

Bone mineral density among postmenopausal Saudi women

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ABSTRACT

Objective: Osteoporosis is reported to be common among postmenopausal Saudi women. The reported incidence varies between 50-60%. Different machines were used to reach these conclusions. At present it is believed that dual energy x-ray absorptiometry (DEXA) is the most accurate method to diagnose osteoporosis. This study was conducted to measure bone mineral density (BMD) measurement of lumbar spine and the upper femur of Saudi postmenopausal women attending orthopedic clinic with unrelated complaints.

Methods: This study comprises of 256 patients attending orthopedic clinics at the King Fahd Hospital of the University, Al-Khobar, Kingdom of Saudi Arabia between January 2002 and June 2003. The data gathered was age, duration of menopause, height and weight for body mass index (BMI) calculation. Women with secondary osteoporosis were excluded from the study. Patients' orthopedic complaints were also recorded in the database. Bone mineral density measurements were carried out using Hologic total body DEXA machine. The data were analyzed using SPSS package.

Results: The data of 256 patients was available for

analysis. The average age of patients screened was 57.62 years (49-76) SD \pm 6.71. The BMI was 21.3-42.9 Kg/m² (SD \pm 5.34). The BMD of the lumbar spine was 0.785 gm/cm² (0.527-1.023) SD \pm 0.142 and that of the hip region was 0.764 gm/cm² (0.500-1.069) SD \pm 0.149. As per the WHO classification 59 women (23%) were classified as normal with T score of -0.82, 78 (30.5%) as osteopenic with T score -2.5 and 119 (46.7%) as osteoporosis with T score -3.58. When the BMD of the hip was analyzed 62 (24.2%) were normal T score -1.0, 81 (31.6%) as osteopenic, T score -2.5 and 113 (44.1%) as osteoporotic, with a T score of -3.1. On the basis of analysis of the lumbar spine 190 (74.2%) had increased risk of fracture as compared to the analysis of hip 59% were at increased risk of fracture.

Conclusions: Our results indicate that postmenopausal Saudi women suffer from osteoporosis and osteopenia higher than those from other parts of the country. Necessary steps are needed so as to avoid osteoporosis and its complications which could end up in epidemic proportions.

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Postmenopausal osteoporosis (PMO) is the silent disease which melts away the bony tissue of the body, affecting millions of the women worldwide. Osteoporosis affects more than 75,000,000 in the United States of America, Europe and Japan alone,¹ causing tremendous economic drain of the country to manage osteoporosis related fractures (ORF). It is still the concept among the health care providers

that osteoporosis is not a problem among Saudi females even though, it was reported from different centers in the Kingdom of Saudi Arabia (KSA), that the prevalence of PMO between 50-70%.²⁻⁷ Earlier reports from this institution was based on plain radiographs which allows the diagnosis of osteoporosis after the loss of 30% of the bone from the body.^{2,3} Since the advent of dual energy x-ray

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absorptiometry (DEXA) measures BMD and osteoporosis, osteopenia can be diagnosed and classified as per the world health organization (WHO) criteria. The severity of osteoporosis varies from region to region due to the influence of day to day activities, exercise and food habits. It has become essential to screen women in all areas of the country to form a national standard. This study was undertaken to measure BMD among postmenopausal Saudi women, living in the Eastern province, attending orthopedic clinics at King Fahd Hospital of the University, Al-Khobar, KSA.

Methods. King Fahd Hospital of the University is a tertiary care center located in eastern KSA and attached to College of Medicine, King Faisal University, Dammam, KSA. There are 4 adult orthopedic clinics seeing approximately 200 patients a week. This study was conducted on consecutive postmenopausal patients attending 2 of the 4 orthopedic clinics, at King Fahd Hospital through June 2003. Postmenopausal women of a minimum of 2-years duration were screened for BMD of the lumbar spine and upper femur, using a DEXA-Hologic scanner. Patients with secondary osteoporosis and risk of developing secondary osteoporosis were excluded from the screening. Weight and height was taken for calculation of the Body Mass Index (BMI) and the cause for attending the clinic. For comparison reference of T-Score used was of "Asian Women" as provided by the Hologic Inc. The data was analyzed using SPSS package.

Results. The data of 256 women was analyzed. Patients screened were suffering from degenerative arthritis (Spine and Knees) The average age of patients screened was 57.62 years (49-76) SD \pm 6.71. The BMI was 21.3-42.9 Kg/m² (SD \pm 5.34). The Bone Mineral Density (BMD) of the lumbar spine was 0.785 gm/cm² (0.527-1.023) SD \pm 0.142 and the cumulative T-Score was -2.3SD and Z Score -1.18SD. The BMD of the hip region was 0.764 gm/cm² (0.500-1.069) SD \pm 0.149 and the cumulative T-Score was -2.1SD and Z Score -0.58SD. As per the WHO classification 59 women (23%) were classified as normal with a T Score of -0.82, 78 (30.5%) as osteopenic with T Score -2.5 and 119 (46.7%) as osteoporosis with T Score -3.58. When the BMD of the hip was analyzed 62 (24.2%) were normal, 81 (31.6%) as osteopenic and 113 (44.1%) as osteoporotic. On the basis of analysis of the lumbar spine 190 (74.2%) had increased risk of fracture as compared to the analysis of hip 59% were at increased risk of fracture. (Table 1).

Discussion. Osteoporosis is an age related loss of bone due to burn out of the ovaries around the

Table 1 - Shows the prevalence of osteopenia, osteoporosis and fracture risk of lumbar spine and upper femur.

Bone mineral density	Lumbar spine	Upper femur
Normal BMD	50 (23) (TS 0.8)	62 (24.2) (TS -1.0)
Osteopenic	78 (30.5) (TS -2.5)	81 (31.6) (TS -2.5)
Osteoporotic	119 (46.5) (-3.58)	113 (44.2) (TS -3.1)
Increased risk fracture	190 (74.2)	151 (59)
TS - T score, BMD - bone mineral density		

age of 50-years, and the hormones of ovaries are essential in bone deposition. The effect of estrogen loss create far reaching consequences leading to fragility fractures which cost the US taxpayers over \$30 billion dollars a year to manage the complications of osteoporosis and not osteoporosis itself. The incidence of osteoporosis in the west is reported to be in the range of 50%, whereas among the Saudi women, the hospital based prevalence is reported up to 70%. Studies have shown as early as 2 decades earlier that Saudi women have low vitamin D level^{8,9} and this further compliments the severity of osteoporosis and its management. This structured prospective clinical study shows that 46% of postmenopausal Saudi women were osteoporotic and additional 31.6% were osteopenic as per the definition of WHO study group.¹⁰ In comparison with the Caucasian women 21-30% is osteoporotic and around 54% osteopenic with increased risk of fractures.¹¹ Earlier reports indicated higher prevalence of osteoporosis when single-photon absorptiometry and radiography was used to diagnose osteoporosis which is not as accurate as the present BMD measurement using dual energy x-rays absorptiometry.¹² Recently El-Desouki⁷ reported a prevalence of 39.9% osteoporotic and 30.6% osteopenic which is not too far from the prevalence in the Eastern province of KSA. With the prevalence of osteoporosis close to that in the Western world, one wonders what should be the incidence of osteoporotic related fractures (ORF). The reported hospital based prevalence was 5.9% in 24 months² and 4/1000.¹³ The incidence of the ORF as low as 4-6 per 1000 women could be due to the difference in the number of elderly population of KSA and the Western countries. In a country of 7,000,000 women, only 2.9% is over the age of 65 years.¹⁴ In the coming decades due to improved health services in the KSA more and more people will live longer and add to the burden on increasing number of ORF. We believe that this is the right period of time to make appropriate interventions to reduce the incidence of osteoporosis so that the incidence of ORF could be reduced.

In conclusion, this study found that majority of the postmenopausal Saudi women either were osteoporotic or osteopenic with increased risk of fracture. We believe that the time is still right to plan and execute large scale screening studies that will form a base for adequate intervention to reduce postmenopausal osteoporosis and ORF.

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