



Prevalence of Osteopenia & Osteoporosis Among Women in Bhuj, Gujarat, India- A Cross-Sectional Study

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ABSTRACT

The present study was carried out to screen the bone status (osteopenia and osteoporosis) above the age of 35 yrs in the women. A cross sectional study was carried out in 158 women by calculating WHOOT-scores utilizing calcaneal QUS as diagnostic tool. The prevalence of osteoporosis and osteopenia was found to be $12.9\% \pm 5.31\%$ and $48.3\% \pm 7.81\%$ respectively. Statistical association of prevalence of osteopenia and osteoporosis was found to be significant with age group; gravida status; attainment of menopause; body weight and physically active status of the women. The statistical association was not significant in relation to the rank status of their husband, as well as dietary pattern of the women but still it has to be substantiated by conducting larger community based trials in future. The present study found that there was statistically significant relationship between age group and the prevalence of osteopenia and osteoporosis. There was a negative correlation between age of the women and BMD. Besides age, gravida status and menopausal status have negative correlation with BMD while positive correlation with physically active lifestyle.

KEYWORDS

Bone, Correlation, Osteopenia, Osteoporosis, Women,

Introduction

Osteoporosis is a disease characterized by lessening in the bone mass and disruption of bone architecture leading to impaired skeletal strength and increased susceptibility of fractures.¹ Vertebral, hip, and other fragility fractures in women, associated with osteoporosis in later half of life find their foundation in pre- and peri-menopausal period with a variety of factors affecting the bone mineral metabolism.² These include non modifiable factors like female sex, old age, small thin built, ethnicity and family history of fractures. Important modifiable risk factors include calcium and vitamin D deficiency; sedentary lifestyle, smoking; excessive alcohol and caffeine intake.³ Prevention and treatment of osteoporosis consist of non-pharmacological & pharmacological measures. The benefits of the three components of non-pharmacological therapy are well established which includes diet, regular weight bearing exercises and cessation of smoking & alcohol consumption.^{3,4} Measuring the bone mineral density (BMD) remains the only important tool in the early diagnosis of osteoporosis, so that effective preventive and therapeutic measures can be initiated at the earliest. The gold standard for measuring bone density however is Dual Energy X-ray Absorptiometry (DEXA), useful tool for both axial and appendicular skeleton. But the commonest used modality of measuring bone density still remains to be calcaneal QUS (Quantitative Ultra Sonography) as it is cost effective, lacks deleterious effect of radiation and is portable, and therefore it can be useful for screening of osteopenia and osteoporosis.^{5,6} There is very slight data on prevalence & incidence of osteoporosis in India.⁷ An understanding of BMD pattern in women aged above 40 yrs is crucial for prevention, diagnosis of osteoporosis and management of its complications in later life.^{8,9} therefore, the current study investigates BMD in the dependant wives of Officers and other ranks of serving personnel, above age of 35 yrs utilizing calcaneal QUS as a screening tool.

Materials & methods

A descriptive cross sectional study was undertaken to study prevalence of osteopenia & osteoporosis and its correlation with epidemiological and socio-behavioral factors amongst dependant women above age of 34 years. The study was carried out during the camp run in March 2014 for estimation of BMD, been sponsored by Elder pharmaceuticals. Total of 200 women attended the camp and informed consent was taken from all. Systemic were excluded from study. Women on long-term medication were also excluded. Thus responses and re-

sults of 42 women were not included for analysis in the present study.

The questionnaire included information on sociodemographic variables, menstrual, obstetrics and medical history. The BMD was measured at calcaneus by standardized QUS utilizing T-scores based on WHO criteria,¹⁰ which were obtained from the automated equipment. T score refers to the ratio between patient's BMD and that of young adult population of same sex and ethnicity. T-score of >1 was taken as normal, between 1 and 2.5 osteopenic and <2.5 as osteoporotic. Those who were diagnosed to be suffering from osteopenia and osteoporosis based on T-scores underwent orthopedic evaluation at Gkg Hospital, Bhuj for further management and follow up.

Analysis was done using SPSS Version 15. The risk factors were analyzed using Chi square test for categorical variables and unpaired t test for continuous variables. The level of significance considered is 5% and confidence interval was set at 95%

Results

In the present study, Maximum number were in age group of 35-45 yrs followed by 45-54 yrs and 55-64 yrs. The mean age was 42.7 ± 3.9 . 89% of women were multigravidae while 29.2% had attained menopause. 41.7% of the women confirmed of being involved in regular physical activity of duration more than 30 min, besides routine. 38.7% of women were normal as per WHO T score criteria, whereas $48.1\% \pm 7.79\%$ had osteopenia and $13.3\% \pm 5.29\%$ had osteoporosis. Among total of 21 osteoporotic women, maximum were recorded in the age group at 55-64 yrs followed by 45-54 yrs and then of 35-44 age group. While studying the age wise trend, it followed increasing trend uniformly [Table 1].

The presence of osteopenia and osteoporosis and other variables was evaluated using Chi square test for categorical variables and unpaired t test for continuous variables. Statistical association of prevalence of osteopenia and osteoporosis was found to be significant with age group; gravida status; attainment of menopause; weight and physically active status of ladies. The statistical association was not significant in relation to rank status of their husband and dietary pattern [Table 2].

Table 1 : Age wise distribution variables

Age group	Normal	Osteopenia	Osteoporosis	Total
35-44	55	43	10	108
45-54	9	26	7	42
55-65	1	3	4	8
Total	65	72	21	158
Chi square value:25.14, degree of freedom:4 P value: 0.0001				

Table 2: Association of variables with prevalence of osteopenia & osteoporosis

Gravid status	Normal	Osteopenia	Osteoporosis	Total
1	13	5	1	19
2 or more	48	71	20	139
Chi square value:8.26, degree of freedom:3, p value:0.05				
Menopause attained	Normal	Osteopenia	Osteoporosis	Total
Yes	2	31	14	47
No	59	45	7	111
Chi square value:30.08, degree of freedom:2, p value:0.001				

Discussion

The prevalence of osteoporosis in the present study was 12.9%± 5.31% and osteopenia 48.3% ± 7.81% with maximum number of both osteoporotics and osteopenic recorded in age group of 55-64 yrs and 45-54 yrs respectively. More than 80.5% of population above 50 yrs was either osteopenic or osteoporotic. The study establish that there was statistically significant relationship between age group and the prevalence of osteopenia and osteoporosis. There was a negative correlation between age of the women and BMD. In a study among urban women above age of 25 yrs utilizing calcaneal QUS by Sharma et al¹⁰ 20.25% and 36.79% were suffering from osteoporosis and osteopenia respectively.

Variable prevalence figures obtained in various studies are largely credited to different study settings like difference in parent population of study samples; whether study is population based or facility based and the different techniques used in assessment of BMD. However there was universal agreement in the available literature that as the age advances, the incidence/prevalence of osteopenia and osteoporosis increases with a resultant increase in the osteoporotic fractures more so among women. This might be because there is an increased imbalance between bone resorption and formation with aging, which is an important cause of osteoporosis in elderly, especially among post-menopausal women.^{1,3}

The present study shows that besides age, gravida status and menopausal status have negative correlation with BMD while positive correlation with physically active lifestyle. These results could not be compared as these factors as a variable has not been reported in the available literature. However larger studies may be required to be carried out to establish such correlation. Vegetarian was more affected population although they varied nonsignificantly from other dietary patterns. This may be due to deficient diet in calcium or low nutrients status.⁸ The same was documented and found to have statistically significant relationship in a randomized study among 30-60 yrs females using DEXA as measuring tool for bone mineral density.⁵ limitations of the present study are Women screened were those who volunteered for check up during camp, although deliberate efforts were made to ensure maximum participation in the camp by the ladies above 35 yrs present in the station.

Conclusion

The present study suggests that calcaneal QUS method utilizing same WHO T score criteria is a potential screening tool because of the low cost, feasibility, portability and helps in identifying osteopenia and osteoporosis in a substantial female population who otherwise shall remain undiagnosed and face the complications of osteoporosis. For the middle aged and el-

derly, early detection and treatment of osteoporosis with available agents can significantly reduce the risk of fractures and associated morbidity and mortality.

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