ORIGINAL ARTICLE

RISK FACTORS OF VERTEBRAL FRACTURES AMONG WOMEN AGED MORE THAN 50 ATTENDING TERTIARY CARE CENTRE: A CASE CONTROL STUDY

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ABSTRACT

Background: Vertebral Fractures are most frequent type of fracture in osteoporosis and often it remains asymptomatic or happens unnoticed and is not diagnosed. Objective: The present case control study was planned to find out the risk factors for undiagnosed vertebral fractures in a population of women over 50 years attending tertiary care centre for the complaint of chronic back pain.

Material and methods: There were 180 participants in the case group who had chronic back pain and 60 participants in the control group who didn't. All the details of risk factors, demographic information, clinical symptoms, X-ray findings were collected in the predesigned questionnaire.

Results: The height of the women with chronic back pain were shorter than those who did not have back pain (p= 0.005), they had a greater proportion of kyphosis (58%) and a higher proportion of VF (17%). The association between chronic back pain and BMI, VFs and kyphosis was statistically significant.

Conclusions: At the time of the study 17% of women with chronic back pain presented with at least one VF. They also had a higher prevalence of kyphosis than the women without back pain. A regular screening should be done in women aged more than 50 with chronic back pain so that VFs can be identified and treated timely.

Key words: Vertebral fracture, Women, Osteoporosis, chronic Back pain

INTRODUCTION

Osteoporosis is a very common disease which predominantly affects older women, although it can affect both sexes[1,2]. It is estimated that from the age of 50 white women have a risk of osteoporotic fracture of almost 50% for the rest of their lives[3]. Fractures are a clinical complication of osteoporosis[4] and among them vertebral fractures (VF) are notable for their frequency, while notable for their seriousness are fractures of the proximal extremity of the femur – or fracture of the hip[3,5].

VFs, being the osteoporotic fracture most prevalent, often occur unnoticed and are not diagnosed. This is because on the one hand diagnosis requires a lateral X-ray of the spinal column, with the application of criteria for vertebral deformity which often don't coincide[6,7], while on other hand VFs can be asymptomatic[8]. In addition, back pain, which can be a symptom of VF, is often attributed to other diseases, or even to age.

Because of this we have carried out this study in a population of women who attended an Internal Medicine clinic suffering from chronic back pain, with the objective of studying in these patients the prevalence of undiagnosed VF.

MATERIAL AND METHODS

The present study was designed as a case control study in which the cases were post-menopausal women over 50 years who attended outpatient clinic, presenting with chronic back pain. The following criteria for including patients in the study were used: a) having back pain, located in the dorsal and/or lumbar spinal column; b) that the pain was present for at least 3 months and; c) that there was no already-known cause for the pain. Back pain located in the dorsal and lumbar spinal column was included, while pain in the cervical spinal column was excluded. The control group was made up of women of the same age with no back pain, friends, but without family connections, invited by the patients themselves, not having had dorsal or lumbar back pain for at least 6 months before the consultation, and not having taken any treatment for this condition during the same period of time. The patients were informed of the objectives of the study and their consent requested. A pretested semi-structured questionnaire was utilized for collection of data. A basic physical examination was also conducted, including measurement of height and weight in light clothing. Lastly, a lateral thoracic-lumbar X-ray

was carried out on the subjects. All the X-rays were brought together and studied by two radiologists. For the diagnosis of VF the Genant criteria[12], were used. The data collected were entered into the MS excel software and odds ratio with 95% confidence interval were deduced.

RESULTS

A total of 240 post-menopausal women, 180 cases and 60 controls participated in the study. In Table 1 the basal characteristics of the population studied are shown. The average age of the participants was in the region of 70 years (69.7 ± 11.0 years in the cases and 71.3 ± 11.3 years in the controls) with no statistically significant difference between the two groups. Neither there was any difference in the weight (66.3 ± 14.0 Kg as opposed to 65.5 ± 12.6 Kg, p= 0.6) nor in the body mass index (28.0 ± 5.5 Kg/m2 as opposed to 26.7 ± 4.8 Kg/m2, p= 0.08). The women who had back pain were shorter in height than the controls (154 ± 7.7 cm as opposed to 157 ± 7.7 cm, p= 0.005).

Table 1: Basal characteristics of the population studied

	Back Pain		P value
	Present	Absent	
Age (years)	69.7 ± 11.0	71.3 ± 11.3	0.30
Weight (kg)	66.3 ± 14.0	65.5 ± 12.6	0.69
Height (cm)	154 ± 7.7	157 ± 7.7	0.005
BMI (kg/m2)	28.0 ± 5.5	26.7 ± 4.8	0.08

Table 2: Prevalence of concomitant diseases in the groups of the study

Other health ailments	Cases (%)	Controls (%)	p- Value
Number	180 (100)	60 (100)	
Diabetes	33 (18.3)	15 (25.0)	0.18
Obesity	58 (32.3)	14 (22.9)	0.14
Chronic renal failure	18 (9.9)	3 (5.0)	0.34
Tobacco	12 (6.4)	6 (10.0)	0.57
Alcohol	5 (3.0)	3 (5.0)	0.60
Dyslipidemia	69 (38.4)	27 (45.0)	0.85
Family history of osteoporotic fractures	40 (22.0)	16 (26.6)	0.80
Kyphosis	97 (54.0)	22 (36.6)	0.002

Table 3: Prevalence of fractures by group studied

	Cases (%)	Controls (%)	P - Value
Presence of any fracture	90 (50.0)	24 (39.4)	0.45
Vertebral fracture	31 (17)	2 (3.5)	0.004
Hip fracture	14 (7.9)	9 (15.5)	0.06
Colles fracture	18 (10.0)	9 (14.1)	0.33
Other fractures	32 (15.8)	10 (16.9)	0.84

Table 2 shows the prevalence of other concomitant diseases and lifestyle determinants in both groups in the study. it was found that more than half (58%) of those women who have back pain also have kyphosis, a sign which is seen in less than a third of the women who do not have back pain (36%), p= 0.002. The distribution of the other diseases - diabetes, chronic renal failure, obesity and dyslipidemia – as well as some lifestyle and risk factors – alcohol consumption and family history of osteoporotic fractures – were similar in both groups. In Table 3 we observe the distribution of fractures in both groups. It was found that 17% of post-menopausal women with back pain have, at least one VF, whilst in the control group we see that the prevalence is 3.5%, p= 0.004. The distribution of other fractures was similar in both groups: all fractures, Colles fracture, hip fracture and other fractures.

Table 4: Multidimensional logistic analysis: factors having an independent association with back pain

Factor	P -Value	*Odd Ratio* (CI – 95%)
BMI (Por Kg/m2)	0.03	1.066 (1.005 ; 1.130)
Vertebral fractures	0.01	6.325 (1.450 ; 27.6)
Kyphosis	0.008	2.246 (1.237 ; 4.077)

Finally, a multidimensional logistic analysis was carried out to discover which factors show an independent association with back pain. The results of this analysis, set out in Table 4, show these factors as being the body mass index, the existence of VFs and Kyphosis, with VFs being the variable which shows the strongest independent association (OR 6.325, CI: 1.450; 27.6, p= 0.014).

DISCUSSION

Fractures due to fragility constitute the principal clinical complication of osteoporosis, and among these VF has a special importance. A broad epidemiological study carried out in Europe demonstrated that between 20% and 25% of the population over 50 of both sexes have a VF[13], which often occurs unnoticed, since it is the only fracture in which there is neither a line of fracture nor a break in continuity between the extremes. VF can consist of a deformity, or crushing, of its morphology, requiring for its correct diagnosis, in addition to a lateral thoracic-dorsal X-ray, the application of what are known as criteria of vertebral deformity[6], of which there are many, few of which coincide[7,12]. This was observed in EVOS study, which found almost double the prevalence of VF whether they applied the deformity criteria of Eastell or McCloskey[13]. Another factor which leads to VFs being underestimated is the fact that they are sometimes asymptomatic, or are experienced as short term back pain[4,14].

VF is in itself a risk factor in suffering a new fracture, be it vertebral or hip[15,16]. A study has been published which states that 20% of women with VF without treatment suffer a new VF within a year[17], without forgetting that VF, as with the remaining osteoporotic fractures, carries a higher morbidity[5] and leads to an increase in mortality[18,19].

The present study was carried out with a population of patients who attended an Internal Medicine outpatient clinic because of back pain, or in whom this was confirmed when their clinical history was taken, this not having been the explicit reason for their attendance at the clinic. Our aim was to make a first attempt at understanding the prevalence of VF in these ambulatory patients, a study motivated by the results we obtained from other work carried out by the working group on osteoporosis of SEMI, in which we found a higher prevalence of VF, 62.6%, in those patients who were admitted and treated for a hip fracture[11]. Although in this population of high risk for osteoporosis this result was no surprise, it was surprising that in the control group in this study, who were chosen from among patients admitted to the wards for other processes unrelated to OP and without apparent high risk of osteoporosis, showed a prevalence of VF of 50%. In the current study 17% of postmenopausal women with back pain have at least one VF, whilst in the control group this prevalence was only 3.5%. Previously, another co-operative European study confirmed that up to 25% of postmenopausal women have at least one VF[12], however, the same study clearly stated that many of these fractures were asymptomatic. However, all the patients in our study should be considered as having symptomatic fractures since they attended precisely for back pain. We do not know the reasons why the prevalence of vertebral fractures in the control group was so low.

We did not find statistically significant differences in the distribution of other diseases such as diabetes, obesity, chronic renal failure and dyslipidemia, or in the distribution of some lifestyle and risk factors such as tobacco and alcohol consumption, or family history of osteoporotic fractures. As was expected, women with VF had a higher prevalence of kyphosis than the controls. On the other hand we did not find any statistically significant differences in other fragility-related fractures, neither in general nor independently in hip fractures, Colles fractures or other fractures, including fractures of humerus, tibia and ribs. By carrying out a multi-dimensional logistic analysis we found an independent association between back pain and the variables BMI, VF and kyphosis. We interpreted these results as being interrelated. We believe that the higher the BMI, the greater back pain is observed in patients who already have at least one VF, which in turn influences the development of kyphosis.

CONCLUSION

VF is found in 17.0% of postmenopausal women who have back pain, as well as a higher prevalence of kyphosis. Given that up to 20% of women who have a VF and have not had treatment suffer a new VF within one year[16], it is advisable to take into account this fact with a view to indicating the most appropriate therapeutic measures at the time.

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