**Original article:**

# To Evaluate Role of Bone Mineral Density to Asses Osteoporosis at Tertiary Care Centre in Men: An Institutional Based Study

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**ABSTRACT**

**Background:** Although the prevalence of osteoporosis is higher in females, males present with higher mortality risk following a fracture. That is true for both vertebral and non-vertebral fractures. Hence, the present study was conducted for evaluating the role of bone mineral density (BMD) to assess osteoporosis at tertiary care centre in men.

**Materials & Methods:** A total 250 male subjects were enrolled. Calcaneal measurement was done in all the subjects for evaluating the bone mineral density. Estimation of BMD was done with quantitative ultrasonography and was expressed in terms of T-score. The patients after assessment of BMD were classified according to WHO criteria as follows: Normal bone mass- T-score $\geq -1.0$, Low bone mass (osteopenia)-T-score $< -1.0$ and $> -2.5$), Osteoporosis-T-score $\leq -2.5$ & Severe or established osteoporosis- T-score $\leq -2.5$ in young adults in the presence of one or more fractures. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

**Results:** In the present study, 45.6 percent of the patients belonged to the age group of more than 60 years. Osteopenia was present in 19.6 percent of the patients while severe osteoporosis was present in 22 percent of the patients. Mean age of the patients with osteopenia, osteoporosis and severe osteoporosis was 38.4 years, 51.8 years, and 63.2 years, respectively. Significantly higher age group of patients were associated with severe osteoporosis.

**Conclusion:** Osteoporosis is more common in males of more than 60 years of age. Hence, early detection and prompt treatment is required to prevent pathological fractures.

**Keywords:** Osteoporosis, Bone Mineral Density, Risk Factors.

**INTRODUCTION**

Osteoporosis is defined as a progressive systemic skeletal disease characterised by low bone mass with microarchitectural deterioration of bone tissue, consequently leading to an increase in bone fragility and susceptibility to fracture. Bone density increases from birth and reaches a peak in both genders in the mid-twenties to early thirties. From age 50 years, bone density in males declines at about 0.2%–0.5% per year. Bone loss in men probably starts progressively and significantly from age 30 years and continues throughout life.[1- 3]

Although the prevalence of osteoporosis is higher in females, males present with higher mortality risk following a fracture. That is true for both vertebral and non-vertebral fractures. Despite high mortality and morbidity in males, unfortunately, most randomized controlled trials for osteoporosis treatment only include postmenopausal

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females, resulting in a challenge in managing osteoporosis in males.[4] Hence, the present study was conducted for evaluating the role of bone mineral density to Assess Osteoporosis at Tertiary Centre in Men.

**MATERIALS & METHODS**

The present study was conducted with aim of evaluating the role of bone mineral density to assess osteoporosis among males. Ethical approval was obtained from intuitional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. A total 250 male subjects were enrolled. Inclusion criteria for present study included: Male subjects reporting to OPD between age group 18-70 years. Exclusion criteria included: Subjects on anti-cancer therapy and subjects with pathologic fractures, or on steroid treatment. Calcaneal measurement was done in all the subjects for evaluating the bone mineral density. Estimation of BMD was done with quantitative ultrasonography and was expressed in terms of T-score. The patients after assessment of BMD were classified according to WHO criteria.[5]

Complete demographic and clinical profile of all the subjects was analysed. Past medical history of significant relevance was also recorded separately. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

**Table 1: WHO criteria for diagnosing BMD**

| Diagnostic category | Criteria |
|---|---|
| **Normal bone mass** | T-score $\geq -1.0$ |
| **Low bone mass (osteopenia)** | T-score $< -1.0$ and $> -2.5$) |
| **Osteoporosis** | T-score $\leq -2.5$ |
| **Severe or established osteoporosis** | T-score $\leq -2.5$ in young adults in the presence of one or more fractures |

**Graph 1: Age-wise distribution**



Age-wise distribution

■ Less than 40   ■ 40 to 60   ■ More than 60

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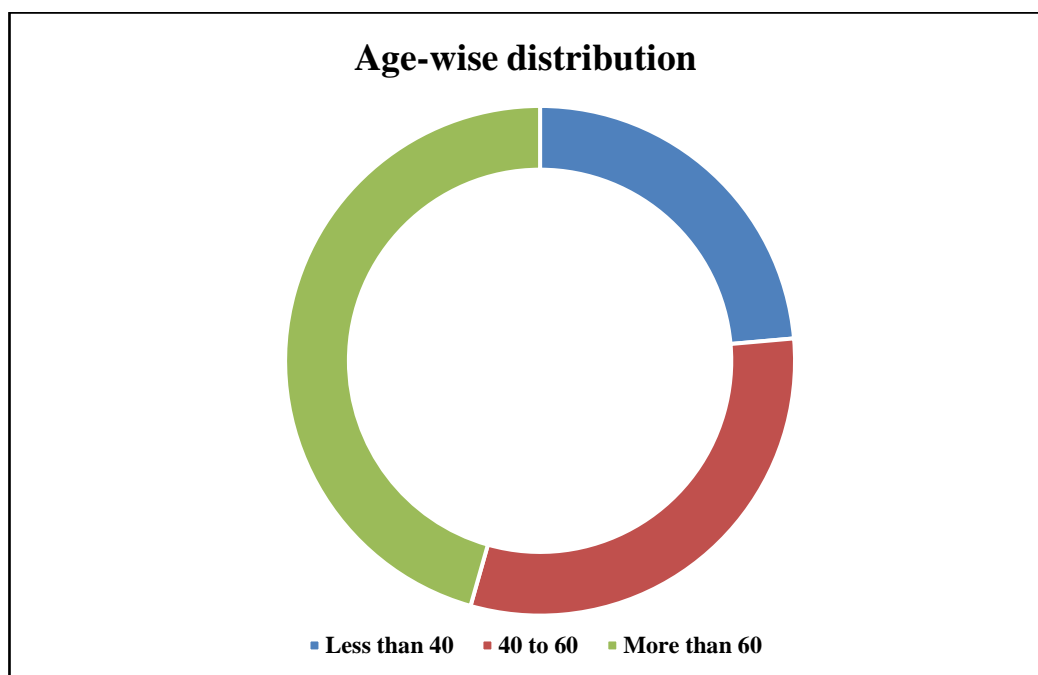
**Graph 2: Clinical presentation**

## Percentage of patients



■ Backache   ■ Generalized bone pain   ■ H/O fracture with mild trauma

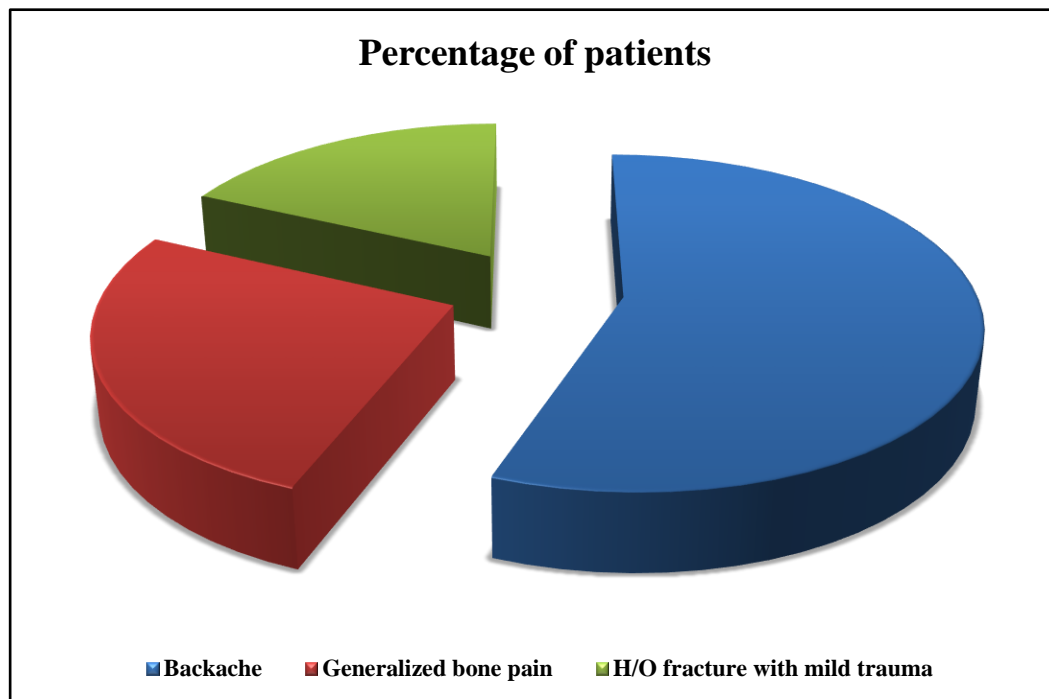**Table 2: Distribution of patients according to incidence of osteoporosis**

| Variable | Number of patients | Percentage of patients |
|---|---|---|
| Osteopenia | 49 | 19.6 |
| Osteoporosis | 46 | 18.4 |
| Severe osteoporosis | 55 | 22 |

**Table 3: Correlation of incidence of osteoporosis with age**

| Variable | Mean age (years) | SD | p- value |
|---|---|---|---|
| Osteopenia | 38.4 | 12.3 | 0.00 (Significant) |
| Osteoporosis | 51.8 | 13.8 | |
| Severe osteoporosis | 63.2 | 15.1 | |

## RESULTS

In the present study, 45.6 percent of the patients belonged to the age group of more than 60 years. 30.8 percent of the patients belonged to the age group of 40 to 60 years. Osteopenia was present in 19.6 percent of the patients while severe osteoporosis was present in 22 percent of the patients. Mean age of the patients with osteopenia, osteoporosis and severe osteoporosis was 38.4 years, 51.8 years, and 63.2 years, respectively. Significantly higher age group of patients were associated with severe osteoporosis.

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## DISCUSSION

Osteoporosis is defined as a reduction in the density and quality of bone. Bone becomes fragile and porous from an imbalance of bone breakdown and bone formation. According to the World Health Organization, osteoporosis occurs when bone mineral density (BMD) is greater than or equal to 2.5 SD below the mean at the femoral neck or total femur. Osteoporosis is a significant public health issue, especially in countries with aging populations. People who have low BMD have an increased risk of fracture and permanent damage.[4-6] Bone mineral density is known to decrease as age advances. Osteoporosis causes significant morbidity and loss of quality of life. Mortality is greater in patients who have osteoporosis in middle-aged and older populations.[7]

The incidence of osteoporosis in males is growing due to multiple factors, including aging of the population, more sedentary lifestyle. It is usually overlooked due to culturally be considered a postmenopausal female medical problem. However, men experience higher mortality and morbidity following fractures. About 50% of men tend to have an identifiable and potentially secondary cause of osteoporosis. Therefore, it is mandatory to perform a careful evaluation for all the possible causes and provide adequate treatment if available.[8-10] Hence, the present study was conducted for evaluating the role of bone mineral density to assess Osteoporosis at Tertiary Centre in Men.

In the present study, 45.6 percent of the patients belonged to the age group of more than 60 years. 30.8 percent of the patients belonged to the age group of 40 to 60 years. Backache was the most common clinical presentation found to be present in 58 percent of the patients. Osteopenia was present in 19.6 percent of the patients while severe osteoporosis was present in 22 percent of the patients. Present study results were in concordance with the results obtained by previous authors who also reported similar findings in their respective studies.

In the present study, mean age of the patients with osteopenia, osteoporosis and severe osteoporosis was 38.4 years, 51.8 years, and 63.2 years respectively. Significantly higher age group of patients were associated with severe osteoporosis. Owing to the increasing fracture risk with aging, the American College of Physicians [Qaseem et al. 2008], the International Society for Clinical Densitometry [Baim et al. 2008] and the American College of Preventive Medicine [Lim et al. 2009] advocate screening men at or after age 70 by dual energy X-ray absorptiometry (DXA) of the spine and hip. For men younger than 70, the presence of risk factors for fracture would also trigger DXA evaluation. When the spine DXA cannot be interpreted because of arthritic changes, a forearm region of interest, usually the distal one third radius should be measured (Binkley N. 2010).[11-13]

These findings are similar to the Tromsø study (Emaus N et al), which showed that BMD begins to decline in men during early–middle-age and progresses into old age. Therefore, it is important to target men in this age group for osteoporosis screening and prevention programs. Osteopenia and osteoporosis screening measures and preventive interventions are needed for early–middle-aged men and women. Screening through DXA scanning is an effective measure for the detection of osteopenia and osteoporosis.[14]

## CONCLUSION

From the above results, it can be concluded that osteoporosis is more common in males of more than 60 years of age. Hence, early detection and prompt treatment is required to prevent pathological fractures. However, further studies are recommended.

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