

FRAGILITY FRACTURES IN BRAZIL: CROSS-SECTION STUDY

FRATURAS POR FRAGILIDADE NO BRASIL: ESTUDO TRANSVERSAL

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ABSTRACT

Objective: To evaluate the involvement of orthopedists and orthopedic residents with fragility fractures, in its clinical, therapeutic, and social aspects. **Methods:** Cross-sectional observational and prospective study that took place in the period from June to August 2020. **Results:** 540 participants were analyzed. The population consisted of orthopedists (85.56%; N = 462) and residents (14.44%; N = 78), with a greater proportion of individuals from 41 to 50 years of age (36.67%; N = 198) and from the Southeast region (57.22%; N = 309). For 47.04% (N = 254) of the participants, the profile of the patient at risk for fragility fracture corresponds to: woman, sedentary, smoker and over 60 years of age. The consensus among the participants (97.96%; N = 529) is that fragility fractures occur in or near home environments. Moreover, 47.59% (N = 257) believe that the first fragility fracture is the most important predictive risk factor for subsequent occurrences and 63.89% (N = 345) of the participants claim to attend more than 15 cases per year. Regarding treatment, 74.44% (N = 402) are dedicated exclusively to orthopedic aspects (68.33%; N = 369). However, 62.41% (N = 337) of the participants believe that patients with fragility fractures should receive medication and supplements. Likewise, 70.74% (N = 382) of the participants consider that home security measures and training of family members are important, and they attribute the role to the multidisciplinary team. **Conclusions:** Fragility fractures are frequent in the routine of Brazilian orthopedists. However, they are not familiar with adjuvant treatments for fragility fractures, acting almost exclusively in the orthopedics aspects of these injuries. **Level of Evidence II, Prospective Study.**

Keywords: Femoral Fractures. Osteoporosis. Osteoporotic Fractures.

RESUMO

Objetivo: Avaliar o entendimento entre ortopedistas e residentes em ortopedia sobre as fraturas por fragilidade, em seus aspectos clínicos, terapêuticos e sociais. **Métodos:** Estudo transversal, observacional e prospectivo que ocorreu no período de junho de agosto de 2020. **Resultados:** Foram analisados 540 participantes. A população foi composta por ortopedistas (85,56%; N = 462) e residentes (14,44%; N = 78), com prevalência de idade entre 41 e 50 anos (36,67%; N=198) e oriundos da região Sudeste (57,22%; N = 309). Para 47,04% (N = 254) dos participantes o perfil do paciente em risco para fratura por fragilidade corresponde a: mulher, sedentária, tabagista e acima dos 60 anos de idade. Sendo consenso entre os participantes (97,96%; N = 529) que as fraturas por fragilidade ocorrem em ambientes domiciliares ou próximo a eles. Além disso, 47,59% (N = 257) dos participantes acreditam que a primeira fratura por fragilidade seja o fator de risco preditivo mais importante para novo episódio de fratura e 63,89% (N = 345) dos avaliadores atendem mais de 15 casos por ano. Em relação ao tratamento, 74,44% (N = 402) dedicam-se exclusivamente aos aspectos ortopédicos (68,33%; N = 369). No entanto, 62,41% (N = 337) dos participantes acreditam que paciente devam receber medicamentos e suplementos. Da mesma forma, 70,74% (N = 382) dos avaliadores consideram que medidas de segurança domiciliar e treinamento de familiares sejam importantes e atribuídas a equipe multiprofissional. **Conclusão:** As fraturas por fragilidade são frequentes na rotina dos ortopedistas brasileiros. No entanto, estes não estão familiarizados com tratamentos adjuvantes nas fraturas consideradas por fragilidade, atuando quase que exclusivamente nos aspectos ortopédicos envolvidos nestas lesões. **Nível de Evidência II, Estudo Prospectivo.**

Descritores: Fraturas do Fêmur. Osteoporose. Fraturas Osteoporóticas.

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INTRODUCTION

Osteoporosis is a disease characterized by decreased density and deterioration of the bone microarchitecture, predisposing the appearance of fractures due to the mechanical fragility established.¹ The diagnosis of this disease can be made by identifying fractures

in the spine, proximal regions of the humerus and femur, or even in the distal region of the radius, without the presence of major trauma. Injuries that occur without high-energy trauma are called “fragility fractures” and the main clinical manifestations of osteoporosis are then considered.

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The study was conducted at Department of Orthopedics and Traumatology, Paulista School of Medicine, Universidade Federal de São Paulo. Correspondence: Luiz Fernando Cocco. Rua Napoleão de Barros, 715, São Paulo, SP, Brazil, 04024002. lcocco@unifesp.br

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The introduction of effective strategies that prevent fragility fractures is extremely important, especially for older adults,² since the presence of previous fracture increases the risk of a second fracture. To avoid future sequelae, this pattern of fractures must be recognized, instead of only treating the fractures without relating them to osteoporosis. An easy and low-cost prevention method is the early diagnosis of osteoporosis using tests capable of evaluating bone mineral density, which could help the adoption of treatment.^{3,4}

If, on the one hand, prevention does not require many expenses, the treatment, however, is costly. One study by Mayo Clinic, with data from 2000 to 2011, reveals that osteoporotic fractures accounted for 4.9 million hospitalizations with an expenditure of US\$ 5.1 billion, higher than that caused by acute myocardial infarction (2.9 million and US\$ 4.3 billion), stroke (3.3 million and US\$ 3 billion) and breast cancer (700,000 and US\$ 0.5 billion).⁵

In Brazil, there are still few data and information on the occurrence of osteoporotic fractures, despite the large number of affected patients, high morbidity and mortality rates due to chronic-degenerative diseases, and the increased life expectancy, which contributes to the increase in numbers related to this public health problem; therefore, more studies on the subject are needed. Thus, this study aims to evaluate the involvement of orthopedists and residents in Orthopedics with fragility fractures, in its clinical, therapeutic, and social aspects.

MATERIALS AND METHODS

Study

Cross-sectional observational and prospective study that occurred in the period of June 2020, in the department of Orthopedics and Traumatology of the Hospital São Paulo of the Federal University of São Paulo – UNIFESP (EPM), São Paulo. The study follows the ethical and legal precepts, it was submitted and approved by the Research Ethics Committee of UNIFESP/EPM, opinion no. 31720320.5,000,5505

Inclusion criteria

The research is intended exclusively for resident physicians of Orthopedics and Traumatology enrolled in services accredited by SBOT (Brazilian Society of Orthopedics and Traumatology) and orthopedists in activity in Brazil, of both sexes, who voluntarily filled out and sent the questionnaire correctly and completely, and who are in accordance with the informed consent form.

Questionnaire application

The questionnaire on the particularities of fragility fractures was sent to the regional Orthopedics and Traumatology societies linked to SBOT, as well as to the reference medical residency services of each region of the country.

The questionnaires were developed and applied online on the Google Forms platform, being forwarded to orthopedists and to residents in Orthopedics and Traumatology, exclusively in digital form, via email; not being made available in person. The answers were presented in multiple choice format; however, with the possibility of selecting only one option per question.

The questions addressed epidemiological, diagnostic, therapeutic, and preventive conditions involving the population considered at risk for this type of disease. The waiting time for return of responses was 30 days from the email date.

Statistical analysis

The descriptive analysis of the answers was expressed as frequency and proportion. The results were tabulated and organized in spreadsheets in Excel (Chicago, USA).

RESULTS

The study population consisted of 540 participants, with no exclusions. We had a significantly higher participation of orthopedists (85.56%; N = 462) compared to residents (14.44%; N = 78), which justifies the prevalence of age between 41 and 50 years (36.67%; N = 198). Most participants (57.22%; N = 309) came from the Southeast region (Table 1).

Regarding epidemiological aspects, we observed that most participants (47.04%; N = 254) believe that the patient profile that present risk of fragility fracture include: woman, sedentary, smoker, and over 60 years of age. Participants considered fragility fractures as those that affects the hip, wrist, shoulder, or spine (53.52%; N = 289) (Table 2).

A consensus among participants (97.96%; N = 529) is that fragility fractures occur in or near home environments, revealing an important information for the implementation of public policies aimed at prevention. Additionally, 47.59% (N = 257) believe that the first fragility fracture is the most important predictive risk factor for a subsequent occurrence. Among the participants, 67.78% (N = 366) considered that the fragility fracture should be notified to the health regulatory agencies in municipal, state, or federal level, and 63.89% (N = 345) attend more than 15 cases per year.

Regarding treatment, 74.44% (N = 402) of the participants dedicate themselves exclusively to the orthopedic aspects of the case, considering only the patient and the fracture characteristics (68.33%; N = 369). For 62.41% (N = 337) of the participants, patients undergoing follow-up after fragility fractures should receive some adjuvant drug treatment (alendronates, hormones, vitamin D, calcium, among others), as a preventive measure for a next fracture. However, they refer their patients to other specialists to conduct this therapy. Similarly, 70.74% (N = 382)

Table 1. Description of the study participants.

Variable	N	%
Specialization		
Orthopedist	462	85.56
Resident in Orthopedics	78	14.44
Age		
from 20 to 30 years	88	16.30
from 31 to 40 years	159	29.44
from 41 to 50 years	198	36.67
over 51 years	95	17.59
Region		
North	42	7.78
Midwest	57	10.56
Northeast	61	11.30
South	71	13.15
Southeast	309	57.22
Specialty		
Spine	10	1.85
Pediatric Orthopedics	10	1.85
External Fixator	12	2.22
Tumor	13	2.41
Foot/ankle	27	5.00
Hand	34	6.30
Hip	52	9.63
Knee	63	11.67
Shoulder and Elbow	76	14.07
Orthopedic trauma	104	19.26
No subspecialty	139	25.74
Total	540	100.00

Table 2. Epidemiological and clinical aspects of fragility fractures in the view of Brazilian orthopedists.

Survey	N	%
You consider that the patient at risk of presenting Fragility Fracture is:		
I don't believe there's a characteristic profile of a patient at risk	13	2.41
woman, obese, sedentary, after menopause	118	21.85
men or women over 60 years of age have similar risks of having fragility fractures	155	28.70
woman, smoker, over 60 years, and sedentary	254	47.04
You consider Fragility Fractures as those that:		
affect patients over 60 years of age	13	2.41
affect patients over 60 years of age with diagnosis of osteoporosis	104	19.26
result exclusively from low-energy traumas	134	24.81
affect hip, wrist, shoulder, or spine in patients over 60 years of age	289	53.52
You consider Fragility Fractures to occur:		
in car accident		
in sports environment	1	0.19
resulting from metastatic fractures	10	1.85
usually in a home environment or near patients' homes	529	97.96
You consider that the main risk for Fragility Fracture is:		
consolidation difficulties due to compromised bone quality	17	3.15
the high costs and prolonged time of hospital admissions	21	3.89
general clinical complications and risk of death	245	45.37
New fractures due to fragility	257	47.59
Do you consider that Fragility Fractures should be of mandatory notification?*		
No	174	32.22
Yes	366	67.78
Total	540	100.00

*For municipal, state, or federal public health control agencies.

of the participants consider that home security measures and family training are important, but attributed it to the multidisciplinary team of physiotherapists, nurses, and social workers (Table 3).

DISCUSSION

Despite the epidemiological and economic relevance of fragility fractures, there is still no standardized clinical approach to the treatment of this disease.^{1,6} Thus, our study evaluated the involvement of orthopedists and of residents in Orthopedics with fragility fractures in its clinical, therapeutic, and social aspects. This information, besides being relevant to the care of the population, serves as a basis for public health policies involving this disease.

More than half of the answers came from professionals of the Southeast region (57.22%; N = 309), something expected if we consider that most of the country's medical education and training services are concentrated in this region. Moreover, Southeast region is responsible for the largest investments (53.4% in 2008, 52.4% in 2009, and 48.5% in 2010)⁵ and number of procedures (43.2% in 2008, 44.3% in 2009, and 48.3% in 2010) when compared with the other regions of the country.²

According to the orthopedists interviewed, the profile of the patient at risk for a fragility fracture corresponds to: woman, sedentary, smoker, and over 60 years of age. The results corroborate Brazilian publications that reported a higher prevalence of frailty in sedentary women over 60 years of age.⁷

Table 3. Treatment of fragility fractures in the view of Brazilian orthopedists.

Survey	N	%
How many Fragility Fractures do you treat each year?		
Less than 5	47	8.70
between 5 and 10	71	13.15
between 10 and 15	77	14.26
More than 15	345	63.89
You treat Fragility Fractures:		
by being responsible for clinical/geriatric and orthopedic aspects by choice	41	7.59
by being responsible for clinical/geriatric and orthopedic aspects due to lack of multidisciplinary team	91	16.85
in a multidisciplinary manner, dedicating myself exclusively to orthopedic aspects	402	74.44
Your orthopedic conducts in the treatment of Fragility Fractures are usually:		
preferably non-surgical due to the multiple clinical comorbidities generally present	64	11.85
preferably surgical, with bone fragility being one of the main reasons	107	19.81
similar to other fractures, considering only the patient and the characteristics of the fracture	369	68.33
Do you believe that complementary treatments should be instituted in Fragility Fractures?*		
No, since I'm not familiar with these medications.	10	1.85
No, since there is no evidence in the literature to justify its inclusions	15	2.78
Yes, and I do the prescriptions of these medications for my patients	178	32.96
Yes, but I refer my patients to other doctors for these treatments	337	62.41
Do you consider that the recommendations for patients who are victims of Fragility Fractures are:#		
inefficient in preventing new fractures	2	0.37
important, they are carried out by me due to lack of a multidisciplinary team involved	156	28.89
important, they are performed by a multidisciplinary team (physiotherapists, nurses, social workers)	382	70.74
Total	540	100.00

*Treatments with alendronates, bisphosphonates, hormones, vitamin D, calcium, among other therapies; #related to home safety, prevention of new falls, and training of close family members.

Among the interviewees, 63.89% (N = 345) of the participants treated more than 15 patients with a diagnosis of fragility fracture per year. These numbers are relevant and in agreement with estimates that indicate a national projection of 10 million individuals affected by osteoporosis, with a prevalence of 11 to 23.8% for all types of bone fragility fracture.⁸

Nevertheless, fragility fractures are not officially considered for notification to public health agencies. However, 67.78% (N = 366) of the participants agree that this increase in the list of diseases of compulsory notification would help public policies become more efficient in the prevention and treatment of fragility fractures. Similarly, 47.59% (N = 257) of the interviewees considered that the first fragility fracture is the most important predictive factor for a new fracture. This response corroborates the literature data that shows that the existence of a previous history of fragility fracture is an indicator for the occurrence of future fractures.^{3,4,9} Another relevant result was that 74.44% (N = 402) of the participants dedicate themselves exclusively to orthopedic aspects (basically surgical procedures) in cases of osteoporotic fractures – 62.41% (N = 337) refer patients to other specialists to treat osteoporosis and secondary prophylaxis (use of medications, hormones, and vitamins). Evidence shows that the administration of drugs, such as alendronate and etidronate, can prevent fragility fractures.^{10,11}

Moreover, 70.74% (N = 382) of the interviewees transfer to the multidisciplinary team (physiotherapists, nurses, and social workers) the role of guiding patients, victims of fragility fractures, on home safety, prevention of new falls, and training of family members. Since most osteoporotic fractures occur by fall, the reduction of this event is extremely important to prevent a secondary fracture. Thus, the rehabilitation of patients with fragility fractures should be performed by a multidisciplinary team.¹²

The costs of treating fragility fractures are high; higher than other diseases, such as acute myocardial infarction.⁵ In cases in which the fragility fracture has already been diagnosed and treated, establishing secondary prophylaxis could decrease 30 to 60% of the recurrence of this type of lesion.⁴

The multidisciplinary management of patients with osteoporosis is a reality in large centers, with increasingly better preventive and therapeutic results. The increase in life expectancy will make this

condition increasingly present in clinical practice and in the training of orthopedists, making evident the need of public health policies aimed at the patients at risk.

CONCLUSION

Patients with fragility fractures are frequent in the daily practice of most Brazilian orthopedists. Orthopedists and residents in Orthopedics and Traumatology are not familiar with adjuvant treatments for fragility fractures, acting almost exclusively on the orthopedic aspects of these lesions.

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