OSTEOPOROSIS IN HEALTHY POSTMENOPAUSAL WOMEN

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ABSTRACT

Objectives: To determine the frequency of osteopenia and osteoporosis using dual energy x-ray absorptiometry in healthy postmenopausal women within five years of onset of menopause and also to compare the menopausal symptoms between two different age groups.

Methodology: This cross sectional study was conducted at the outpatient department of Obstetrics and Gynecology, Fauji Foundation Hospital Rawalpindi from January 1st 2010 to May 31st 2010. DXA scan of the lumbar spine (L2- L4) and right hip (femoral neck) was requested. Osteoporosis was defined by a T-score of ≤ −2.5, osteopenia as T-score between −1 and −2.5, and normal BMD as T-score > −1. Menopausal rating scale was used and all findings were recorded in predesigned proformas.

Results: Out of a total of 33 subjects, who underwent dual energy x-ray absorptiometry, osteopenia and osteoporosis were found in 22 (66.7%) while only 11 (33.3%) have normal results. We took Null hypothesis H_0: $\pi=0.5$ against the alternative H_1: $\pi>0.5$. The test statistics is 22.4 and p value is zero. So H_0 is rejected at all significance levels showing that ratio of abnormal DXA scan findings i.e. osteopenia and osteoporosis among healthy postmenopausal women is significantly much higher than normal findings. Also poor concentration, sexual dysfunctions, urinary symptoms, dyspareunia and joint pains were significantly more common in group II: age >50 than group I: age 50 or below (p-value <0.05).

Conclusion: Osteopenia and osteoporosis are significantly more common in healthy postmenopausal women in early years of menopause. Menopausal symptoms have a significant correlation with advancing age.

Key Words: Menopausal symptoms, Osteoporosis, DXA scanning.

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INTRODUCTION

Osteoporosis has been defined as a disease characterized by low bone mass and micro architectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fractures[1]. This is a disease which may affect many postmenopausal women as with increasing age it has devastating sequelae of fractures Data shows that worldwide 25% of women over the age of 50 will have fractures and half of them i.e. 12.5% will have the risk of osteoporosis [2]. According to World Health Organization, osteoporosis is second to cardiovascular disease as a leading health care problem.

Bone mineral density is known to decrease with age. However in women this process is accelerated by lack of estrogen at menopause preventing the absorption and utilization of calcium[3]. Increase in life expectancy is another concept leading to the development of osteoporosis.

In America 20 million are affected by osteoporosis and approximately 1.5 million fractures occur annually due to it [4]. In India 12 million cases of osteoporosis have been reported in 2007 [2.] The local data is scarce.

Bone mineral density (BMD) is the most important measureable determination of bone health status and osteoporotic fractures [5, 6]. Numerous studies concerning the changes in BMD and menopause have classified women into pre and postmenopausal groups and their results have been published in 1994 [7] & 1995 [8]. However the course of natural femoral bone loss with age and menopause is still controversial but a substantial bone loss has been reported around menopause [7, 9].

Dual energy x-ray absorptiometry (DXA) is the standard test for measuring BMD and all the recent large randomized clinical trials have used DXA of the hip and spine for therapeutic efficacy of the drugs. Analysis performed by the National Osteoporosis Foundation shows that BMD testing is cost effective for postmenopausal women aged 50 to 60 years with risk factors or those beyond the age of 60 with or without risk factors.

The DXA scan works on the principle of absorptiometry i.e. the degree to which tissues absorb radiation. The greater the density, the greater will be the amount of energy absorbed.

We undertook this study to determine the BMD of healthy postmenopausal women who were asymptomatic and were at risk of fractures and also to compare the various menopausal symptoms between two different age groups i.e. those having osteoporosis and the other not having it.

METHODOLOGY

This cross sectional study was conducted in the outpatient department of Obstetrics and Gynecology, Fauji Foundation Hospital Rawalpindi from Jan 1st 2010 to May 31st 2010. The study was approved by the Research Ethics Committee of the hospital and consent form was signed by the patients prior to enrollment in the study. We recruited 70 postmenopausal women but only 33 women were included in the study as 17 did not fulfill the inclusion criteria while 20 women were lost to follow up when they were advised DXA scan. Inclusion criteria were all healthy postmenopausal women who were at least two years postmenopausal whether surgical or medical and with duration of menopause less than five years. Women who were suffering from diabetes, hypertension, hyperthyroidism, bone or any other malignancies, endocrine diseases (parathyroid and adrenal), Paget's disease, chronic renal failure or arthritis, those who were immobilized due to any reason and those who were currently on HRT, anticonvulsants or steroids were excluded from the study. A detailed history was taken followed by general physical examination, breast examination and abdomino-pelvic examination. Height and weight were recorded and BMI calculated. A questionnaire was filled for the various menopausal symptoms according to menopausal rating scale. A complete list of investigations including blood CP, BSR, LFTs, RFTs, PT/APTT, lipid profile, Pap smear and abdominopelvic USG were done. Once the results were within normal limits DXA scan was requested. The DXA measurements were done by performing scans of the lumbar spine (L2- L4) and right hip (femoral neck) and these were according to the manufacturer recommendation using standard software. Osteoporosis was defined by a T-score of ≤ −2.5, osteopenia as T-score between −1 and −2.5, and normal BMD as T-score > −1[10].

We divided our subjects into two groups according to age: group I, 50 or below (n=9) and group II >50 (n=24). Various menopausal symptoms including vasomotor, urogynaecological and psychological were compared between the two groups. All findings were recorded in predesigned proformas.

The characteristics of study population were presented as mean and ± standard deviation. The test of proportion was applied for the ratio of abnormal to normal DXA scan among the study group. Various menopausal symptoms were compared between the two age groups by applying chi-square test. Frequency of various menopausal symptoms was presented as numbers and percentages.

RESULTS

A total of 33 women fulfilled the inclusion criteria. The characteristics of study population are shown in Table 1. The mean age of these women was 48 years. All were married with the mean parity of four children (range 0-10). The mean height was 1.54 meter (range 1.39-1.62), the mean weight 64 kg (range 50-89) and the mean BMI (weight in kg/Height in m^2) was 27.28 kg/m^2.

Table 1: Characteristics of study population

	Mean	± SD
Age (years)	48.2	6.67
Parity	4.52	2.4
Height (m)	1.53	0.05
Weight (kg)	64.3	9.17
BMI	27.28	4.7

Table 2: DXA Scan findings (n=33)

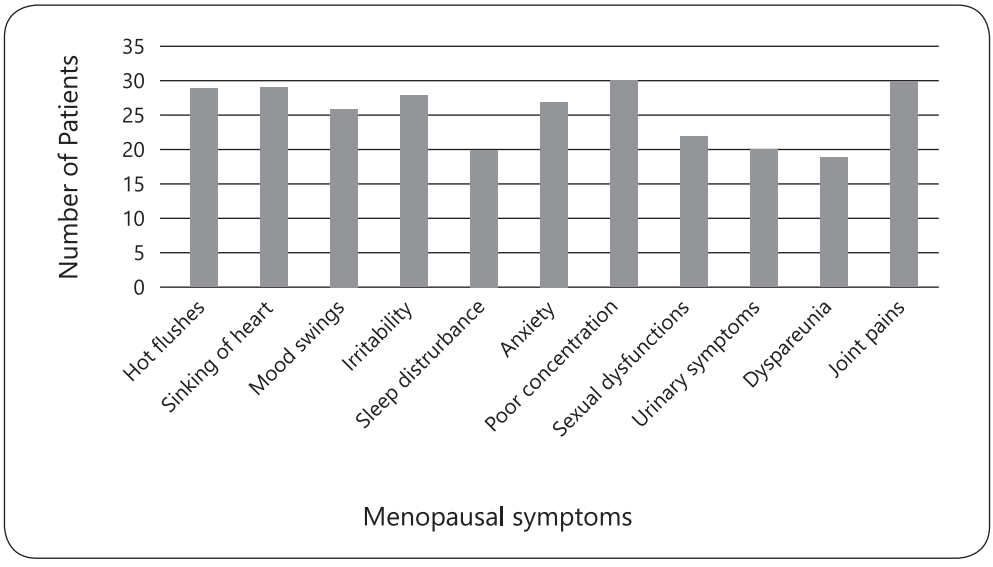
DXA Scan Results		no.	%
Normal		11	33.3
Abnormal	Osteopenia	15	45.4
	Osteoporosis	7	21.3

Table 3: Comparison of menopausal symptoms between two groups

Symptoms		Group I (n=9)	Group II (n=24)	p value
Hot flushes	No	1	3	0.28
	Mild	2	1	
	Moderate	3	5	
	Severe	3	15	
Sinking of heart	No	1	3	0.38
	Mild	3	3	
	Moderate	4	9	
	Severe	1	9	
Mood swings	No	2	5	0.08
	Mild	2	6	
	Moderate	3	8	
	Severe	2	5	
Irritability	No	2	3	0.09
	Mild	4	2	
	Moderate	2	7	
	Severe	1	12	
Sleep problems	No	5	8	0.21
	Mild	1	1	
	Moderate	0	7	
	Severe	3	8	
Anxiety	No	2	4	0.30
	Mild	2	1	
	Moderate	4	11	
	Severe	1	8	

Poor concentration	No	1	2	0.01
	Mild	2	7	
	Moderate	4	8	
	Severe	2	7	
Sexual dysfunction	No	5	6	0.002
	Mild	2	8	
	Moderate	1	7	
	Severe	1	3	
Urinary symptoms	No	5	8	0.0004
	Mild	3	8	
	Moderate	1	5	
	Severe	0	3	
Dyspareunia	No	4	10	0.01
	Mild	3	7	
	Moderate	1	3	
	Severe	1	4	
Joint pains	No	1	2	0.051
	Mild	1	5	
	Moderate	5	5	
	Severe	2	12	

Figure 1: Frequency of menopausal symptoms (n=33)



Our results showed that among our study group of healthy postmenopausal subjects the ratio of women with abnormal DXA scan (osteopenia and osteoporosis) is significantly much higher as compared to those with normal DXA scan (Table 2).

When we compared the menopausal symptoms between the two groups it was found that poor concentration, sexual dysfunctions, urinary symptoms, dyspareunia and joint pains were statistically significant (p value= <0.05) (Table 3).

Regarding the frequency of various menopausal symptoms, commonest were joint pains and poor concentration followed by hot flushes and sinking of heart (Figure 1).

DISCUSSION

In our study population (n=33), with mean age 48.2 years, we found out that ratio of abnormal DXA scan i.e. osteopenia and osteoporosis is significantly higher than normal. The statistical test we applied for the ratio of abnormal DXA scan among the 33 postmenopausal women was by taking Null hypothesis H_0: $\pi=0.5$ against the alternative H_1: $\pi>0.5$. The test statistics is 22.4 and p value is zero. So H_0 is rejected at all significance levels and we concluded that ratio of abnormal DXA scan findings i.e. osteopenia and osteoporosis among healthy postmenopausal women is significantly much higher than normal findings. So it is recommended that DXA scan should be done for this group of patients. Because the risk of fracture increases with increasing age, all guidelines recommend screening of women aged >65 years, regardless of risk factors and in women <65 years with risk factors. The data on screening of women <65 years without risk factors for osteoporosis is scarce[10-13].

However as studies have shown that rapid bone loss occurs in women within five years after the onset of menopause so screening must be considered in this age group[14]. Even some researchers recommend that BMD screening must be repeated within five years in postmenopausal women who have normal baseline BMD. US Preventive Services Task Force recommends that in younger postmenopausal women BMD screening must be done every 5 years while in older postmenopausal women, it must be every 2 years[10].

Recent screen-and-treat strategies recommend that clinical risk factors should be given more attention but still treatment is centered on DXA measurements[15, 16].

Researchers advocate that treatment must be based on screening for bone density as long as DXA is available. In centres where DXA is unavailable, the usage of clinical risk factors alone is justified[17].

We also studied menopausal symptoms between different age groups of postmenopausal women. In our study poor concentration, sexual dysfunctions, urinary symptoms, dyspareunia and joint pains were significantly more common (p value= <0.05) in group II i.e. age > 50 years. The type of menopausal symptoms varies in different studies. In our study joint pains and vasomotor symptoms were the commonest. In a Chinese study the vasomotor symptoms were also significantly associated with menopause[18]. Studies have reported that menopausal symptoms in women aged between 45and 55 years are diverse in nature in different populations[19].

The socio-cultural influences have been attributed by different researchers on diverse nature of menopausal symptoms[20, 21]. Due to the reported influences of sociocultural status we can explain the difference of our results with other studies.

The research has shown that hot flushes, joint pains, sleep disorder, depressive mood, irritability, fatigue and loss of libido are the most common symptoms associated with menopause[22-25]. Most of the symptoms mentioned in above studies are in favor of our findings.

A recent review reported aches and pain, vasomotor, sexual and urinary symptoms, and skin and facial hair changes significantly higher in post-menopausal women (compared with their perimenopause counterparts) [26].

In another review postmenopausal suffer more from physiological symptoms in comparison to early menopausal women[27]. Their findings were consistent with our study. This can also be explained in terms of unstable and highly variable E2 levels reported in the perimenopausal phase, whereas these levels decline gradually in the first year after the last menstrual period and are subsequently stable and low[28]. We were unable to find much of the literature about menopausal symptoms in different postmenopausal age groups. Most of the studies show comparison between peri and postmenopausal symptoms.

The limitations of our study were smaller sample size and cost of DXA scan. Our hospital is a tertiary care hospital where all health care facilities are free for beneficiary patients (army ex-servicemen), so cost of DXA scan was not a problem in our setup. Regarding the smaller sample size this is our ongoing study and soon we shall come up with results on a larger sample size.

CONCLUSION

Osteopenia and osteoporosis are significantly more common in healthy postmenopausal women so DXA scan must be done for early diagnosis and treatment

in this group of patients within five years of onset of menopause. We recommend that health care facilities should aim to increase the availability of DXA scanning.

Menopausal symptoms have a significant correlation with advancing age. Vasomotor and musculoskeletal symptoms are the commonest.

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CONTRIBUTORS

IS conceived the idea, planned and wrote the manuscript of the study. ZH helped in the write-up of the manuscript and necessary revisions. All the authors contributed significantly to the research that resulted in the submitted manuscript.