OSTEOPOROSIS, OSTEOPENIA IN MEN OF MARDAN REGION K.P.K PAKISTAN

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ABSTRACT

Objective: To find out the prevalence of osteopenia and osteoporosis in men of Mardan region K.P.K Pakistan.

Design: This was prospectives cross-sectional study.

Place & Duration of Study: The study was conducted in Mardan Medical Complex hospital Mardan from May 2014 to October 2014.

Patients & Methods: Total of one 1726 male participants from 40-70 years were selected randomly for this study. The exclusion criteria were patients below 40 years and above 70 years, chronic steroid user and patients with rheumatoid arthritis and bed ridden. Participants were divided into three groups according to age (40-49, 50-59 and 60-70 years). Quantitative Ultrasound of the calcaneus was done to diagnose osteoporosis. SPSS 20 was used for statistical analysis.

Results: Out of total 1726 participants with the mean age 52.70(7.71) ranged from 40-70 years; 61(3.5%) were osteoporotic and 858 (49.7%) osteopenic. Men (n=874) within age group (50-59 years) had high prevalence of osteoporosis 30(49.2%) and osteopenia 446(52%). Among men (n=324) within age group (60-70 years) had prevalence of osteoporosis 21(34.4%), osteopenia 162(18.9%) and among men (n=528) within age group 40-49 years found 250(16.4%) osteoporotic and 250(29.1%) osteopenic.

Conclusions: Osteoporosis was found to be a common occurrence, affecting males within age group 50-59 years in Mardan region K.P.K Pakistan.

Key Words: Osteoporosis, Prevalence, Bone mineral density

INTRODUCTION

Osteoporosis is means porous bone. A disease pertaining to thinning and loss of bone tissue, consequent upon loss of bone density resulting in fragility and vulnerability to fractures.³ Osteoporosis is a misconception dreamt to be the disease predominantly of females. According to a review article approximately 6% of males over the age 50 years suffers from osteoporosis and its ratio increases with age. According to an evaluation done in 2002 in United States about 2 million men had osteoporosis, while 12 million had osteopenia.² The frequency of osteoporosis in Pakistan is expected to accretion in the anticipating years with an assessment of 11.3 million in 2020 and 12.9 million in 2050.³ A study in Australia concluded that one in three men over 60 will have a fracture due to osteoporosis.⁴ With the advancement of age in men there use to be 1% loss of bone mineral density each year with increasing age.⁵

Osteoporosis is of two types; Type I usually seen in post-menopausal women and 40% of men. Type II
osteoporosis- also called senile osteoporosis; it mostly appears after the age of 75 year. Both female and male affected with a ratio of 2:1.

The obvious osteoporosis in men is; prolong usability of steroids, hormonal disturbance, cigarette smoking and dearth of physical activity, heredity, hypogonadism and vitamin D dereliction. Estrogen and testosterone effects bone tissue over its aromatization to estrogen consequently in few cases, mutations of the aromatase enzymes or estrogen receptors have been associated with severe osteoporosis in men.6,7,8 Amid various hypotheses to prove the mechanism(s) of bone loss in male osteoporosis, a decline in sex steroid hormone manufacturing and/or sensitivity is presumed to play a considerable role. Hypogonadism is contemplated to be an obvious cause of bone loss in women and men. Even though men do not encounter an homologous of the menopause, both estrogen and androgen levels and specifically their bioavailability fractions decreases slowly and progressively after 50 to 60 years of age, causing complex alterations in reproductive physiology.9,10,11,12 The obvious causes of osteoporosis in men is prolonged consumption of steroids, cigarette smoking, hormonal disturbances, dearth of physical activity, hypogonadism and vitamin D deficiency. Estrogen and progesterone affects bone tissue aromatization.13,14,15

The most common initial clinical presentation of male osteoporosis is; back pain, height loss, and fracture, kyphosis. The threshold criteria regarding bone mineral density for men is somewhat controversial. All the while additional data are available, it is justifiable to adopt gender-specific criteria to make a diagnosis of osteoporosis in men (that is a T score 2.5 standard deviation below the young male adverterence mean).16,17

Osteoporosis can be diagnosis by measuring bone mineral density through ultrasound (calcaneal), by DXA scan (dual X-ray absorbmetry), Single Photon Absorptiometry (SPA) and quantitative computerized tomography (QCT). Though DXA scan is superior to ultrasound but significant correlations between bone mineral density values for both techniques have been reported in previous studies.18,19 Bone mineral density by ultrasound is non-invasive method, less costly and easily available than DXA. Ultrasound measures bone mineral density of the heel and converted into T-scores by comparing them with values of average adult populace. WHO describes osteoporosis as T-score of 2.5 or more.20-21 The aim of our study is to find out the prevalence of osteopenia and osteoporosis in men of Mardan region K.P.K Pakistan.

METHODS

The study was initiated after approval of Ethical Review Committee. This was prospective cross-sectional study was conducted in Mardan Medical Complex hospital Mardan from May 2014 to October 2014. Participants included all of those who visited the out-patient department (OPD) of the hospital during the study period and agreed to participate. The participants were explained the purpose of the study and an informed consent was obtained. Sampling technique was non-probability convenience sampling. Total of 1726 male participants from 40-70 years were selected randomly for this study. The participants below 40 years and above 70 years and those with chronic steroid user, rheumatoid arthritis, bed ridden subjects were excluded. Subjects were divided into three group accordingly to age (40-49, 50-59 and 60-70 years). Procedure was explained to the participants and pretest consent was taken. Participants were screened for bone mineral density measurements using Calcaneal Quantitative Ultrasound bone densitometer (SONOSOT 3000 with Software Version: 3.03.06). Machine converted bone mineral density values into T-score and bone fragility was assessed using WHO T-score recommendations. The statistical software SPSS (version 20.0) was used for descriptive statistics.

RESULTS

Out of total 1726 participants with the mean age 52.70(7.71) ranged from 40-70 years; 61(3.5%) were osteoporotic and 858 (49.7%) osteopenic. (Table 1 Figure 1)

The frequency of osteoporosis in age group of 40-49 years of total 528 was 10(16.4%) , in age group 50-59 years is out of total 874; 30 (49.2%) and in age group of 60-70 years out of total 324; 21 (34.4%). The frequency of osteopenia  in age group 40-49 years was;250 (29.1%), in age of 50-59 years; 446 (52%) and in age group 60-70 years was 162 (18.9%). (Table 2)

DISCUSSION

Osteoporosis is a metabolic bone disorder characterized by lessening bone density and declension in
the ubiquity of osteoporosis was noticed by multivariate and univariate which is reported by Meier et al. and more contemporary Jones et al. Hannan et al. These investigators observed a dynamic deterioration in bone mass with age in men and a substantial loss in older men when analyzing the correlation between bone mineral density and age.

In our study the prevalence of osteoporosis in males of age group 50-59 years was 30.9% and 19.8% at age group 60-70 years. A study conducted in Lahore Pakistan reported 20.6% prevalence of osteoporosis in men with age more than 45 years and 10.7% in men whose age was less than 45 years. A study by El-Desouki in Saudi Arabia reported the overall frequency of osteoporosis was 23% in men aged 50 years. In accordance with Garg N et al in India Muzaffarnagar district out of 170 males with age more than 50 years found 60(66.8%) osteopenia and 10(11.1%) had osteoporosis. In Brazil osteoporosis was reported 6.4-16.1% and osteopenia 33.3-57.4% in older men. In Denmark, Westegaard et al. found 17.7% osteoporosis in men of age group 50 years and above. A United Kingdom study showed frequency of osteoporosis 6% in healthy men aged 50 years and older. In Canada the prevalence of osteoporosis was 4.8% of the femoral neck and 2.9% of the lumbar spine.

In our study it is evident that even younger participants age 40-49 years found osteopenic and osteoporotic. This suggests that the process of deterioration of bone mineral density in our male starts sooner than expected, accordingly preventive measures should be accentuate at early ages. Elderly persons are particularly predisposes to deteriorated calcium intake and absorption. In females, oestrogens circumlocuto-ry stimulate calcium absorption from intestine and encourage calcium re-absorption from the kidneys.

A tremendous ration of Pakistani population has dearth of calcium and vitamin D. A hospital-based study from Karachi stated that 92% of the Out Door Patients had vitamin D frailty with female-to-male proportion of 5:1 and mostly had stern deficiency (62%). In another study, the daily calcium consumption of an adult Pakistani was betwixt 400mg and 600mg, in comparison to the implied daily consumption of 1000-1200mg. Another study correlated the nutrient intake of an adult Africa-Caribbean, Pakistani and European found that Pakistani had reduced calcium intake as equate to other communities.

<table>
<thead>
<tr>
<th>BMD T-Score</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoporosis</td>
<td>61(3.5%)</td>
</tr>
<tr>
<td>Osteopenia</td>
<td>858(49.7%)</td>
</tr>
<tr>
<td>Normal</td>
<td>807(46.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>1726(38.2%)</td>
</tr>
</tbody>
</table>

Table 2: Bone Mineral Density T-Score, Sex, Age range cross tabulation

<table>
<thead>
<tr>
<th>Age range</th>
<th>BMD T-Score</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-49 years</td>
<td>Osteoporosis</td>
<td>10(16.4%)</td>
</tr>
<tr>
<td></td>
<td>Osteopenia</td>
<td>250(29.1%)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>268(33.2%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>528</td>
</tr>
<tr>
<td>50-59 years</td>
<td>Osteoporosis</td>
<td>30(49.2%)</td>
</tr>
<tr>
<td></td>
<td>Osteopenia</td>
<td>446(52%)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>398(49.3%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>874</td>
</tr>
<tr>
<td>60-70 years</td>
<td>Osteoporosis</td>
<td>21(34.4%)</td>
</tr>
<tr>
<td></td>
<td>Osteopenia</td>
<td>162(18.9%)</td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>141(17.5%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>324</td>
</tr>
</tbody>
</table>
Early espial and prompt treatment of osteoporosis can considerably reduce the risk of future fractures. It is hardened to entirely rebuild bone that has been depleted by osteoporosis; as a result of prevention of osteoporosis is as substantial as treatment. Lifestyle changes like quitting cigarette smoking, curtailing alcohol intake, exercising regularly and consuming balanced diet with adequate calcium and vitamin D. An adequate intake of calcium and vitamin D are important foundations for maintaining bone density and strength.

Our study had some limitations. First, it was a hospital-based study which might have over-estimated the frequency of osteoporosis. Second, we calculated bone mineral density by using quantitative ultrasound of the calcaneus. Although bone mineral density indices obtained with quantitative ultrasound of calcaneus correlate with those acquired from DXA scan, but DXA is the gold standard and when available, should be used for the measurement of bone mineral density. Due to higher cost of DXA and limited resources, we could not go for it. Still, quantitative ultrasound is a reliable procedure and has been used well in various studies on osteoporosis. There is need for large-scale population-based studies using DXA scan to evaluate the frequency of osteoporosis in the community.

CONCLUSION

The low bone mineral density may indeed represent ethnical variation. Osteopenia and osteoporosis occurs with high frequency among men of age 50-59 years in Mardan region KPK Pakistan. Attempts to reduce the risk of fracture in this population should concentrate on adequate calcium intake and physical activity.

REFERENCES


