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Original Article

Osteoporosis among household women: A growing but neglected phenomenon

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ABSTRACT

Background: Osteoporosis is associated with variable morbidity and socio-economic burden and referred as a ''silent epidemic'' with increasing risk among Indian women. The present study was conducted to find prevalence of osteoporosis.

Methods: A descriptive cross-sectional study was conducted in Ranchi city with household women as participants. Data was collected by means of pre-tested structured questionnaire in Hindi language and bone status was screened utilizing calcaneal quantitative ultrasound as a diagnostic tool to estimate bone mineral density from 223 participants and statistical analysis was performed with SPSS software.

Results: The mean age of the participants was 37.9 (5.63) and majority (52.5%) of them were vegetarian. The prevalence of osteoporosis was 8.5% (5.2–13%) while 45.7% (39–52.5%) had osteopenia. We found no significant association of osteoporosis and osteopenia with income, physical activity, and dietary patterns on univariate analysis. There was no statistical significant difference between mean age and BMI of participant among normal, osteoporosis, and osteopenia participant (p value >0.5). Multivariate logistic regression analysis shows that 20% increase chances of risk with five years increase in age, the protective effect of physical activity (22%) and non-vegetarian diet (18%) though not statistically significant.

Conclusion: This study shows that significant number of women had osteopenia/osteoporosis within 35–40 years age group. Intensive information, education, and communication activities with regard to osteoporosis causative factors and preventive measures targeted to household women may play an important role, if started at young age.

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Introduction

Osteoporosis accounts for a significant public health burden globally with varying mortality, morbidity, and adverse impact on socio-economic resources.[1] It causes severe affection and reduction of bony density and quality with eventual increased risk of fractures due to enhanced bony fragility.[2] It has been referred to as a ''silent epidemic'' as generally it goes undiagnosed prior to fractures, particularly of hip, that adversely affect the quality of life.[1] Moreover, fractures affecting vertebrae may result in grave consequences like loss of height, severe backache, and bony deformities.[3] Osteoporosis differs from osteopenia, where the bone mass reduction is of lesser intensity due to higher bone resorption in comparison to bone synthesis.[4]

As per National Health and Nutrition Examination survey (NHANES III), about 14 million American elderly women (>50 years of age) are affected by low bone density (mostly at the hip joint). According to the World Health Organization (WHO), up to 70% of women (>80 years of age) have osteoporosis.[5] However, nationwide data on Indian population is lacking.

Although India is a sun-rich country, deficiency of vitamin D has been reported at all age groups.[6] Avoidance of sunlight exposure due to sociocultural reasons, poor dietary calcium, environmental pollution, and higher 25 (OH)-D-24-hydroxylase enzyme in Indians are few reasons for hypovitaminos D. It has been observed that the annual incidence of osteoporotic fractures in women is much greater than the combined incidence rates of heart attack, stroke, and breast cancer.[7]

The non-modifiable risk factors of osteoporosis include age, sex, ethnicity, reproductive, and family history while modifiable risk factors comprise of body weight, sedentary lifestyle, diet, sun exposure, drugs, and history of smoking and alcohol consumption.[1] Prevention is the single most cost-effective means of managing osteoporosis. Effective prevention encompasses appropriate nutrition, exercise, and a healthy life style. Adequate knowledge and timely awareness about the risk factors among women are important aspects of primordial prevention of osteoporosis.[8]

Timely measurement of bone mineral density (BMD) for earliest detection of osteoporosis is an effective means of prevention and initiation of treatment. According to the criteria established by the WHO, BMD measurement is the main tool for diagnosis. DEXA (Dual energy X-ray absorptiometry) scan remains the gold standard for measuring BMD. In comparison to calcaneal quantitative ultrasound (QUS) method, it measures BMD for both the axial and appendicular skeleton. Hence, the detection rate of osteoporosis and osteopenia is much higher with the former. However, at places where facilities like DEXA scan is not available, calcaneal QUS method is used for detecting osteoporosis or osteopenia. Moreover, calcaneal QUS method is more cost-effective, with easily movable and a portable equipment and lesser radiation exposure. This method has, therefore, become very popular for early detection and intervention in progression of osteoporosis.[9] Many developed countries are maintaining a normative data base for QUS findings for diagnosis of osteoporosis.[10]

There is a considerable void in knowledge regarding burden of illness of osteoporosis for developing countries like India.[11] The available literature is based on studies with a small sample size and in varied populations from which clear inferences could not be withdrawn.[12] Hence, the present study was conducted to estimate the prevalence of osteoporosis (including osteopenia) among reproductive and premenopausal/perimenopausal women of urban locality.

Materials and methods

A descriptive cross-sectional study was conducted in an urban locality of Ranchi city. The study area was demarcated in geographical continuity with the health care establishments in the urban area. The participants of the study were the household women with both reproductive and pre/perimenopausal age group. The purpose of the study was explained and a written and informed consent was obtained from all the women who participated in the study. All the household women available and providing consent at the time of survey were included in the study.

Sample size of 213 participant was calculated based on following criteria; expected prevalence in study population to be 40%, level of absolute precision to be 5%, level of confidence interval to be 95% and applying finite correction for our population. A total of 275 women were contacted and 223 (81.1%) women who consented were finally included in the study.

A pre-tested semi-structured questionnaire in Hindi language was used for interviewing the household women and bone status was noted utilizing calcaneal QUS. Physical activity was defined as at least 30 min of walking on at least 5 days in a week.

The calcaneal QUS was measured using GE lunar Achilles. The results are expressed as stiffness index – a composite of speed of sound (SOS) and broadband ultrasound (BUA). Real time image provides visual confirmation of proper heel placement. Based upon the *T*-score and *Z* score, the instrument gave the reading in terms of color coding which may be Green (Normal), Yellow (Moderate risk of fracture indicative of osteopenia), and Red (High risk of fracture indicative of osteoporosis). The participants suffering from moderate and high risk were informed about their bone status, appropriately advised, and referred to physician for further management.

Statistical analysis was performed using SPSS ver 14.0. The statistical significance among various variables was assessed using Chi-square test for trend. p value of <0.05 was considered statistically significant. Multivariate logistic regression analysis was also carried out by taking that outcome as a binary variable, whereas osteopenia and osteoporosis were treated as outcome of interest.

Results

The mean age and standard deviation (sd) of the participants was 37.9 ± 5.6 years (median age = 37years). Half of them had monthly income of Rs. 20,000–30,000 while 34% had monthly income of Rs. 30,000–45,000. Majority (52.5%) of them were

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