Original Article

OSTEOPOROSIS AND OSTEOPENIA IN OLDER WOMEN FROM K.P.K. PAKISTAN

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ABSTRACT

OBJECTIVE: *To determine the prevalence of osteopenia and osteoporosis in Mardan, K.P.K., and Pakistani males.*

STUDY DESIGN: *A prospective cross-sectional study.*

PLACE & DURATION OF STUDY: *From May to October 2014, the research was carried out at the Mardan Medical Complex hospital in Mardan.*

METHODS: *For this research, 1726 male volunteers between the ages of 40 and 70 were chosen randomly. Individuals with chronic steroid usage, those over 70, those under 40, and those with bedridden rheumatoid arthritis were not included. Three age groups were established: forty–49, fifty–59, and sixty–70. Quantitative calcaneus ultrasonography was used to diagnose osteoporosis. To do the statistical study, SPSS 20 was employed.*

RESULTS: *61 (3.5%) and 858 (49.7%) of the 1726 patients, whose mean age ranged from 40 to 70 years, had osteoporosis and osteopenic illness, respectively. Among males (n=874) in the 50–59 age group, osteoporosis 30 (49.2%) and osteopenia 446 (52%) were very prevalent. Men (n = 528) in the 40–49 age range had 250 (16.4%) osteoporotic and 250 (29.1%) osteopenic cases; men (n = 324) in the 60–70 age range had a prevalence of osteoporosis of 21 (34.4%) and osteopenia of 162 (18.9%).*

CONCLUSIONS: *In the Mardan area of K.P.K. Pakistan, osteoporosis was discovered to be a widespread occurrence that mostly affected men in the age bracket of 50-59.*

KEYWORDS: *Osteoporosis, Prevalence, Bone mineral density*

INTRODUCTION

Osteoporosis, which translates as "porous bone," is a condition of the bones marked by bone tissue thinning and loss. This leads to a progressive decline in bone density and an increased risk of fractures. In 2002, it was projected that 2 million men had osteoporosis and 12 million men had osteopenia in the United States[1]. It is anticipated that the number of Pakistanis affected by osteoporosis will increase in the next years, reaching an estimated 11.3 million in 2020 and 12.9 million in 2050 [2]. Eighty-four million women, or over 12% of the total population of seventy million women in our nation, are over fifty years old and many osteoporotic patients [3]. According to the WHO, osteoporosis affects up to 200 million women globally, making it second most common cause of death after cardiovascular disease. Every year, it causes more than 200,000 fractures [4].

There are two types of osteoporosis: type 1, which is more common in postmenopausal women and affects 40% of men. Secondary osteoporosis affects men and women equally and may happen at any age. Main type 2, also called senile osteoporosis, affects

both sexes in a 2:1 ratio and manifests beyond the age of 75. Long-term steroid use, hormone imbalances, cigarette smoking, inactivity, heredity, hypogonadism, and inadequate vitamin D are the main causes of osteoporosis in men. Rarely, severe osteoporosis in men has been related to abnormalities in the aromatase enzyme or estrogen receptors. This is because testosterone and estrogen aromatize to estrogen, which has an impact on bone tissue [5,6,7].

A strong theory to explain the mechanism(s) of bone loss in male osteoporosis is a decrease in sex steroid hormone production and sensitivity. Hypogonadism is believed to be a major factor in bone loss in both men and women. Males do not go through a menopausal transition, although they do progressively lose both estrogen and androgen, particularly its bioavailable fractions, starting in their 50s and 60s. This leads to complex alterations in the physiology of reproduction[8, 9, 10, 11].

Male osteoporosis first manifests clinically as fracture, kyphosis, loss of height, or symptomatic back discomfort. There are disagreements about the threshold values for bone mineral density that should be used to diagnose osteoporotic males. Gender-specific criteria (i.e., a T Until more information is gathered, the score 2.5 SD below the young male reference mean) should be used to diagnose osteoporosis in men.

The findings of an ultrasonography or dual-energy X-ray absorptiometry (DEXA) scan evaluating bone mineral density are used to diagnose osteoporosis. Previous studies have shown a significant correlation between the bone mineral density values acquired using the two modalities, even though DEXA scans are still superior to ultrasounds[18, 19].

The ultrasonic method of measuring bone mineral density is more widely available, less costly, and non-invasive than DEXA. It computes the heel bone mineral density data and compares them with values from the average adult population to convert them into T-scores. The WHO defines an osteoporosis T-score of 2.5 or above[15, 14]. Finding out how common osteopenia and osteoporosis are in men in the Mardan area of K.P.K., Pakistan, is the goal of our study.

MATERIALS & METHODS

The Ethical Review Committee gave its clearance before the trial was started. From May to October 2014, prospective cross-sectional research was car-

ried out at the Mardan Medical Complex hospital in Mardan. Everyone who attended the hospital's outpatient department (O.P.D.) throughout the research period and gave their consent to participate was considered a participant. Informed permission was acquired when the study's goal was conveyed to the participants. Non-probability convenience sampling was the method used for sampling. For this research, 1726 male volunteers, aged 40 to 70, were randomly chosen. Participants under 40 and over 70 years old, as well as those with rheumatoid arthritis, chronic steroid users, and bedridden patients, were disqualified from the study. The subjects were divided into age groups: 40–49, 50–59, and 60–70. Pretest permission was obtained after participants were explained the procedure. Participants were assessed for bone mineral density using a Calcaneal Quantitative Ultrasound bone densitometer (SONOSOT 3000 with Software Version 3.03.06). Bone fragility was evaluated using the WHO T-score guidelines, and bone mineral density results were automatically transformed into T-scores. SPSS (version 20.0) was the statistical program of choice for descriptive statistics.

RESULTS

1305 (60.3%) were osteopenic, 1311 (61.9%) had normal bone mineral density, and 179 (74.6%) were

Table 1: Bone mineral density of total population

BMD T-Score	Frequency
Osteoporosis	179(74.6%)
Osteopenia	1305 (60.3%)
Normal	1311(61.9%)
Total	2795

Age range	BMD T-Score	Frequency
40-49 years	Osteoporosis	27(73.0%)
	Osteopenia	383(60.5%)
	Normal	516(65.8%)
	Total	926
50-59 years	Osteoporosis	67(69.1%)
	Osteopenia	714(61.6%)
	Normal	622(61.6%)
	Total	1403
60-70 years	Osteoporosis	85(80.2%)
	Osteopenia	208(56.2%)
	Normal	173(55.1%)
	Total	466

osteoporotic out of the total of 2795 subjects, whose mean age varied from 40 to 70 years. (Table 1).

The frequency of osteoporosis was 27 (73.0%) in the age group of 40–49 out of 926, 67 (69.1%) in the age group of 50–59 out of 1403, and 85 (80.2%) in the age group of 60–70 out of 466. Osteopenia was more common in the 40–49 age group (383, 60.5%), 50–59 age group (714, 61.6%), and 60–70 age group 208, 56.2%). (Refer to Table 2)

DISCUSSION

A metabolic bone disease called osteoporosis is characterized by a loss in bone density and a breakdown of the microarchitecture of the bone, which may result in fragility fractures[16]. Osteoporosis is the most prevalent bone condition among older people due to the global growth in the geriatric population. It is predicted that by 2050, the risk of hip fractures will grow by around six times due to this demographic shift [17]. In America, eighty percent of women have osteoporosis; in Australia, women have a fifty percent probability of developing osteoporosis before death.18

The risk of osteoporosis rises with age; multivariate and univariate analyses revealed a statistically significant correlation between age and the prevalence of osteoporosis, which is observed by more recent researchers Jones et al [19]. Hannan et al [20]. When these researchers examined the relationship between age and bone mineral density, they found that men's bone mass declined dynamically with age and that older men had a significant loss.

According to our research, in the senior female age range of 40–70 years, the prevalence of osteoporosis was 74.6% and 63.3%, respectively. In a cross-sectional research conducted in Sao Paulo, 320 (32.7%) of the female participants, ages 50 to 96, had an average age of 61.6 (SD 8.5) [21]. In research by Garg Nita et al., 250 women in the rural Muzaffarnagar, India district were found to be 24.1% osteoporotic and 58.6% osteopenic [22].

According to research done in Lahore, Pakistan, males over 45 had a 20.6% incidence of osteoporosis, whereas men under 45 had a 10.7% prevalence [23]. According to research conducted in Saudi Arabia by El-Desouki 28, 23% of males over 50 had osteoporosis. According to Garg N et al[24], among 170 men over 50 in the Muzaffarnagar area of India, 60 (66.8%) had osteopenia, and 10 (11.1%) had osteoporosis. In

elderly males, osteopenia ranged from 33.3 to 57.4%, and osteoporosis from 6.4 to 16.1% in Brazil [25]. 17.7% of males in the 50+ age range in Denmark had osteoporosis, according to Westegaard et al [26]. According to research conducted in the United Kingdom, 6% of healthy males 50 years of age and older had osteoporosis [27]. In Canada, 2.9% of the lumbar spine and 4.8% of the femoral neck had osteoporosis [28].

Our research shows that individuals as young as 40–49 years old had osteoporotic and osteopenic conditions. This shows that the process of our males' bone mineral density loss begins earlier than anticipated; hence, early prevention should be prioritized. Older people are more vulnerable to declining calcium intake and absorption. In females, the circular lacustrine action of estrogens stimulates intestinal calcium absorption and promotes renal calcium reabsorption.

A significant portion of Pakistan's population suffers from low levels of calcium and vitamin D. According to hospital-based research conducted in Karachi, 62% of the Out Door Patients showed stern deficiency, and 92% of them had vitamin D insufficiency with a female-to-male ratio of 5:1.28 In another research, an adult Pakistani's daily calcium intake ranged from 400 to 600 mg, compared to the recommended daily consumption of 1000–1200 mg [29]. An adult African-Caribbean, Pakistani, and European were the subjects of different research that connected nutrient consumption and discovered that Pakistani people consumed less calcium than those in other cultures [30].

Prompt detection and treatment of osteoporosis may significantly lower the chance of further fractures. Rebuilding bone that has been completely destroyed by osteoporosis is difficult, thus preventing osteoporosis is just as important as treating it. Modifications to lifestyle include giving up cigarettes, reducing alcohol use, exercising often, and maintaining a balanced diet that includes enough calcium and vitamin D. Maintaining bone strength and density requires a sufficient diet of calcium and vitamin D.

There were several restrictions on our investigation. Firstly, the research was conducted in a hospital and may have overestimated the prevalence of osteoporosis. Second, we used quantitative ultrasonography of the calcaneus to determine bone mineral density. While bone mineral density indices derived from DXA scans and quantitative ultrasonography of the

calcaneus show a correlation, DXA is considered the gold standard and should be used whenever possible to evaluate bone mineral density. We could not proceed because of the increased expense of DXA and our limited resources. Nevertheless, quantitative ultrasonography is a dependable method that has shown effective in several osteoporosis research. Large-scale population-based studies using DXA scans are required to assess the prevalence of osteoporosis in the general population.

CONCLUSION

The low bone mineral density may be an ethnic variance. The Mardan area in K.P.K., Pakistan, has a significant prevalence of osteoporosis and osteopenia in males between 50 and 59. The focus of efforts to lower this group's fracture risk should be getting enough calcium via diet and exercise.

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