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Prevalence and Related Risk Factors of Osteoporosis in the Postmenopausal Urban Indian Women

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Abstract

Introduction: Osteoporosis is a huge problem in a developing country like India, it is a challenge to the present health resources and health facility. All over the world osteoporosis affects predominately the older population and more so the postmenopausal women. world health organization (WHO) defines up to 70% of women over the age of 80 to have osteoporosis. An algorithm is developed by WHO to estimate the 10-year fracture risk, which is to be used in the absence of bone mineral density. Malnutrition, smoking and alcoholism has a negative effect on the bone mineral density. The study was performed to evaluate the prevalence of osteoporosis in the urban postmenopausal women, the associated risk factors and the correlation of the disorder to the socioeconomic status. *Material and Methods:* Patientspersonal data like obstetrics, medical, menstrual, drug history, diet history and daily exposure to sunlight was collected in a performer which was designed for the study. Patients measurements like height, weight, BMI were recorded. BMD was recorded by performing dual-energy X-ray absorptiometry scan of the calceneum .Women were classified according to the WHO criteria. *Results:* The prevalence of the condition in the postmenopausal women was 21%. The mean age of the women was 50.6+/-5.6 years. Women with more than 3 children were associated with higher risk of osteoporosis. we found no significant associated with other medical conditions like diabetes and thyroid disorder. Lack of calcium intake and regular exercise was significantly associated with low BMI. *Conclusion:* Osteoporosis is a rapidly evolving condition, our study brings out the need of a large community based study, the study of risk factors, so appropriate early measurements can be taken to interrupt the progression of the disease.

Keywords: Bone Mineral Density; Dual-Energy X-ray Absorptiometry Scan; Osteoporosis; Osteopenia and Menopause.

Introduction

Osteoporosis is a condition which makes the bone thin and fragile and thus increases the risk of fractures. this condition is more commonly see in the elderly women and increases the morbidity in the form of prolonged bed ridden [1]. Johnell et al. reported 9 million osteoporotic fractures in the year 2000 and the prevalence in south east Asia to be 15.3% [2]. Indian subcontinent is situated between 8.4° and 37.6°N latitude and majority of the population experience perennial sunlight all through the year and vitamin D through this adequate sun exposure. 1 in every 8 males and 1 in every 3 women, majority of them being elderly and postmenopausal in India suffer from osteoporosis, make our country largely affected [3]. Based in the censor 2001 it is estimated that 163 million Indian population has a low BMI above the age of 50 years, which was expected to

increase up to 230 million in the year 2015 (14). Pathology in osteoporosis is due to activation of the osteoclast, which enhances bone resorption, in the postmenopausal women the bone loss is rapid, and since there is no effective way to rebuilt the osteoporotic skeleton, the best strategy would be to minimize the bone loss in the postmenopausal women and maximize bone mass during its growth in childhood and adulthood. Therefor the knowledge about the appropriate timing for the peak bone mass is a must to postulate the perfect strategyto prevent this condition [4,5].

Urban populations have a higher number of risk factors in several studies in the west [6], which was also the same result obtained by a study conducted in four Asian countries [7]. Various studies conducted in the south east Asian countries showed no significant association to the urbanization [8,9].

In our country studies conducted prove urban low income population are more prone to develop osteoporosis [10].

Measurement of the BMD is the primary predictor of osteoporosis in the elderly population, but due to limited resources in developing countries is not feasible [11,12,13]. Dual energy X- ray absorptiometry (DXA), an advanced bone densitometer is the present day 'gold' standard for measuring BMD, but in our country only multi-specialty private set up have this facility.

Many associated factors are present with osteoporosis, like age, medical conditions like diabetes, thyroid disorder, duration of exposure to sunlight, intake of calcium. This study was conducted to estimate the prevalence of osteoporosis in the urban postmenopausal women, the risk factors and associated medical condition and intern bring about awareness, provide health education, prevention in early stage and provide treatment in affected patients.

Material and Method

This study was conducted in malleshwaram, Bangalore by dividing the area into various wards, over a period of 6 months from November 2016 to April 2017. Women who have attained menopause i.e not having regular cycles for 1 year were include in the study. The Quaester regarding their personated data of the patients were filled up by the individual, there Anthropometry was measured and tabulated. The BMI was measured by using DEXA of the calceneum. T – score as defined by the World health organization was used to category the women as normal = +1 and -1, osteopenia = -1 to -2.5 and osteoporosis = <-2.5. The collected data was tabulated and analyzed by using SPS software 10.

Results

Total of 800 postmenopausal women were screened, of whom 168 (21%) of them had the estimated T score <-2.5, 340(42.5%) women had T sore ranging from -1 to -2.5 and 292 (36.5%) women had normal bone mineral density. 86% of the population had there parity varying from 1 to 3, and 70% of who had 2 healthy children, Women with higher parity (>3) had higher occurrence of osteopenia and osteoporosis. Results reflected that 51% of study participants had a normal BMD, while a higher BMI of >25 was noted in 21% and 13% were osteopenia and osteoporotic respectively. 98.25% of the women were married females and 20% of married females were osteoporotic. Duration of menopause and association with osteoporosis among <1 year, 1 to 5 years and >5 years was 3.63%, 9.51% and 7.88% respectively. Life style modality was strongly associated with occurrence of osteoporosis, 7.25% of women with osteoporosis had a sedentary life style.

Table 1: Patient Characteristic

Variables	Bone Mineral Density(BMD)		
	Normal (%)	Osteopenia (%)	Osteoporosis (%)
Age (years)	164(20.5%)	39(4.5%)	26(3.25%)
<45	54(6.75%)	45(5.6%)	44(5.5%)
45-49	38(4.7%)	199(24.8%)	43(5.3%)
50-54	23(2.8%)	44(5.5%)	28(3.5%)
55-59	13(1.6%)	13(1.6%)	27(3.3%)
>/=60			
Parity	2(0.25%)	7(0.87%)	5(0.62%)
0	270(33.75%)	296(37%)	123(15.3%)
1-3	20(2.5%)	37(4.62%)	40(5%)
>3			
Education	168(21%)	211(26.3%)	54(6.75%)
Literate	124(15.5%)	129(16.1%)	114(14.25%)

illiterate			
BMI	165(20.62%)	176(22%)	66(8.25%)
<25	127(15.8%)	164(20.5%)	102(12.75%)
>25			
Post Menopause Duration			
<1 year	158(19.75%)	40(5%)	29(3.62%)
1-5 years	112(14%)	56(7%)	76(9.5%)
>5 years	22(2.75%)	244(30.5%)	63(7.8%)
Type of Activity	23(2.87%)	165(20.62%)	56(7%)
Sedentary	175(21.8%)	132(16.5%)	54(6.75%)
Moderate	142(17.75%)	43(5.37%)	58(7.25%)
Hard			
Addiction	-	-	-
Smoking	-	8(1%)	32(4%)
Tobacco chewing	-	-	-
Alcohol			

Table 2: Associated medical condition

Variables	Bone Mineral Density(BMD)		
	Normal (%)	Osteopenia (%)	Osteoporosis (%)
Diabetes	7(0.8%)	19(2.3%)	34(4.25%)
Hypothyroid	3(0.37%)	11(1.37%)	19(2.37%)
Hyperthyroid	0	0	4(0.5%)
Obesity	45(5.62%)	66(8.25%)	51(6.37%)
Autoimmune disorder	0	4(0.5%)	9(1.12%)
Chronic renal disease	0	2(0.25%)	3(0.37%)

There were no women with history of smoking or alcohol consumption. 4% of the women with history of tobacco chewing had recorded osteoporosis. Patient data is tabulated in Table 1.

The association of diabetes with that of osteopenia and osteoporosis was 4.25% and 2.37% respectively. There was no association of duration of diabetes with that of the prevalence of reduced bone density. 2.37% of the women with hypothyroidism had osteoporosis and the duration of hypothyroid more than 10 years had at least one episode of fragility fracture. 1.125% of the women with history of steroid intake for more than 5 years had T – score of <-2.5. Table - 2

Discussion

In our community based study, 21% of the postmenopausal women had osteoporosis and 42.5% had osteopenia, in comparison to a sty conducted by

Miura et al on the urban women in Philippians, who reported the prevalence to be 19.8% [15]. The independent associated factor with osteoporosis was elderly population lower body weight, duration of menopause.

In our 'study, we noted that the very low BMI and higher BMI both had a higher prevalent of osteoporosis in comparison to the normal weight women, whereas a study conducted in the USA and France reported the BMI increases in higher weight people [16].

Regular walk which was the only mode of exercise in 98% of the women did not have any protective role. A systematic study states that moderate daily walk of 30 minutes and weight bearing exercise 2 times a week has a protective role against osteoporosis [17,18].

We found no significant influence on the education state to that of the prevalence of osteoporosis, in contrast to our study a study conducted by Tolea et al on the Mexican American women, where they found a higher prevalent of osteoporosis in the educated populations [19]. A study conducted by Hien et al reported the prevalence of the osteoporosis to be significantly lower in the educated population [9].

In our study, we did not find any significant association of diabetes and osteoporosis, which was the similar results obtained by Pajouhiet al [20] but a study conducted by Miam at al found significant associate between the two [21].

2.37% of the women with hypothyroid had osteoporosis but there is no significate association between the two, whereas only 4 women were diagnosed hyperthyroid and all the 4 women had their T- score <-2.5, as reported by Folis et al, he explained the association between the elevated thyroid hormone and bone erosion [22].

A larger community based study has to be conducted to find the prevalence of the disease and determine risk factors and complications associated with it. The need of regular screening and early detection and intervention of the drug therapy among the postmenopausal women.

Conclusion

Osteoporosis is a condition which affects people of all age, but due to the lack of estrogen hormone in the postmenopausal women the prevalent is higher. It is a public health problem which increases the morbidity and mortality. This condition is a silently progressing disease which may not have any clinical presentation till complication like fragility fractures, bone pains, spine fractures occur. In our study the prevalence of the reduced bone density was high, and hence the early screening and detection of the condition and actively treating the condition in the osteopenia stage has to be followed to prevent complications. Routine health education, calcium and vitamin d supplementation has to be given in vulnerable population.

Refferance

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