

Cross Sectional Study of Osteoporosis among Pre and Post Menopausal Women of Raipur City

Anuradha Chakraborty¹, Moyna Chakravarty²

S.O.S. in Anthropology, Pt. Ravishankar Shukla University, Raipur (C.G.)

Abstract: *Being diagnosed with osteoporosis is serious and breaking a bone due to osteoporosis is even worse. Millions of people are struggling with their bone health and develop a feeling, as if, their future is completely out of their control. But our body is a miraculous machine and over thousands of years it has been designed for life. We need the right information, at the right time, to make smart choices to lead a better life when it comes to the health of our bones. In other words, if an individual is diagnosed, way before that he or she might be a victim of osteoporosis and have a chance of getting a fracture, then measures can be taken to avoid such a situation. The present paper was an approach to identify the individuals with osteoporosis who have never been diagnosed before from the otherwise normal volunteers willing to participate in the study. The data was analyzed and the results showed a high prevalence of osteopenia and osteoporosis among the pre and post menopausal women attending the various gynaecological centres of Raipur city with some obstetric problems. Significant difference was observed between osteoporosis and previous fracture, menopausal status, frequent falls and age. On the other hand, BMI, weight and caste distribution showed non – significant difference.*

Keywords: Osteoporosis, Bone mineral density, BMI, QUS

1. Introduction

Osteoporosis is a skeletal disorder characterized by compromised bone strength predisposing to an increased risk of fracture. Osteoporosis is a disease characterized by reduction in the bone mass and disruption of bone architecture leading to impaired skeletal strength and increased susceptibility of fractures (Lane, 2006). It occurs silently and progressively, reflected only in a low bone mineral density, and generally not realized until the first fracture occurs.

Osteoporosis is a major cause for morbidity and mortality in adult Indian men and women and is widely prevalent in India (Gupta, 1996). It is estimated that approximately 26 million Indians are affected by osteoporosis with the numbers projected to increase to 36 million by the year 2013 (Action Plan Osteoporosis: Consensus Statement of an Expert Group, 2003). Studies have showed that osteoporotic fractures occur 10- 20 years earlier in Indian women and men than their western counterparts (Alekel, Mortillaro, & Hussain, 1999). Osteoporosis, which literally means porous bones, is a serious global health issue affecting one in every third woman and one in every five men over the age of 50 (Melton et al., 2005). There is a positive correlation between BMD and body weight to the order of 0.3 to 0.6 (Felson et al., 1993). The key for early diagnosis of osteoporosis is to measure the bone mineral density, so that effective preventive and therapeutic measures could be taken at the earliest. Low trauma fracture, being the ultimate consequence of osteoporosis, is a global health concern because of its close association with increased mortality, morbidity, health care costs and reduced quality of life (Center et al., 1999; Cummings & Melton, 2002).

Due to the lack of awareness as well as due to lack of facilities available for the measurements of bone mineral density a proper screening for the people who are likely to be affected by osteoporosis is not done in Indian context. Limited numbers of population based studies have been

done so far in our country. Hence the prevalence of osteoporosis in India has not been established yet. Therefore, such kind of studies are essential for knowing the prevalence of the disease, area and region wise.

The prevention of osteoporotic fracture is an important clinical goal since it will reduce mortality, morbidity as well as the expenditure on health care. Due to the availability of several drugs which can help to increase the BMD and reduce fracture risk, the relevance of identifying those with osteoporosis before any fracture has occurred is more important. These medications can achieve significant reductions in fracture rate even in elderly patients with low bone mass and previous fractures.

With both life style predictors and chemical occurrence in the body a great deal is coming to light on osteoporosis revealing new insights to medical professionals. There is rarely one single explanation for the onset of bone density loss but instead there are a series of interdependent bodily changes leading to condition's development. However, there are several demographic features like ethnicity, which indicate some individuals to be at high risk groups hence more actively recommended for screening. Those having a family history of bone density loss or osteoporosis and the post-menopausal women other than elderly individuals are most impacted and demanding for screening.

2. Materials and Methods

A cross sectional community based epidemiological study was conducted in order to study the prevalence of osteopenia and osteoporosis. The present study was carried out between September 2014 to July 2015. Camps were organized in various gynecological centres. Total of 191 women above the age of 35 years attended the camps. Sociodemographic variables were collected by means of semi structured schedule. The present study was approved by the institutional ethics committee. Consent was taken from all the respondents. Informations on calcium intake, sunlight

exposure, exercise schedule, fear of falls and preventive behaviours were gathered through interview method. Besides this, the questionnaire included information's on menstrual, obstetrics and medical history.

All the women attending the camps were counseled for adoption of dietary modifications and physically active life style as first step towards prevention of falls and fractures.

3. Result and Discussion

The bone mineral density of 191 women were examined and the results have been presented in Table 1-7. The women attending the camps were classified into osteopenic and osteoporotic following the classification of W.H.O. on the basis of T Score. The respondents belonging to 35 years and above were only selected to classify them into pre menopause and post menopause category. The results showed low BMD to be a significant predictor variable for osteoporotic fractures.

The prevalence of osteoporosis in the present study was 60.73% and osteopenia was 18.32% while only 20.94% were normal which is very alarming. Highest percentage of women were classified as osteopenic in both pre and post menopausal group and after which the percentage declined in 61-70+ age group. Osteopenic cases also increased with advancement of age in pre and post menopausal women but in this case the incidence of osteoporosis was observed to be 85.72% in 71-80 years age group which may be perhaps due to the old age. Chi – square value was computed for age wise distribution of osteoporosis $\chi^2 = 58.86$, d.f = 8 which showed significant difference at level of 0.050 .

The study showed that there was statistically significant relationship between osteoporosis and previous fractures ,age, frequent falls and menopausal status .Where as BMI , caste distribution and weight showed non significant difference.Between the age group of 61-70 and 71-80 , non of the respondents fell under normal criteria for BMD.53.33% woman had osteoporosis between the age group of 61-70 and a further increase as high as 83.72% was observed in the age group of 71-80.The higher percentage of osteopenia in pre menopausal woman than the post menopausal category indicates that there is an urgent need for the early screening for osteoporosis among the woman folk.

In a cross sectional study the prevalence of osteoporosis and osteopenia was found to be 13.3%±5.29% and 48.1%±7.79% respectively. The study also showed statistically significant association of prevalence of osteopenia and osteoporosis with age group, gravida status, attainment of menopause, body weight and physical activity (Agrawal & Verma, 2013).Similar association have also been found in the present study.

In a hospital based study among the urban woman above the age of 25 years utilizing calcaneal QUS the prevalence of osteoporosis and osteopenia was 20.25 % and 36.79 % (Sharma et al., 2006).The present study also shows a high prevalence rate of osteopenia and osteoporosis.

In a study of bone status among the Indian women belonging to low income group aged 30 – 60 years ,it was found that BMD at all the skeletal sites was much lower than the values reported at the developed countries . There was a high prevalence of osteopenia (52%) and osteoporosis (29%). Inadequate nutrition was considered to be the major cause for the poor bone health(Shatrugna et al., 2005).

In a more recent study from Delhi, 792 males and 808 postmenopausal females with a mean age of 57.67 ± 9.46 years were evaluated. Osteoporosis was present in 35.1% of subjects (M-24.6%, F-42.5%) and osteopenia in 49.5% (M-54.3%, F-44.9%). Both of these studies used the manufacturer's White Caucasian reference database (Marwaha et al., 2011)

There is a universal concurrence in the available literature that the incidence of osteoporosis increases as the age advances with a spontaneous increase in the osteoporotic fractures among the women.This might be due to the imbalance between bone resorption and formation with ageing especially in post menopausal women.

4. Conclusion

The present study suggests that the calcaneal QUS method utilizing the WHO score criteria is a potential screening tool because of the feasibility, low cost and portability. It helps in identifying osteopenia and osteoporosis in a substantial female population who otherwise shall remain unnoticed and undiagnosed and face the complications of osteoporosis. Since osteoporosis is a silent disease and will not be noticed until fracture occurs, this may lead to under diagnosis and under treatment of the disease in pre and post menopausal women of Raipur who are at high risk for osteoporosis. Maintaning a healthy life style with proper diet ,weight bearing exercises and sunlight exposure can have positive impact on maintaning a good bone health of Indians .Thus there an is a urgent need for creating public health awareness in this regard which will create a significant reduction in the risk of fractures and associated morbidity and mortality .For effective strategies emphasis needs to be given at three level of combinations, (a) universal primary prevention , (b) selective prevention in high risk groups , and (c) prevention targeted at individuals .

Table 1: Age wise distribution of Osteopenic and Osteoporotic among pre and post-menopausal women

Age Group In Years	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
31-40	23 (41.07%)	31 (55.36%)	2 (0.04%)	56
41-50	14 (18.18%)	53 (68.83%)	10 (12.99%)	77
51-60	3 (8.33%)	24 (66.67%)	9 (25%)	36
61-70	-	7 (46.67%)	8 (53.33%)	15
71-80	-	1 (14.28%)	6 (85.72%)	7
Total	40 (20.94%)	116 (60.73%)	35 (18.32%)	191
Chi square value = 58.86, Degree of Freedom (d.f.) = 8, p value = 0.050				

Note : Figures in parenthesis are row percentages.

Table 2: Distribution of previous fracture among the women of Raipur

Previous Fracture	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
Yes	4(9.52%)	15(35.71%)	23(54.76%)	42
No	36(24.16%)	101(67.78%)	12(8.06%)	149
Total	40(20.95%)	116(60.73%)	35(18.32%)	191
Chi square value = 47.87, Degree of Freedom (d.f.) = 2, p value = 0.050				

Table 3: Table showing menopausal status of the respondents

Menopause Status	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
Pre	34(33.66%)	59(58.42%)	8(7.92%)	101
Post	6(6.67%)	57(63.33%)	27(30%)	90
Total	40(20.95%)	116(60.73%)	35(18.32%)	191
Chi square value = 29.43, Degree of Freedom (d.f.) = 2, p value = 0.050				

Table 4: Table showing the category distribution of the respondents

Caste	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
General	21(24.14%)	50(57.47%)	16(18.39%)	87
SC	11(18.64%)	40(67.80%)	8(13.56%)	59
ST	2(25%)	4(50%)	2(25%)	8
OBC	3(10.34%)	18(62.07%)	8(27.59%)	29
Minorities	-	8(100%)	-	8
Total	37(19.37%)	120(62.83%)	34(17.80%)	191
Chi square value = 10.42, Degree of Freedom (d.f.) = 8, p value = 0.050				

Table 5: Distribution of frequent falls among the respondents

Frequent Falls	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
Yes	4(8%)	30(60%)	16(32%)	50
No	36(25.53%)	86(60.99%)	19(13.48%)	141
Total	40(20.95%)	116(60.73%)	35(18.32%)	191
Chi square value = 12.34, Degree of Freedom (d.f.) = 2, p value = 0.050				

Table 6: Distribution of BMI among the respondents

BMI	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
<18	1(50%)	1(50%)	-	2
18-24.9	18(15.38%)	74(63.25%)	25(21.37%)	117
25-29.9	21(30.88%)	39(57.35%)	8(11.77%)	68
>30	-	2(50%)	2(50%)	4
Total	40(20.94%)	116(60.73%)	35(18.32%)	191
Chi square value = 11.72, Degree of Freedom (d.f.) = 8, p value = 0.050				

Table 7: Distribution of weight among the respondents

Weight Kg	Normal n (%)	Osteopenic n (%)	Osteoporotic n (%)	Total
<50	2(7.14%)	21(75%)	5(17.86%)	28
51-60	7(13.72%)	30(58.82%)	14(27.46%)	51
61-70	25(26.31%)	56(58.95%)	14(14.74%)	95
71-80	6(35.29%)	9(52.94%)	2(11.76%)	17
Total	40(20.94%)	116(60.73%)	35(18.32%)	191
Chi square value = 11.35, Degree of Freedom (d.f.) = 6, p value = 0.050				

Note- Figures in parenthesis are row percentage

References

- [1] Agrawal, T., & Verma, A. K. (2013). Cross sectional study of osteoporosis among women. *Medical journal of armed forces of India*, 168-171.
- [2] Alekel, D. L., Mortillaro, E., & Hussain, E. A. (1999). Lifestyle and biologic contributors to proximal femur bone mineral density and hip axis length in two distinct ethnic groups of premenopausal women. *Osteoporosis International*, 327-338.
- [3] Center, J., Nguyen, T. V., Schneider, D., Sambrook, P. N., & Eisman, J. A. (1999). Mortality after all major types of Osteoporotic fractures in men and women: An observational study. *Lancet*, 878-82.
- [4] Cummings, S., & Melton, L. J. (2002). Epidemiology and outcomes of Osteoporotic fractures. *Lancet*, 1761-7.
- [5] Felson, D., Zhang, Y., Hannan, M. T., & Anderson, J. J. (1993). " Effects of weight and body mass index on bone mineral density in men and women: The Framingham study. *Journal of Bone and Mineral Research*, 567-573.
- [6] Gupta, A. (1996). Osteoporosis in India - The nutritional hypothesis. *The National medical Journal of India*, 268-274.
- [7] Lane, N. E. (2006). Epidemiology , etiology and diagnosis of osteoporosis. *American Journal of Obstetrics Gynecology*, 194 :S3-11.
- [8] Marwaha, R. K., Tondon, N., Garg, M. K., Kanwar, R., Narang, A., & Sastry, A. (2011). Bone health in healthy population aged 50 years and above. *Osteoporosis International*, 22-29.
- [9] Melton, J., Chrischilles, E. A., Cooper, C., Lane, A. W., & Riggs, B. L. (2005). How many woman have Osteoporosis. *Journal of Bone and Mineral Research*, 886-892.s
- [10] OSI. (2003). *Action Plan Osteoporosis : Consensus Statement of an Expert Group*. New Delhi: Osteoporosis society of India.
- [11] Sharma, S., Tandon , V. R., Mahajan, A., Kour, A., & Kumar, D. (2006). Preliminary screening of osteoporosis and osteopenia in urban women from Jammu using calcaneal QUS. *Indian Journal of Medical Science*, 183-189.
- [12] Shatrugna, V., Kulkarni, P. A., Kumar, P. A., Rani, K. U., & Balakrishna, S. (2005). Bone status of Indian Woman from a low income group and its relationship to the nutritional status. *Osteoporosis International*, 1827-1835.

Author Profile

Anuradha Chakraborty, Research Scholar, S.O.S. in Anthropology, Pt.Ravishankar Shukla University, Raipur (C.G.)

Moyna Chakravarty, Professor, S.O.S. in Anthropology, Pt.Ravishankar Shukla University, Raipur (C.G.)