the rate of BMD assessment and anti-osteoporotic drug prescription after forearm fracture in women.

2. Methods

2.1. Medical databases and population

In France, the Système Informationnel de l'Assurance Maladie–Extraction Recherche Analyse pour un Suivi Médico-Economique

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(SIAM-ERASME) health insurance database of the national social insurance program Caisse Primaire d'Assurance Maladie (CPAM) collects data for 2 consecutive years of reimbursed medical activity and medication. This database covers private clinic expenses for outpatients [18].

The population of the Indre-et-Loire district in midwest France is 590,515 people and the population covered by the unified health insurance program is 519,339 people. On December 31, 2012, this area was serviced by 19 rheumatologists, 602 general practitioners, 4 private hospitals and 7 public hospitals. As an example, in 2012, 3622 of the insured people had undergone at least one BMD assessment (performed in outpatient private clinics); among them were 3295 women aged 50 years and older.

2.2. Patients

We identified women aged 50 years of age or older who underwent immobilization or reduction for a forearm fracture between August 1, 2010 and June 30, 2012, via the French common classification for medical procedures [Classification Commune des Actes Médicaux (CCAM)] with the following codes: MZMP004 (making of a rigid device on the forearm or hand for initial immobilization for a fracture of the upper limb, without reduction), MZMP013 (making of an ante-brachio-palmar rigid device for initial immobilization for a fracture of the upper limb, without reduction) and MCEP001 (orthopedic reduction for a fracture or epiphyseal detachment of one or the 2 bones of the distal forearm).

Patients who underwent BMD assessment between August 1, 2010 and June 30, 2012 or received an anti-osteoporotic drug prescription (bisphosphonates, strontium ranelate, raloxifene or teriparatide) from August 1, 2010 to August 28, 2012 were identified. The BMD assessment was identified with the code PAQK007 (BMD obtained by dual-energy X-ray absorptiometry). We studied whether age, having a long-term illness and prescription of an anti-osteoporotic drug were associated with BMD assessment. Long-term illnesses are severe or chronic illnesses for which the health insurance system in France covers 100% of the medical expenses and can be used as an indirect marker of co-morbidities.

2.3. Statistical analysis

Data are presented as median (range). We used chi^2 test to assess any link between BMD assessment and prescription of anti-osteoporotic drugs and between long-term illness and BMD assessment and the cumulative frequency of BMD assessments after fracture. R 2.14.1 (http://www.r-project.org, the R Foundation for Statistical Computing, Vienna, Austria) was used for analysis.

3. Results

Between August 1, 2010 and June 30, 2012, we identified 250 forearm fractures [MCEP001: 79 women, MZMP004: 16 women, MZMP013: 156 women; one fracture coded twice (MCEP001 and MZMP013)]. The analysis involved 238 women because 12 women had already undergone BMD assessment before the fracture. The median age at the time of the fracture was 73.5 years (50–104). A total of 24 women (10.1%) had undergone BMD assessment at a median of 118.5 days (16–520) after the fracture (Fig. 1). Women with and without long-term illness did not differ in undergoing BMD (3.6% and 13.6%, P > 0.05) (Table 1).

Treatments by the presence or absence of BMD assessment are in Fig. 2. In total, 32 women were receiving anti-osteoporotic drugs at the time of the fracture. For the 206 others, only 14 (6.8%) received anti-osteoporotic drugs at a median of 114.5 days (1–256) after the fracture; 8 were among the 19 women who had undergone
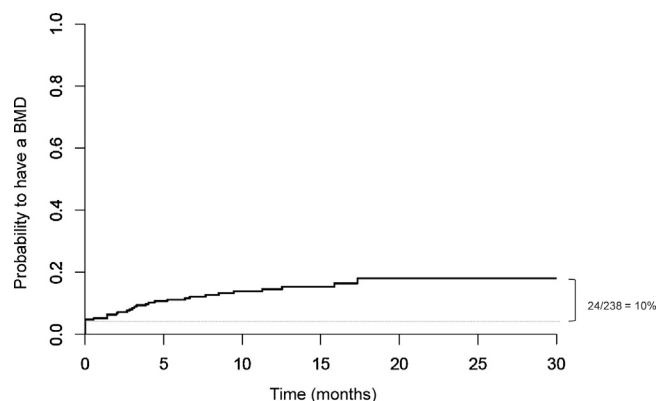

Fig. 1. Cumulative percentage of bone mineral density (BMD) assessment after forearm fracture over time in women older than 50 years of age. One third (12/36) of BMD assessments were performed before the fracture.

Table 1
Effect of having a long-term illness on undergoing bone mineral density (BMD) assessment after forearm fracture in women older than 50 years of age.

	BMD assessment		
	Yes	No	Total
Long-term illness	3 (3.6)	81 (96.4)	84
No long-term illness	21 (13.6)	133 (86.4)	154
Total	24 (10.1)	214 (89.9)	238

Data are number (percentage). Long-term illnesses are severe or chronic illnesses for which the health insurance system in France covers 100% of the medical expenses.
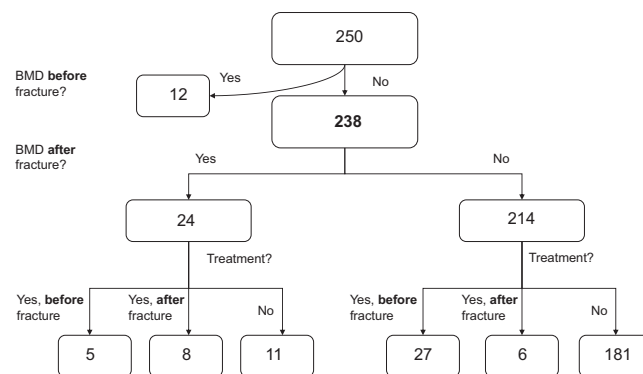

Fig. 2. Number of women older than 50 years of age receiving treatment by BMD assessment after forearm fracture.

BMD and the 6 others were among the 187 who had not undergone BMD assessment. Thus, receipt of an anti-osteoporotic drug was more frequent among women with than without BMD assessment (40.1% vs 3.2%; P < 0.005). The most commonly prescribed anti-osteoporotic treatments were bisphosphonates (Table 2).

Table 2
Type of anti-osteoporotic treatments prescribed in women older than 50 years of age after forearm fracture by BMD assessment.

Anti-osteoporotic treatments	BMD assessment		
	Yes	No	Total
Bisphosphonates	7	4	11
Selective estrogen receptor modulators	1	1	2
Strontium ranelate	0	1	1
Teriparatide	0	0	0
Total	8	6	14

Fourteen on 206 patients (6.8%) received anti-osteoporotic drugs after the fracture, 8 (40.1%) had undergone BMD and 6 (3.2%) had not undergone BMD assessment.