

An Overview Of The Increasing Incidence Of Osteoporosis As A Major Health Issue In Indian Women

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Abstract: -

Osteoporosis is a now becoming the major public health problem in Indian women. The probable causative factors include disturbed lifestyle affecting the diet of an individual's viz. low calcium intakes with extensive prevalence of vitamin D deficiency, increasing longevity, early menopause, genetic predisposition, lack of diagnostic facilities, and poor knowledge of bone health have contributed toward the high prevalence of osteoporosis. . The recent researches also suggest that development of Osteoporosis is more in women than men. This is due to the fact that women have low peak bone mass and small bones than men. They also lose bone mineral density more rapidly than men in middle age because of the dramatic reduction in estrogen levels that occur with menopause. The study was aimed to analyze the prevalence of osteoporosis among women hence relevant data was collected by analyzing different research papers which were published in scholarly journals with the help of scientific electronic database viz. Pubmed, Google scholar etc.

Key words: Osteoporosis, middle age women, BMD

INTRODUCTION

The alarming increase in women those who are suffering with osteoporosis i.e. with reduced bone mass and the disruption of bone architecture, is increasing in India day by day. The prevalence of osteoporosis among women in India was observed from studies as the estimates suggests that of the 230 million Indians expected to be over the age of 50 years in 2015, 20%, i.e. approximately 46

million, are women with osteoporosis. Hence, osteoporosis is a now becoming the major public health problem in Indian women. The probable causative factors include disturbed lifestyle affecting the diet of an individual's viz. low calcium intakes with extensive prevalence of vitamin D deficiency, increasing longevity, early menopause, genetic predisposition, lack of diagnostic facilities, and poor knowledge of bone health have contributed toward the high prevalence of osteoporosis. The recent researches also suggest that development of Osteoporosis is more in women than men. This is due to the fact that women have low peak bone mass and small bones than men. They also lose bone mineral density more rapidly than men in middle age because of the dramatic reduction in estrogen levels that occur with menopause. The study was aimed to analyze the prevalence of osteoporosis among women hence relevant data was collected by analyzing different research papers which were published in scholarly journals with the help of scientific electronic database viz. Pubmed, Google scholar etc.

DISCUSSION

Osteoporosis which is most common form of metabolic bone disease estimated in around 200 million populations is now becoming the growing health concern worldwide, associated with complications such as hypertension and diabetes and other common chronic diseases. It is a disease characterized by reduction in the bone mass and disruption of bone architecture leading to impaired skeletal strength and an increased predisposition for fractures.¹ According to the WHO diagnostic classification, osteoporosis is defined by BMD at the hip or lumbar spine that is less than or equal to 2.5 standard deviations below the mean BMD of a young-adult reference population. Many evolving clinical factors that influence the risk of osteoporotic changes such as poor exposure to sun light, nutritional factors especially calcium deficiency, vitamin D deficiency, post-menopausal hormone mediated metabolic ailments and low Bone Mineral Density .The prevalence of Osteoporosis is observed four times more common in women than in men though some evidence indicates that men tend to have more osteoporosis-related complications.^{2,3}

MATURATION AND PEAK BONE MASS

The physiology of bone maturation and the growth of bone in both the sexes should be understood first before understanding osteoporosis in individuals. Boys usually achieve similar or higher bone density but at a later age compared with girls, which was shown in a Swiss study by Bonjour JP et al (1991) that assessed the bone mass in 207 healthy girls and boys, aged 9 - 18 years. They determined the bone density and content using dual energy X-ray absorptiometry (DEXA) at three major sites: the lumbar spine, femoral neck and mid-femoral shaft. It was observed that boys when compared with girls showed a significant age-related delay in lumbar spine density irrespective of puberty, but at the age of 18 years, both boys and girls reached a similar bone density⁴. Lumbar spine bone content and femoral shaft bone density were significantly higher at age 18 years in boys, which was related to a reduction in bone mass growth that was observed after the age of 15 years in girls. The femoral neck bone density was not significantly higher in boys at age 18 years compared with girls.⁵

In another study done by Avdagic SC et al (2009) evaluated the impact of diet and physical activity on bone density in the lumbar spine, the entire femur and the distal third of the radius using a DEXA scan was taken in a sample of 51 male and 75 female students, aged 19 - 25 years. It was observed that bone density was higher in males at the three measured sites compared to females, with males achieving peak density later than females, especially in the lumbar spine whereas this difference was not explained by varying nutrition or the level of physical activity.⁶ The same theory was also supported by Anderson JJ et al (1996) who also observed that Bone density was higher in males at the three measured sites compared to females, with males achieving peak density later than females, especially in the lumbar spine.⁷Hence we can conclude that, males tend to have higher bone density

and content and they achieve it at later age compared with females whereas this difference is not explained by nutrition, level of physical activity, body weight or lean mass, but it may be because of the bone size.

BONE LOSS AND AGING WITH GENDER DISPARITY

Women tend to have younger onset of bone loss compared with men. A longitudinal study carried by Jones G et al (1994), which included 769 men and women 60 years of age and older, evaluated the annual bone loss using DXA scans at an interval of 2.5 years. The estimated annual bone loss at the femoral neck was 0.82% per year for men and 0.96% per year for women, which was statistically significant, but there was no significant loss at the lumbar spine in either group, likely because of coexistent osteoarthritis⁸. In the same study, the age range where the rapid decline occurred was 74 - 79 years for men compared with 65 - 69 years for women. Estrogen deficiency plays an important role in osteoporosis development for both genders, and it is more pronounced for women and at younger (menopausal) ages compared with men^{9,10}. Hence we can say that men and women tend to lose bone but women tend to lose bone at younger age and at a more rapid pace than men and they also have higher bone resorption markers. Smoking and weight loss are important modifiable risk factors that should be targeted when such patients are evaluated. The periosteal gain in men ameliorates the endosteal bone loss and results in more bone strength compared with women.

DIAGNOSTIC CRITERIA OF OSTEOPOROSIS

The diagnosis of osteoporosis is established by measurement of BMD or by the occurrence of adulthood hip or vertebral fracture in the absence of major trauma (such as a motor vehicle accident or multiple story fall). Laboratory testing is indicated to exclude secondary causes of osteoporosis. The BMD diagnosis of normal, low bone mass (osteopenia), osteoporosis, and severe or established osteoporosis is based on the WHO diagnostic classification.^{11,12}

WHO definition of osteoporosis based on BMD

Classification	BMD	T-score
Normal	Within 1 SD of the mean level for a young-adult reference population	T-score at –1.0 and above
Low bone mass (osteopenia)	Between 1.0 and 2.5 SD below that of the mean level for a young-adult reference population	T-score between –1.0 and –2.5
Osteoporosis	2.5 SD or more below that of the mean level for a young-adult reference population	T-score at or below –2.5
Severe or established osteoporosis	2.5 SD or more below that of the mean level for a young-adult reference population with fractures	T-score at or below –2.5 with one or more fractures

BMD testing is a vital component in the diagnosis and management of osteoporosis. BMD has been shown to correlate with bone strength and is an excellent predictor of future fracture risk. Instead of a specific threshold, fracture risk increases exponentially as BMD decreases. Although available technologies measuring central (lumbar spine and hip) and peripheral skeletal sites (forearm, heel, fingers) provide site-specific and global (overall risk at any skeletal site) assessment of future fracture risk, DEXA measurement at the hip is the best predictor of future hip fracture risk. DEXA

measurements of the lumbar spine and hip must be performed by appropriately trained technologists on properly maintained instruments. DEXA scans are associated with exposure to trivial amounts of radiation.

Biochemical markers of bones are helpful in predicting the risk of fracture independently of bone density in untreated patients, rapidity of bone loss in untreated patients, in estimation of extent of fracture risk reduction when repeated after 3–6 months of treatment with FDA-approved therapies. Biochemical markers of bone remodeling [e.g., resorption markers—serum C-telopeptide (CTX) and urinary N-telopeptide (NTX)—and formation markers— serum bone-specific alkaline phosphatase (BSAP), osteocalcin (OC), and aminoterminal propeptide of type I procollagen (PINP)] are best collected in the morning while patients are fasting¹³

The number of osteoporosis patients reported in India is approximately 26 million; the numbers projected to increase is 36 million by 2013. It is revealed that 4,895 patients in various cities of India, 80% of women and 50% of men of them, suffer from low bone mass, 73.9% of women and 26.2% of men of above 60 years of age among them have been suffering from osteoporosis. Almost all osteoporosis fractures the person's risk of death doubles compared to that of a non-osteoporosis person of the same age and similar circumstances. So the current situation is alarming.¹⁴

In study done by Abirami P et al (2017) was to determine the prevalence of Osteoporosis among middle aged women and to associate the prevalence of Osteoporosis among middle aged women with their demographic and Clinical variables. Quantitative approach and non-experimental descriptive research design was used. The data collection included two parts. Part A: Demographic variables, Part B: Clinical Variables, Part C: Standardized rating scale to assess the bone mineral density. A total of 130 middle aged women who fulfilled the inclusion criteria were chosen as samples by using non-probability purposive sampling technique. The study was conducted at Mamandur, Kancheepuram dt. The data were analyzed and interpreted based on the objectives using descriptive and inferential statistics. Among 130 clients, 28 (22%) have normal T- score (< - 1.0); 66(51%) have osteopenia (- 1.0 to - 2.5); 36 (28%) have osteoporosis (- 2.6 to - 4.0) and there is a statistical significant association on prevalence of osteoporosis among middle aged women with their demographic variables like age and type of family with T – score levels at 95% (P < 0.05).¹⁵

CONCLUSION

Osteoporosis is a metabolic disease that is growing as a major health concern among people slowly and insidiously over many years. Over 300 million people suffer from osteoporosis in India due to disturbed lifestyle, increasing stress, inadequate physical activity, poor nutrition etc that render the bones that eventually become so fragile that they cannot with stand normal mechanical stress. Several studies indicate that more women die of osteoporosis fractures in India than of breast and ovarian cancers. Osteoporosis fractures occur 10-20 years earlier in Indians compared to people in Western countries. India shows the highest prevalence of osteoporosis. One in two Indian women above the age of 35- 45 suffers from osteoporosis. In India, six out of 10 fractures and bone injuries are caused by osteoporosis. Unfortunately, osteoporosis shows no symptom and is often diagnosed only after a fracture, by which time the patient may have suffered considerable bone loss. Hence osteoporosis should be made one the primary focus of concern of health issue that is affecting the most of the women in India.

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