

Evaluation of Role of Bone Mineral Density to Assess Osteoporosis Reporting to a Tertiary Care Centre

Y Rajshekhar Krishna K*

Assistant Professor, Department of Orthopaedics,
Major SD Singh Medical College and Hospital, Fatehgarh, Farrukhabad, Uttar Pradesh, India.

Article History

Received: 15 Feb 2016

Revised: 07 Mar 2016

Accepted: 22 Mar 2016

*Correspondence to:

Dr. Y Rajshekhar
Krishna K,
Assistant Professor,
Department of
Orthopaedics,
Major SD Singh
Medical College and
Hospital, Fatehgarh,
Farrukhabad, Uttar
Pradesh, India.

ABSTRACT

Background: Men face a 20% lifetime risk of osteoporotic fracture and account for one third of older adults with hip fracture. Hence, the present study was undertaken for analysing the role of Role of Bone Mineral Density for assessing Osteoporosis at Tertiary Centre in Men.

Materials & Methods: 100 male patients, who reported with chief complaint of chronic back pain, fracture from mild trauma or patients with presence of steroid induced osteoporosis were included in the present study. 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. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Results: Osteopenia, osteoporosis and severe osteoporosis were seen in 23 percent, 24 percent and 28 percent of the patients respectively. Mean age of the patients with osteopenia, osteoporosis, and severe osteoporosis was 39.5 years, 50.1 years and 62.2 years respectively. Significant results were obtained while comparing the mean age of the patients with osteopenia, osteoporosis and severe osteoporosis.

Conclusion: Osteoporosis is more common in geriatric males. Hence; early detection and prompt treatment is required to prevent pathological fractures.

KEYWORDS: Osteoporosis, Bone Mineral Density, Risk Factors.

INTRODUCTION

Men face a 20% lifetime risk of osteoporotic fracture and account for one third of older adults with hip fracture. Evaluation and treatment of men with osteoporosis in clinical practice can be challenging and is often overlooked, even after fragility fracture. For men with osteoporosis, providers commonly prescribe oral bisphosphonates, most often alendronate. In addition to alendronate's efficacy, safety, and cost effectiveness, a drug holiday is possible. However, some patients experience a loss in bone mineral density (BMD) or a new fracture despite alendronate therapy. Indeed, a significant loss in BMD despite oral bisphosphonate prescription is a frequent reason for a new patient referral to our tertiary care osteoporosis clinic (KEH) or veterans' osteoporosis clinic (MEE).¹⁻³

Several population-based cohort studies have examined the relationship of urolithiasis and osteoporosis. However, most of the studies were conducted before the introduction of Z-scores based on the dual-energy x-ray

absorptiometry (DXA) scan, which is the current gold standard to evaluate osteoporosis and assess fracture risk. Therefore, it is important to assess vitamin D status in urolithiasis patients who are at higher risk of developing osteoporosis.³⁻⁷ Hence; under the light of above-mentioned data, the present study was undertaken for analysing the role of Role of Bone Mineral Density for assessing Osteoporosis at Tertiary Centre in Men.

MATERIALS & METHODS

Present study was conducted at Department of Orthopaedics, Major SD Singh Medical College and Hospital, Fatehgarh, Farrukhabad, Uttar Pradesh (India) for analysing the role of Role of Bone Mineral Density for assessing Osteoporosis at Tertiary Centre in Men. Written consent was obtained from all the patients after explaining in detail the entire research protocol. 100 male patients, who reported with chief complaint of chronic back pain, fracture from mild trauma or patients

with presence of steroid induced osteoporosis were included in the present study. Patients with presence of any both malignant disorders were excluded. Complete demographic and clinical profile of all the subjects was analysed. Past medical history of significant relevance was also recorded separately. 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.⁶ All the results were recorded in Microsoft excel sheet and were analysed by SPSS software.

Table 1: WHO criteria for diagnosing BMD

Diagnostic category	T-score
Normal bone mass	≥ -1.0
Low bone mass (osteopenia)	< -1.0 and > -2.5
Osteoporosis	≤ -2.5
Severe or established osteoporosis	≤ -2.5 in young adults in the presence of one or more fractures

RESULTS

73 percent of the patients belonged to the age group of more than 50 years. Mean age of the patients was 59.4 years. 18 percent of the patients belonged to the age group of 30 to 50 years. Chronic back pain, generalized bone pain and history of fracture with mild trauma were the clinical profile in 23 percent, 49 percent and 28 percent of the patients respectively. Osteopenia, osteoporosis and severe osteoporosis were seen in 23 percent, 24 percent and 28 percent of the patients respectively. Mean age of the patients with osteopenia, osteoporosis, and severe osteoporosis was 39.5 years, 50.1 years and 62.2 years respectively. Significant results were obtained while comparing the mean age of the patients with osteopenia, osteoporosis and severe osteoporosis.

Table 2: Age-wise distribution of patients

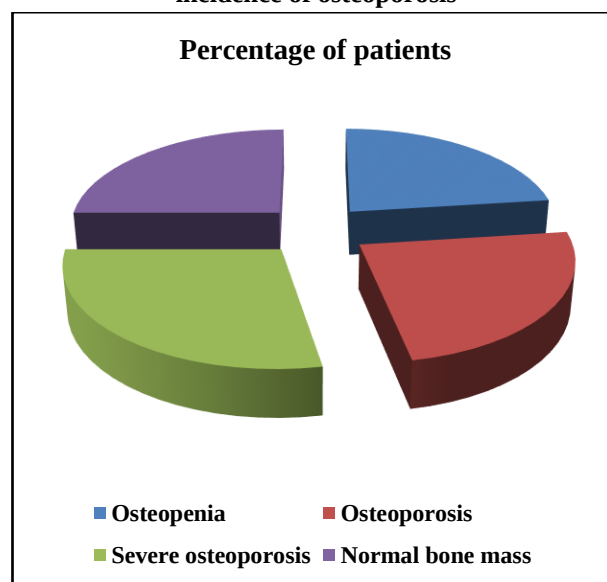
Age group (years)	n	%
Less than 30	9	9
30 to 50	18	18
More than 50	73	73
Total	100	100
Mean	59.4	

Table 3: Clinical presentation

Clinical presentation	n	%
Chronic back pain	23	23
Generalized bone pain	49	49
History of fracture with mild trauma	28	28

Table 4: Correlation of incidence of osteoporosis with age

Variable	Mean age (years)	SD	p-value
Osteopenia	39.5	13.1	0.00 (Significant)
Osteoporosis	50.1	14.8	
Severe osteoporosis	62.2	16.1	
Normal bone mass	23.5	8.6	

Graph 1: Distribution of patients according to incidence of osteoporosis

DISCUSSION

Vertebral fractures are the most common osteoporotic fractures. They are important to detect because they are associated with significant morbidity, mortality, and reduced quality of life, and because they strongly predict future fractures. Furthermore, the increase in fracture risk associated with vertebral fractures is independent of, and additive to, bone mineral density (BMD) measurement. Therefore, having information about vertebral fractures in conjunction with BMD allows clinicians to better assess fracture risk and select appropriate therapies. Because only one third of vertebral fractures found on radiographs are clinically diagnosed, imaging is necessary for their detection.⁶⁻⁹ Hence; under the light of above-mentioned data, the present study was undertaken for analysing the role of Role of Bone Mineral Density for assessing Osteoporosis at Tertiary Centre in Men.

In the present study, 73 percent of the patients belonged to the age group of more than 50 years. Mean age of the patients was 59.4 years. 18 percent of the patients belonged to the age group of 30 to 50 years. Chronic back pain generalized bone pain and history of fracture with mild trauma were the clinical profile in 23 percent, 49 percent and 28 percent of the patients respectively.

Jabin Z et al assessed the pattern of bone density status in a large population of both sexes who attended tertiary hospital National Institute of Nuclear Medicine and Allied Sciences (NINMAS) in a specific time period. A retrospective study was carried out on 2777 patients who were referred to NINMAS for dual energy X-ray absorptiometry (DXA) measurement of bone mineral density (BMD) during the year March 2005 to January 2014. BMD was measured at femoral neck (Ward's triangle) and lumbar spines with a Norland XR-36 machine. Data about age, sex, body weight, presentations, back pain status and menstrual history were recorded. Few of them had known osteoporosis and history of fracture. Reporting was done according to the T score following WHO criteria. Few reports were based on the Z-score. A total of 2777 (M=788, F=1989 with a ratio of 1: 2.5) patients with age ranging from 12 to 85 (mean + SD 43 + 11.1). BMD findings and relevant history were recorded. Results showed normal bone density in 478 (17.21%), osteopenia in 866 (31.18%), osteoporosis in 1108 (39.91%) and discrepancy of BMD in hip and spine in 325 (11.70%) patients. Female patients (n=1989) were sub divided into 6 sub-groups according to age range and significant relationship of bone loss with pre peri and postmenopausal status of women were observed. These 6 groups included women of 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65-74 years and 75-85 years. Among them, the largest subgroups of 845 (42.4%) were of 55-64 years and maximum number (54.9%). of osteoporosis cases were of this age range. About 70% patients experienced low back pain with variable severity and duration. Mean body weight ($\pm$ SD) among the premenopausal women was 49.9 ± 9.4 Kg and 48.2 ± 10.8 kg in postmenopausal women. The results of their study suggested that advancing age and menopausal condition of female and low body weight are important risk factors for the occurrence of low BMD.¹⁰

In the present study, Osteopenia, osteoporosis and severe osteoporosis were seen in 23 percent, 24 percent and 28 percent of the patients respectively. Mean age of the patients with osteopenia, osteoporosis, and severe osteoporosis was 39.5 years, 50.1 years and 62.2 years respectively. Significant results were obtained while comparing the mean age of the patients with osteopenia, osteoporosis and severe osteoporosis. Morris CA et al performed a structured review of current osteoporosis screening guidelines, studies of BMD testing patterns, and interventions to increase BMD testing. They searched medline and Health STAR from 1992 through 2002 using appropriate search terms. Two authors examined all retrieved articles, and relevant studies were reviewed with a structured data abstraction form. A total of 235 articles were identified, and 51 met criteria for review: 24 practice guidelines, 22 studies of screening patterns, and 5 interventions designed to increase BMD

rates. Of the practice guidelines, almost one half (47%) lacked a formal description of how they were developed, and recommendations for populations to screen varied widely.

Screening frequencies among at-risk patients were low, ranging from 1% to 47%. Only eight studies assessed factors associated with BMD testing. Female patient gender, glucocorticoid dose, and rheumatologist care were positively associated with BMD testing; female physicians, rheumatologists, and physicians caring for more postmenopausal patients were more likely to test patients. Five articles described interventions to increase BMD testing rates, but only two tested for statistical significance and no firm conclusions can be drawn. Their systematic review identified several possible contributors to suboptimal BMD testing rates.¹¹

CONCLUSION

Osteoporosis is more common in geriatric males. Hence; early detection and prompt treatment is required to prevent pathological fractures.

REFERENCES

1. Lloyd JT, Alley DE, Hawkes WG. Body mass index is positively associated with bone mineral density in US older adults. *Arch Osteoporos*. 2014 Dec; 9(1): 175.
2. Gonnelli S, Caffarelli C, Nuti R. Obesity and fracture risk. *Clin Cases Miner Bone Metab*. 2014 Jan; 11(1): 9-14.
3. Greenspan SL, Resnick NM, Parker RA. Early changes in biochemical markers of bone turnover are associated with long-term changes in bone mineral density in elderly women on alendronate, hormone replacement therapy, or combination therapy: a three-year, double-blind, placebo-controlled, randomized clinical trial. *J Clin Endocrinol Metab*. 2005; 90(5): 2762-7.
4. Orwoll E, Ettinger M, Weiss S, Miller P, Kendler D, Graham J, Adami S, Weber K, Lorenc R, Pietschmann P, Vandormael K, Lombardi A. Alendronate for the treatment of osteoporosis in men. *New Engl J Med*. 2000;343(9):604-10.
5. Badamgarav E, Fitzpatrick LA. A new look at osteoporosis outcomes: the influence of treatment, compliance, persistence, and adherence. *Mayo Clin Proc*. 2006;81(8):1009-12.
6. Middleton ET, Gardiner ED, Steel SA. Which women should be selected for vertebral fracture assessment? Comparing different methods of targeting VFA. *Calcif Tissue Int*. 2009;85:203-10.
7. O'Neill TW, Felsenberg D, Varlow J, Cooper C, Kanis JA, Silman AJ. The prevalence of vertebral deformity in European men and women: the European Vertebral Osteoporosis Study. *J Bone Miner Res*. 1996;11:1010-8.

8. Watts NB, Lewiecki EM, Bonnick SL, Laster AJ, Binkley N, Blank RD, Geusens PP, Miller PD, Petak SM, Recker RR, Saag KG, Schousboe J, Siris ES, Bilezikian JP. Clinical value of monitoring BMD in patients treated with bisphosphonates for osteoporosis. *J Bone Miner Res.* 2009;24(10):1643–6.
9. Ross PD, Davis JW, Epstein RS, Wasnich RD. Pre-existing fractures and bone mass predict vertebral fracture incidence in women. *Ann Intern Med* 1991; 14:919–23.
10. Jabin Z et al. Pattern of Bone Mineral Density (BMD) Among Patients Attending Tertiary Hospital: 9 years' Experience. *Bangladesh J. Nucl. Med.* 2015; 18(1): 47- 50.
11. Morris CA, Cabral D, Cheng H, et al. Patterns of bone mineral density testing: current guidelines, testing rates, and interventions. *J Gen Intern Med.* 2004;19(7):783-90.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Y Rajshekhar Krishna K. Evaluation of Role of Bone Mineral Density to Assess Osteoporosis Reporting to a Tertiary Care Centre. *Int J Med Res Prof.* 2016, 2(2); 419-22.