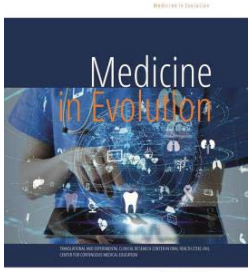
The impact of the presence of risk factors for fragility fractures in people with osteoporosis



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Abstract

Osteoporosis is an important clinical problem due to the increased bone fragility that predisposes to fractures. The objective of this study was to analyse the implication of risks factors for fragility fractures in people with osteoporosis and the differences between people with osteoporosis without fragility fractures and those with fragility fractures. MATERIAL AND METHODS: We conducted a retrospective study of people diagnosed with osteoporosis. Two groups were formed: one that included people diagnosed with osteoporosis who had fragility fractures that required surgery and one that included people diagnosed with osteoporosis who did not have fractures at the time of inclusion. We compare the two groups in order to differentiate the significance of risk factors for fractures associated osteoporosis. RESULTS: The gender distribution of the two groups highlights the predominance of females, and the average age was 79.8 years with a tendency to distribute osteoporosis to old age; all women in both groups were menopausal; the sedentary lifestyle and reduced physical activity were seen in both groups; 77% of those included in the study showed functional impotence; frequent falls, which predispose to fragility fractures, is noted in the case group at 41 of the 59 included in the study compared to 8 in the control group; the presence of hypertension was noted in 43 people in the case group and 40 in the control group, respectively, while the presence of diabetes and stroke have no statistical significance in this study. CONCLUSIONS: Women and old age are prone to osteoporosis. The presence of menopause and a sedentary lifestyle predispose to functional impotence. In terms of risk factors, falls prevention, screening for hypertension requires careful management of medication that influences bone mineral density.

Keywords: osteoporosis, age, obesity, previous fracture

INTRODUCTION

Osteoporosis, for older men and women, is a major clinical problem. Almost any bone can fracture due to the increased bone fragility of osteoporosis. These are associated with much higher health care costs, physical and mental disability, impaired quality of life, and increased mortality [1,2]. Owing to the incidence of osteoporotic fracture is increase with age, measures to diagnose and prevent osteoporosis and its complications are a significant public health concern [3]. Many other modifiable and non-modifiable risk factors for osteoporosis have also been identified [4]. The treatment of potentially modifiable risk factors and exercise and supplementation with calcium and vitamin D form an essential adjunct to the pharmacological management of osteoporosis. Improved household safety can reduce the risk of falling [5]. Hip protectors are effective in the nursing home population [6,7]. Bone mineral density (BMD) measurement is used to diagnose osteoporosis before an incident fracture and predict fracture risk [8]. Recommendations for treating and preventing osteoporosis are presented based on the bone mineral density score published by the World Health Organization and the National Osteoporosis Foundation [9].

The incidence of hip fractures accelerates at about ten years after menopause in women and after 70 in men. About one million Americans suffer from fragility fractures each year at the cost of more than $ 14 billion [10]. Disability, mortality, and the cost of hip and vertebral fractures are substantial in the rapid population growth, so the prevention of osteoporosis is a significant public health problem [11].

All women aged 65 years or older should be screened for osteoporosis by measuring BMD in the hip and lumbar spine using dual X-ray absorption (DXA) [12].

This recommendation is universally endorsed by the US Preventive Services Task Force (USPSTF) and other professional societies. Although the prevalence of osteoporosis in this patient population is almost 25%, recent data suggest that 1 in 4 women aged 65 to 85 have never had BMD tests. The risk assessment strategy for selecting postmenopausal young women for osteoporosis screening is uncertain [13,14].

Despite the rapid rate of bone loss in the lumbar spine during the menopausal transition, the absolute risk of fracture for a particular BMD is much lower in young postmenopausal women than in older women. In particular, the absolute probability of 5 years of hip fracture is less than 1% until the age of 70-79, when it begins to increase exponentially. Data on the benefits and harms of drug treatment starting at the age of 50-64 and continuing for the next three decades of life are not available [15]. The use of drug treatment in younger women leaves them with fewer pharmacotherapy options at age 70, when the risk of hip fracture begins to increase. However, there is no consensus on all the specific risk factors that should be considered in this decision [2].

Aim and objectives

The objective of this study was to analyze the implication of risks factors for fragility fractures in people with osteoporosis and the differences between people with osteoporosis without fragility fractures and those with fragility fractures.

MATERIAL AND METHODS

We conducted a retrospective observational study between 2020 to 2021 of people diagnosed with osteoporosis. All patients signed written consent at hospital admission for participation in studies research. These data are used for an MD thesis, and local ethical approval was obtained.

This study aimed to determine unmodifiable and modifiable risk factors for fracture in people with osteoporosis. Two groups were formed: one that included people diagnosed with osteoporosis who had fragility fractures that required surgery and one that included people diagnosed with osteoporosis who did not have fragility fractures at the time of inclusion. We want to study if there were differences between the two groups regarding risk factors for fractures as age, weight, physical activity, heredocolateral osteoporosis.

The inclusion criteria were represented by a definite diagnosis of osteoporosis and age over 18 years. The exclusion criteria were age under 18, the uncertainty of the diagnosis of osteoporosis, the presence of other osteoarticular diseases that could cause fractures or functional impotence.

The descriptive data and outcomes for this study were collected from the electronic database, and the observation sheets within the Bucharest University Emergency Hospital and the electronic database and the patient files from the family medicine office. The data were statistically processed using Excel programs. The statistical processing did not allow the identification of any person included in the study, respecting the confidentiality of personal data.

RESULTS

We analyzed 118 persons, men and women. we found more than 80 % of fragility fractures in the hip in women, in the right femoral col, followed by fractures in the left distal radius.

The gender distribution of the two groups reveals the predominant presence of females in both groups, namely 76% (case group) and 71% (control group), compared to males with a presence of only 24% (case group) and 29% (lot witness).

In terms of age, it was between 61 and 97 years in the case group, and the average age was 79.8 years +/- 9.14 standard deviation (ds). the control group was between 57 years and 91 years, with an average age of 79.1 years +/- 8.95 ds. comparing the two groups from the perspective of age groups, older ages in the case group are highlighted (Figure 1).

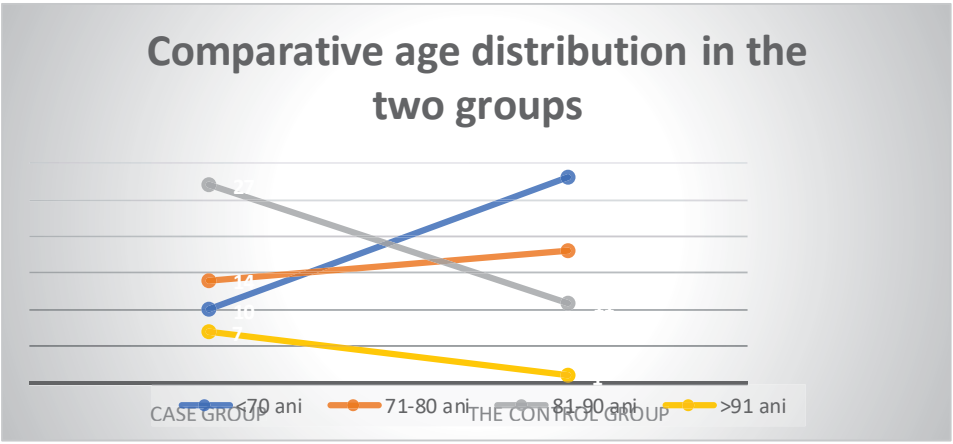
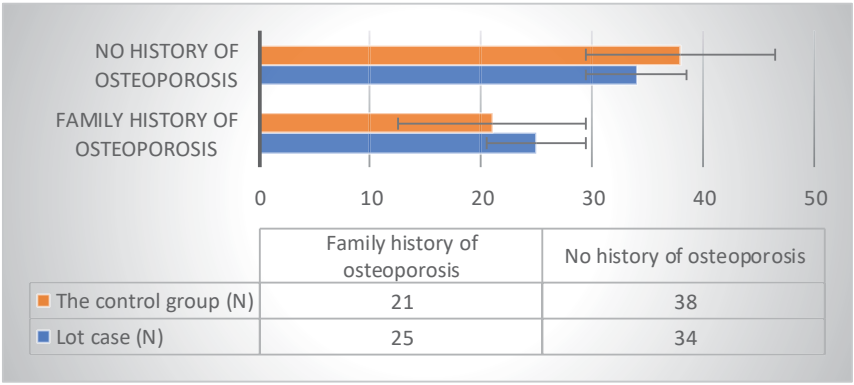


Figure 1. Comparative age distribution in the two groups

Heredocolateral history of osteoporosis reveals the presence of osteoporosis in 21 people in the control group and 25 people in the case group (Figure 2).



	Family history of osteoporosis	No history of osteoporosis
The control group (N)	21	38
Lot case (N)	25	34

Figure 2. Hereditary collateral history of osteoporosis in both groups

Among the risk factors, smoking was present in only 8% of the people included in the case group; instead, 61% of smokers were in the control group. Alcohol consumption, another risk factor, is present in only 4 of the 59 included in the case group and 8 of the 59 included in the control group. The weight distribution by groups is shown in Figures 3 A and B.

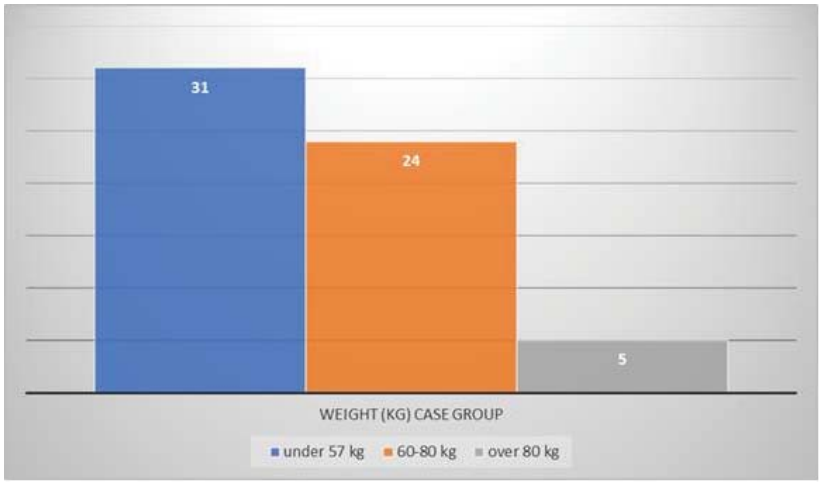


Figure 3A. Distribution by groups according to weight - case group

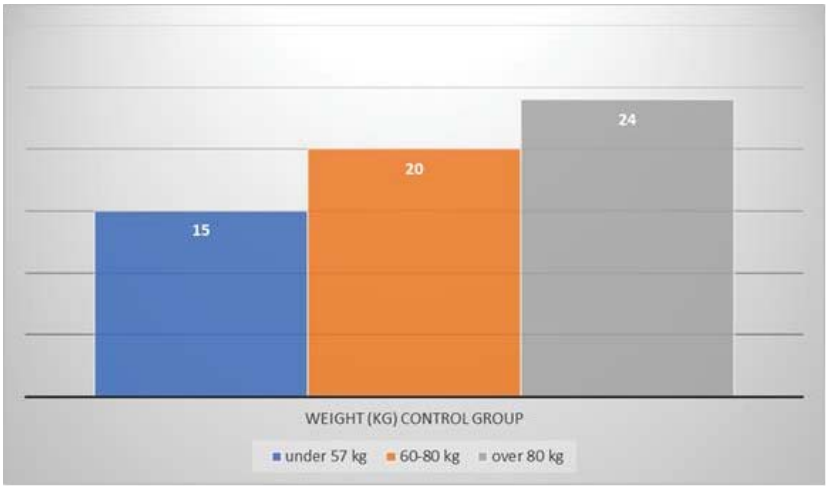


Figure 3B. Distribution by age groups by weight - control group

The lowest body mass index in the case group was 17.6, and the highest of 32.14.

Physical activity in the case group reveals the predominance of a sedentary lifestyle and reduced physical activity. No study participants showed intense physical activity. Physical activity in the control group reveals the presence of reduced physical activity in most patients, 42 out of a total of 59. Intense physical activity is missing. Osteoporosis can be observed in the case group in the heredocolateral antecedents in 70% of people (n=25), and 19 of the 25 people were female. Osteoporosis in the control group is relevant in 66% of study participants.

The presence of menopause in all women included in the study in both groups is noticeable.

Of the total number of people included in the study, all in the case group had functional impotence and only 18 in the control group. A total of 77% showed functional impotence, compared to 23% without functional impotence.

Analysing each comorbidity of patients with osteoporosis, we note the presence of hypertension in 43 people in the case group and 40 in the control group. Diabetes was highlighted as a comorbidity in 8 people in the case group and 12 in the control group. The stroke was highlighted as a personal pathological antecedent in 4 people in the case group and six people in the control group. Regarding obesity as a risk factor, it was found in only 3% of the case group, respectively, in 7% of those who make up the control group.

There is an increased frequency of frequent falls in the case group compared to the control group, where only 9% had frequent falls in the background.

The presence of previous fractures is higher in the case group than in the control group, where only two people had a history of fractures (Figure 4).

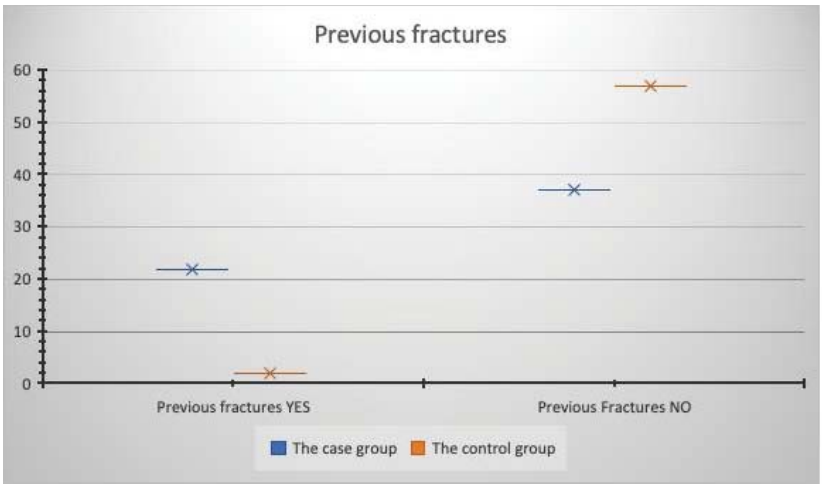


Figure 4. Previous fractures for case group and control group

Medication that may influence bone mineral density or the risk of falling used in the case group and the control group are shown in Figures 5 A and B.

Figure 5. A. Medication - case group (A)

Figure 5. B. Case-control group (B)

From our data it can be seen that femoral neck and PTH fractures predominate, especially among women.

DISCUSSIONS

Our study demonstrates differences between risk factors for fragility predisposing. Osteoporosis remains a common disease among the elderly and is a significant public health problem worldwide. After the age of 30, the reduction of bone mass is an inevitable process, and, consequently, changes in the bone remodelling cycle will lead to bone fragility and an increased risk of bone fractures [16]. A fracture is considered osteoporotic (fragility fracture) if it is caused by relatively low trauma, such as a fall from orthostatism, caused by a force that would not be expected to cause a fracture in a healthy adult. Frequent falls predisposed to fragility fractures are noted in the case group in 41 of the 59 included in the study, while only 9% of the control group had frequent falls. Another factor that predisposes to fragility fractures is previous fractures. These being present in 22 of those included in the case group compared to only 2 in the control group.

Numerous factors that can be classified into the group of risk factors that cannot be influenced (unchangeable factors) and risk factors that can be modified (variable or preventable factors) are involved in osteoporosis [17,18].

As the population ages increases, the incidence of osteoporosis and resulting fragile osteoporotic fractures is increasing. Our study confirms the presence of older ages in the case group. Over 57% of patients with fragility fractures were over 80 years old.

The presence of a family history of osteoporosis does not reveal statistically significant differences between the two groups. Both groups have a high percentage of osteoporosis in the family, clearly a predisposing factor for the development of osteoporosis.

While osteoporosis is diagnosed more frequently in women than men, its incidence in men is also increasing [19]. The present study also reveals the predominance of females in both groups (over 70%). Osteoporosis is rarely diagnosed in premenopausal women. However, the prevalence increases with age due to progressive bone loss. In the United States, it has been estimated that up to 54% (16.8 million) postmenopausal women have low bone mass (t-score of -2.0), and another 20% to 30% (6.9 million) have osteoporosis [20]. In the United States, osteoporosis increases from 15% at age 50 to 70% at age 59 in women aged 80 years. Epidemiological studies in other countries have reported similar findings [21,22]. In the present study, all women in both groups were menopausal.

CONCLUSIONS

The clinical and economic consequences of osteoporosis indicate the need for intervention in high-risk elderly people. A multitude of risk factors can have a significant impact on bone mineral density in the elderly. These factors should be considered in the risk management of fracture to determine if the patient needs further evaluation and/or treatment. Women and old age are prone to osteoporosis. The presence of menopause and a sedentary lifestyle predispose to functional impotence. In terms of risk factors, proper management is required, frequent preventive falls, screening for hypertension also requires careful management of medication that influences bone mineral density.

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