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Original Article

Prevalence of Osteoporosis Following Menopause

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ABSTRACT

Menopause which is the last menstrual period, is an unalterable and universal part of the age progression involving the female reproductive system. Menopause is labeled after 12 consecutive months of amenorrheic stage. The type of osteoporosis which is most commonly occurred after menopause can be stated as primary type 1, which is also termed as postmenopausal osteoporosis. The current study was done to evaluate the prevalence of osteoporosis following menopause in women of Pakistan. **Methods:** A descriptive study was conducted on 100 females having age above 40 years. The sample size was calculated using the WHO calculator keeping the Study had a six months' time period and data was collected from Lahore General Hospital and Fatima Memorial Hospital. Nonprobability convenience sampling technique was used. The bone mineral density was measured using the DEXA scan. Osteoporosis following menopause was labeled on the basis of WHO criteria. The selected variables were described utilizing the descriptive statistics which is frequency tables, bar graphs and percentages. **Results:** Dual energy X-Ray absorptiometry showed that n=39 (39%) participants were severely osteoporotic with fractures, n=19 (19%) females were found to be osteoporotic, n=29 (29%) osteopenic and n=13 (13%) were normal **Conclusions:** Females following early menopause are at high risk of low bone density that is osteoporosis. Fragility of bone is increased in menopausal women leading to fall injuries and fractures.

INTRODUCTION

Osteoporosis is a systematic skeletal disorder which is described as low bone mineral density the increased destruction of bone tissue. It causes increased osteoclastic activity resulting in the fragile bone structures and high risk of fractures [1]. In osteoporosis the bone protein is changed in amount and variations occur in protein structure [2]. World Health Organization defines osteoporosis as reduced bone mineral density which is 2.5 or lower standard deviation [3]. Osteoporosis can be categorized as primary type one, primary type two and secondary osteoporosis [4]. The type of osteoporosis which is most commonly occurred after menopause can be stated as primary type 1, which is also termed as postmenopausal osteoporosis. Senile osteoporosis which is primary type 2 is associated with age factor, occurring later in 75 years of age or more with a female to male ratio 2:1 [5]. Secondary osteoporosis that usually occur due to some chronic predisposition to medical issues, diseases or chronic medicinal use, can be followed at any stage of life with equal ratio in gender [6]. The risk factors that lead to decreased bone mineral density can be targeted with lifestyle modifications and at times with medications, for complete intervention both of the mentioned strategies are involved [7]. The known lifestyle modifications are dietary adjustments, aerobic exercise and fall prevention strategies. The significant risk factors that contribute to low bone density are advancing age and estrogen insufficiency after the menopause [8]. Menopause which is the last menstrual period, is an unalterable and universal part of the age progression involving the female

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reproductive system [9]. A female undergoing menopause gets through a myriad of indications and symptoms including vasomotor changes, urogenital conditions like vaginal desiccation and painful urination, sleep disorders [10] and mood swings [11]. Hormonal fluctuations and clinical signs ensue over a time period or instantly following the menopause [12]. This time period is commonly known to be climacteric or perimenopausal period, and recently it is devised to refer it as menopausal transition. There are factors that lead to early physiologic menopause stage which includes smoking, autoimmune diseases, lifetime spent on high altitudes, chemotherapy medications, radiotherapy treatment, X carrier and hysterectomy [14].

Menopause is inevitable change through which every woman passes as she touches her middle age or above. It has a varied starting range and it is usually expected to occur in the phase of 42 to 58 years of age [15]. In western world the characteristic age range for last period from natural reasons is usually among 40 and 61 years of age, the average value being 51 years. There is a direct association concerning the deficiency of estrogen following menopause and the progression of osteoporosis. Following the menopause, the breakdown of bone tissue surpasses the bone building tissue [17]. Females are not well aware about the related risk factors of low bone density and osteoporosis in developing countries [18]. The risk of fracture and bone deformation is assessed in postmenopausal females and those with a previous fragility fracture are considered for intervention without the further need of assessment [19]. Commonly seen sites for osteoporosis bone breakage are the lumbar spine, hip region, distal part of forearm and proximal area of humerus [20]. It was proposed in a study that at the time of menopause, the residual lifetime likelihood of fracture in women exceeds that of the breast cancer. The fracture probability is approximately 12% more than the breast carcinoma [21]. In previous literatures the association between osteoporosis and menopause and prevalence in developing countries was calculated. It was evaluated what factors affect the bone density and what likely techniques could be used for the improvement of health status in osteoporotic women [21,22]. Keeping all this in view, the current study evaluated the prevalence of osteoporosis in women following menopause in Pakistan. This study would help the community to minimize the occurrence of osteoporosis in menopausal females by diet and precautions. The study was conducted to evaluate the other reasons which cause the bone fragility and decreased bone density in females.

METHODS

A descriptive study was conducted. Data was collected from 100 females having age above 40 years. Data was collected by using nonprobability convenience sampling technique. Sample size was determined using WHO sample size calculator. Study was conducted between the time period of October 2016 and March 2017 in Lahore General Hospital and Fatima Memorial Hospital. Informed consent was taken from the female patients to participate in this study. Patients who were going through amenorrhea stage for last 5 years were taken in the inclusion criteria of the study. The females who were having osteoporosis because of some other causes than menopause was excluded from this study. Participants having low bone density as a consequence of calcium mineral deficiency or systemic diseases were also omitted from the current study. The bone mineral density was measured using the DEXA scan. Osteoporosis following menopause was labeled on the basis of WHO criteria. The selected variables were described utilizing the descriptive statistics which is frequency tables, bar graphs and percentages.

RESULTS

This descriptive study recruited 100 patients and the time period was six months. DEXA scan was used for the diagnosis of each participant. According to this study, 63% of the females had menopause at the age of 45 to 55 years and n=39 (39%) were severely osteoporotic with fractures, n=19 (19%) females were found to be osteoporotic, n=29 (29%) osteopenic and n=13 (13%) were normal. N=16 (16%) females had no daily sun exposure, n=37 (37%) had 30 min exposure, n=31 (31%) had one hour sun exposure and n=16 (16%) had more than one hour daily sun exposure.

BMD scores	No. of Individuals	Percentage
Normal	13	13 %
Osteopenic	29	29 %
Osteoporotic	19	19 %
Severely Osteoporotic	39	39 %

Table 1: DEXA score

According to this age, age of menarche and menopause, family history of osteoporosis, steroid medication, number of children, fracture due to fall and fracture after menopause, hypertensive, diabetes mellitus and calcium or vitamin D3 intake all had significant association with osteoporosis.

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Value of BMD					
Daily sunlight exposure	**below - 2.5 (osteopo-rosis)**	**between -1.0 &-2.5(oste-openia)**	**-1.0 or above (normal)**	**Total**	**P value**
No exposure	13	2	1	16	.012
30 min exposure.	21	10	6	37	
1 hour exposure	13	14	4	31	
>1 hour exposure	3	11	2	16	
Total	50	37	13	100	

Table 2: Association between BMD and daily sunlight exposure

DISCUSSION

The purpose of the current study was to determine the prevalence of osteoporosis following menopause and also the risk factors associated. According to our study 39% females were osteoporotic with fractures, 19% women had osteoporosis and 29% were osteopenic. A recent study evaluated the prevalence of osteoporosis in India, the study concluded that India has high prevalence, and osteoporotic fractures were thought to occur early in Indian women. Our study concluded that n=56(56%) women had hypertension and n=45 (45%) were taking vitamin and calcium supplements and they had mild risk factors with p-value .030 and .019 and another study evaluated that postmenopausal women with higher blood mercury levels were mostly younger and had advanced vitamin D3 level, consuming the fish and frequency of osteoporosis [23]. A previous study concluded that risk factors of osteoporosis were different diseases and medicinal intake and nullified exposure to sun. In the study it was evaluated that out of 75 patients who had gone through BMD testing 58 had osteoporotic changes and 17 had no evidence of osteoporosis [7]. Our study analyzed that 58% participants had osteoporotic changes specifically in lower lumbar spine region following the menopause, while 13% being normal. The earlier researches had mainly ignored the prime importance of functional activities, sunlight exposure, early menarche and different variables associations. But this current study focused largely on the awareness programs related to risk factor modifications and prevention of bone loss.Our study included a small number of participants and they were recruited from Lahore city. This study focused on the early prevention management of osteoporosis as an important feature that needs to be addressed.

CONCLUSION

Females following early menopause are at high risk of low bone density that is osteoporosis. Fragility of bone is increased in menopausal women leading to fall injuries and fractures.

REFERENCES

[1] Kanis J, Burlet N, Cooper C, Delmas P, Reginster J-Y, Borgstrom F, et al. European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporosis International. 2008;19(4):399-428.doi.org/10.1007/s00198-008-0560-z

[2] Kanis J, McCloskey E, Johansson H, Cooper C, Rizzoli R, Reginster J-Y. European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporosis International. 2013;24(1):23-57.doi.org/10.1007/s00198-012-2074-y

[3] Organization WH. Assessment of fracture risk and its application to screening for postmenopausal osteoporosis: report of a WHO study group [meeting held in Rome from 22 to 25 June 1992]. 1994.

[4] Col NF, Fairfield KM, Ewan-Whyte C, Miller H. Menopause. Annals of internal medicine. 2009;150(7):ITC4-1. doi.org/10.7326/0003-4819-150-7-200904070-01004

[5] Crepaldi G, Romanato G, Tonin P, Maggi S. Osteoporosis and body composition. Journal of endocrinological investigation. 2007;30(6 Suppl):42-7.

[6] Duque G, Demontiero O, Troen B. Prevention and treatment of senile osteoporosis and hip fractures. Minerva medica. 2009;100(1):79-94.

[7] Shokrollahi P, Rivaz M, Robatjaze M. Prevalence of risk factors of osteoporosis in post-menopausal women in Shiraz, southern Iran. Iranian Red Crescent Medical Journal. 2008;2008(3):193-6.

[8] Van der Voort D, Van der Weijer P, Barentsen R. Early menopause: increased fracture risk at older age. Osteoporosis International. 2003;14(6):525-30. doi.org/10.1007/s00198-003-1408-1

[9] Gupta R, Al-saeed O, Azizieh F, Albusairi A, Gupta P, Mohammed A. Evaluation of bone mineral density in postmenopausal women in Kuwait. Journal of Clinical Densitometry. 2012;15(2):211-6.doi.org/10.1016/j.jocd.2011.10.006

[10] Arakane M, Castillo C, Rosero MF, Peñafiel R, Pérez-López FR, Chedraui P. Factors relating to insomnia during the menopausal transition as evaluated by the Insomnia Severity Index. Maturitas. 2011;69(2):157-61.doi.org/10.1016/j.maturitas.2011.02.015

[11] Pien GW, Sammel MD, Freeman EW, Lin H, DeBlasis TL. Predictors of sleep quality in women in the menopausal transition. Sleep. 2008;31(7):991-9.

[12] Freeman EW, Sammel MD, Lin H, Gracia CR, Pien GW, Nelson DB, et al. Symptoms associated with

DOI:https://doi.org/10.54393/pbmj.v5i1.254

menopausal transition and reproductive hormones in midlife women. Obstetrics & Gynecology. 2007;110(2, Part 1):230-40. doi.org/10.1097/01.AOG.0000270153.59102.40

[13] Cunha-Henriques S, Costa-Paiva L, Pinto-Neto AM, Fonsechi-Carvesan G, Nanni L, Morais SS. Postmenopausal women with osteoporosis and musculoskeletal status: a comparative cross-sectional study. Journal of clinical medicine research. 2011;3(4):168.doi.org/10.4021/jocmr537w

[14] Carvalho M, Kulak CAM, Borba VZC. Prevalence of hypercalciuria in postmenopausal women with osteoporosis. Arquivos Brasileiros de Endocrinologia & Metabologia. 2012;56(1):01-5.doi.org/10.1590/S0004-27302012000100001

[15] Svejme O, Ahlborg H, Nilsson JÅ, Karlsson M. Early menopause and risk of osteoporosis, fracture and mortality: a 34 - year prospective observational study in 390 women. BJOG: An International Journal of Obstetrics & Gynaecology. 2012;119(7):810-6.doi.org/10.1111/j.1471-0528.2012.03324.x

[16] Unni J, Garg R, Pawar R. Bone mineral density in women above 40 years. Journal of mid-life health. 2010;1(1):19.doi.org/10.4103/0976-7800.66989

[17] Gopinathan NR, Sen RK, Behera P, Aggarwal S, Khandelwal N, Sen M. Awareness of osteoporosis in postmenopausal Indian women: An evaluation of Osteoporosis Health Belief Scale. Journal of mid-life health. 2016;7(4):180.doi.org/10.4103/0976-7800.195697

[18] Aslan A, Karakoyun O, Güler E, Aydin S, Gök M, Akkurt S. Evaluation of bone mineral density, osteoporosis prevalence and regional risk factors in Turkish women living in Kastamonu: KASTÜRKOS study. Eklem hastaliklari ve cerrahisi= Joint diseases & related surgery. 2012;23(2):62-7.

[19] Demir B, Haberal A, Geyik P, Baskan B, Ozturkoglu E, Karacay O, et al. Identification of the risk factors for osteoporosis among postmenopausal women. Maturitas. 2008;60(3):253-6.doi.org/10.1016/j.maturitas.2008.07.011

[20] Banks E, Reeves GK, Beral V, Balkwill A, Liu B, Roddam A, et al. Hip fracture incidence in relation to age, menopausal status, and age at menopause: prospective analysis. PLoS medicine. 2009;6(11):e1000181.doi.org/10.1371/journal.pmed.1000181

[21] Sakondhavat C, Thangwijitra S, Soontrapa S, Kaewrudee S, Somboonporn W. Prevalence of osteoporosis in postmenopausal women at Srinagarind Hospital, Khon Kaen University. Maturitas. 2009;63:S94.doi.org/10.1016/S0378-5122(09)70374-3

[22] van den Bergh JP, van Geel TA, Lems WF, Geusens PP. Assessment of individual fracture risk: FRAX and beyond. Current osteoporosis reports. 2010;8(3):131-7.doi.org/10.1007/s11914-010-0022-3

[23] Cho GJ, Park HT, Shin JH, Hur JY, Kim SH, Lee KW, et al. The relationship between blood mercury level and osteoporosis in postmenopausal women. Menopause. 2012;19(5):576-81.doi.org/10.1097/gme.0b013e3182377294