Original Article

Risk Factors of Osteoporosis in Elderly Patients

Frequency and Risk Factors of Osteoporosis in Elderly Patients Attending OPD of Abbasi Shaheed Hospital (ASH), Karachi

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ABSTRACT

Objective: To establish the frequency and the factors leading to osteoporosis in aged patients who attended the out-patient department of ASH, Karachi.
Study Design: Descriptive Cross-sectional study
Place and Duration of Study: This study was conducted at the out-patient of major disciplines of a tertiary care hospital of district central, Karachi from February, 2018 to July, 2018 for a period of six months.
Materials and Methods: (male and female) were included after getting written consent. Patients below 40 years were excluded. Sample was selected by non-probability convenience technique. The questionnaire was designed to collect information on social demographic data and risk factors. Analysis was made through software of Statistical Package of Social Scientists 22.0.
Results: In research only 25 % participants were engaged in exercises on usual basis while the remaining participants were doing it infrequently or having the inactive lifestyle. These activities were notably linked with osteoporosis. Study results shows that out of total females (n= 320) fifty percent were obese as compared to male participants and exhibit statistically noteworthy distinction through resulting in p-value of less than 0.05.
Conclusion: The morbidity of osteoporosis in both genders can be reduced by giving education about modifiable risk factors like exercise, obesity and taking drugs.
Key Words: Osteoporosis; Risk factors; Bone mineral density

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INTRODUCTION

Osteoporosis is a chronic, slowly growing disease recognized by low bone mass, changes in bone-architecture and its weakness, and a consequent increase in risk of fractures.[1] Osteoporosis may be primary that is postmenopausal i.e. type I & Old age i.e. type II, and secondary osteoporosis, which is caused by malabsorption, medications such as glucocorticoids or steroids, and some diseases such as hyper-parathyroidism.[1]

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Osteoporosis can be prevented by consuming healthy diet adequate dietary protein, calcium and vitamin D[2.] Age is a factor that leads to high incidence of osteoporosis and a major cause of morbidity and mortality in the aged population are fragility fractures.[3] Type one takes place in a subgroup of women after their menopause especially due to estrogen deficiency and mainly involves the spine and wrist. Postmenopausal bone loss has been a progressive bone loss and is called the "silent thief.[4] Osteoporosis was initially considered as women problem but after an increase in age-related fractures also included the men in this slot.

Vitamin D deficiency in adults can worsen osteoporosis and increase the chances of fracture which may easily be taken from diet or contact to sunlight but affected at places where the body coverage limit sun exposure.[5] One of the most serious complication of corticosteroid treatment is osteoporosis. Fractures in corticosteroid users have been suggested to occur because of bone mass density (BMD) loss.[6] load of osteoporosis is rising in developing nations. In Asian nations it has grown to two folds rise of osteoporotic fracture in last three decades. In Pakistan, around 10 M population with 3/4 fraction of females are involved are women and these

figures are expected to rise to 12.91 million by 2050.[7] one osteoporotic or fragility fracture occurs in every 3 seconds somewhere in the world.[8]

Worldwide 200M population is affected by the osteoporosis which is leading to around 9 million fractures mainly affecting the hips, vertebrae, and distal forearm.[9,10]

The plan of this research was to find the main reasons leading to osteoporosis in local community, and to evaluate the significance of risk factors recognition. This study is expected to create awareness for the modification of life style.

MATERIALS AND METHODS

This descriptive Cross-sectional study was conducted in the out-patient of major disciplines of a tertiary care hospital of district central, Karachi for a period of 6 months from February to July, 2018.

Study subjects: A total 400 patients (male and female) were enrolled after written consent. Female patients below 40 years and male patients below 60 years were excluded. The sample was estimated though the Rao soft software considering the margin of error 5%, with two-sided 95% confidence level with 50% prevalence. The sample size estimated was 377 so we enrolled the 400 potential subjects with consideration of 10% refusal rate.

Sampling Technique: Sample was selected by non-probability convenience technique.

Data: The study subjects were detailed for the procedure and its importance. A pre-tested questionnaire was used for data collection. The questionnaire was designed to collect information on social demographic data and selected risk factors (exercise, exposure to sunlight, history of fractures, intake of milk and dairy products, history of taking steroids, menopause, intake of calcium and vitamin D).

RESULTS

All the information provided by the participants was kept as confidential. Anthropometric measurements for (BMI) were completed through digital scale and height was calculated through measuring tape in inches, which later converted into meter square to calculate the Body Mass Index (BMI) in kg/m^2. The patients had been divided into four groups according to the World Health Organization (WHO) criteria.[11] (Table-1).

Table No. 1: WHO criteria for BMI standard levels

Category (Groups)	BMI(Kg/m^2)
Underweight	< 18.4 Kg/m^2
Normal	18.5- 24.9 Kg/m^2
Overweight	25-29.9 Kg/m^2
Obese	>30 Kg/m^2

All the subjects were tested for their bone mineral densities (BMD) & according to WHO, T score of the patient indicating whether the person is normal or osteoporotic (table-2) showed t score criteria.[1,12]

Table No. 2: WHO definition of osteoporosis based on BMD

Classifi-cation	BMD	T-score
Normal	Within ±1 SD of the mean level for a young-adult reference population	T-score equal to −1.0 and above
Osteopor osis	-2.5 SD or above from the mean of a young to adult population	T-score equal to less than −2.5

Data was analyzed by using SPSS version 22.0. The statistical analysis was done wherein the p-value of < 0.05 considered as significant.

This study was approved by Ethical Review Committee of Karachi Medical and Dental College.

400 subjects were registered in the study including 320 (80%) females in which 120 (30%) were positive i.e. Osteoporotic. There were 80 (20%) male participants in which only 24 (6%) were positive. (Table-3).

Table No. 3: Frequency of Osteoporosis In Participants

Gender	Osteoporosis n (%)	Non osteoporosis n (%)	Total n (%)
Male	24 (6%)	56 (14%)	80 (20%)
Female	120 (30%)	200 (50%)	320 (80%)
Total n (%)	144 (36%)	256 (64%)	400

Out of total 400 participants, the risk factors of osteoporosis were, low physical activity (57%), lack of milk intake (52.5%) and intake of caffeine (97%) were present in more than 50% participants. Our study results showed 55% females undergone menopause in which 19.4% have early menopause leading to osteoporosis. The risk factors observed are shown in table-4.

Table No. 4: Risk Factors of Osteoporosis

Risk factors of osteoporosis	Risk factor present n (%)
Low physical activity	230 (57.5%)
Lack of milk and dairy products	210 (52.5%)
Steroids	20 (5%)
Caffeine	388 (97%)
Menopause	76 (55.5%)
Early menopause	62 (19.4%)
Obesity	180 (45%)

Comparison of risk factors of osteoporosis among males and females are shown in Table-5.

Table No.5: Gender Based Comparison of Risk Factors of Osteoporosis

Risk factors of osteoporosis	Males (n= 80) %	Females (n=320) %	P-value
Exercise			0.04
Mild	21 (26.2%)	150 (46.8%)	
Very often	19 (23.7%)	50 (15.6%)	
Infrequent	30 (37.5%)	80 (25%)	
Regularly	10 (12.5%)	40 (12.5%)	
Exposure to sunlight	75 (93.7%)	269 (84%)	0.06
History of fracture	05 (6.2%)	30 (9.3%)	0.04
Milk intake			0.07
Daily	8 (10%)	25 (7.8%)	
Weekly	28 (35%)	28 (8.7%)	
Rarely	4 (5%)	97 (30.3%)	
No	40 (50%)	170 (53.1%)	
History of steroid Present	4 (5%)	16 (5%)	0.05
Obesity	20 (25%)	160 (50%)	0.03

DISCUSSION

In this study only 25 % participants were found engaged in regular physical activity while the remaining having sedentary life style and this behavior of participants had significantly associated with osteoporosis. Study results shows that out of total females (n= 320) fifty percent (50%) are obese as compare to male participants and showed significant ($p<0.03$) gender difference and their comparison of exposure to sun light (which is a source of vitamin D) had shown statistically non-significant ($p>0.06$) difference. Milk contains Calcium which is an important factor for strong bones. Less Calcium intake is a well-known risk factor due to lack of milk intake in their diets.

This study included more females participants due their high chances of the disease as the risk for Osteoporosis is 2–3 times more among women and this risk increases with age too.[7,12]

Many reasons are there for higher prevalence in females like low bone mass and low level of estrogen hormone.[13,14]. These hip fractures are common in females but morbidity and mortality is found associated with males.[15] One of the important findings were described in another study that the association between low calcium intake (<600 mg/day) and osteoporosis similar to our study results.[16]

According to one study among postmenopausal women, burden of osteopenia and osteoporosis is very large and mainly related to modifiable risk factors[17, 18], our study also focused on contribution of modifiable osteoporotic risk factors. Osteoporosis is also related to mild trauma fracture or fragility fractures.[19]Our study results show significant association of obesity with osteoporosis. Physical activity and exercise improves strength and prevents the fragility of bones or fragility fractures in elderly people. The authorities recommend daily 30 minutes physical exercise.[20,21] Steroids are used in the treatment of inflammatory and autoimmune diseases. Glucocorticoids are most common causes of secondary osteoporosis.[22] Vitamin D and calcium containing diet reduce the risk of this condition but the study participants did not show taking such rich diet.[23,24]

CONCLUSION

The study concluded that the frequency of osteoporosis more in females as compare to males. Osteoporosis is a non-communicable disease that is leading cause of mortality and morbidity. Public awareness programs regarding prevention, diagnosis and management of osteoporosis and fragility fractures should be started in society on priority bases. The morbidity of osteoporosis can be reduced by giving education about modifiable risk factors like exercise, obesity and history of taking steroids.

Recommendations: Promotion of life style modification strategies and implementing food fortification policy (vitamin-D). 2) Awareness campaigns about physical activity.3) DXA scanning screening programs in society. 4) At national level, it is included in the national action plan for the prevention of non-communicable diseases.

Author's Contribution:

Concept & Design of Study:	Farhat Jafri, Nazia Hakeem
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Cosman F, de Beur SJ, LeBoff MS, Lewiecki EM, Tanner B, Randall S, Lindsay R. Clinician's guide to prevention and treatment of osteoporosis. Osteoporosis Int 2014;25(10):2359-81.
2. Pouresmaeili F, Kamalidehghan B, Kamarehei M, Goh YM. A comprehensive overview on osteoporosis and its risk factors. Ther Clin Risk Manag 2018;14:2029–2049.

3. Rossi Muntagner Mara Lia, copes Martinez Rafaclia, Ostodal. Factors related with osteoporosis treatment in postmenopausal women. Medicine (Baltimore) 2018;97(28): e11524.
4. Bijelic R, Miliceri S, Balaban J. Risk Factors for Osteoporosis in Postmenopausal Women Med Arch 2017;71(1):25–28.
5. Pisani P. Major osteoporotic fragility fractures: Risk factor updates and societal impact World J Orthop 2016;7(3):171-181.
6. Iwamoto J. Prevention and Treatment of Corticosteroid-Induced Osteoporosis 2005;46(4): 456–46.
7. Sayed SA, Khaliq A, Mahmood AE. Valuating the risk of osteoporosis through bone mass density J Ayub Med Coll Abbottabad 2016;28(4):730-733.
8. Naz MS, Ozgoli G, Aghdashi MA, Salmani F. Prevalence and risk factors of osteoporosis in women referring to the bone densitometry academic center in Urmia, Iran. Global J Health Sci 2016;8(7):135.
9. Hernlund E, Svedbom A, Ivergård M, et al. Osteoporosis in the European Union: medical management, epidemiology and economic burden. A report prepared in collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA) Arch Osteoporos 2013;8:136.
10. Horikawa K, Kasai Y, Yamakawa T, Sudo A, Uchida A. Department of Orthopaedic Surgery, Faculty of Medicine, Mie University, Japan J Orthopaedic Surg 2006;14(1):9-12.
11. World Health Organization. Obesity and Overweight (Fact Sheet).2015 Geneva. Available at: http://www.who. int/mediacenter/factsheets/ fs311/en/index.html (last accessed on April 12, 2015.
12. Fatima K, Siddiqui ST, Jafri F, Zubairy MA, Azhar S. Proportion of osteopenia and osteoporosis in female outpatients of ASH,Civil and JPMC. Ann Abbasi Shaheed Hosp Karachi and KMDC Coll 2006;11 (1):884-890
13. Bliuc D, Alarkawi D, Nguyen TV, Eisman JA, Center JR. Risk of subsequent fractures and mortality in elderly women and men with fragility fractures with and without osteoporotic bone density: the Dubbo Osteoporosis Epidemiology Study. J Bone Miner Res 2015;30(4):637–46.
14. Guggenbuhl P. Osteoporosis in males and females: is there really a difference? Joint Bone Spine 2009; 76: 595-601.
15. Vann M. Why osteoporosis is more common in women. (Online) 2011 Last updated May 8, 2011. (Cited 2012 July 21). Available from URL: http://www.everydayhealth.com/osteoporosis/osteo porosisand-gender.aspx.
16. Nagi D. Frequency of osteoporosis in an ambulatory setting in Lahore using quantitative calcaneal ultrasound. JPMA 2013;63:965.
17. Hyassat D. Prevalence and Risk Factors of Osteoporosis Among Jordanian Postmenopausal Women Attending the National Center for Diabetes, Endocrinology and Genetics in Jordan Biores Open Access 2017;6(1):85–93.
18. Abdul Khaliq S, Saad M, et al. Evaluation of risk factors in progression of osteoporosis among postmenopausal women in Karachi, Pakistan. JUMDC 2017;8.
19. Kassi M, et al. Determining the risk factors and prevalence of osteoporosis using quantitative ultrasonography in Pakistani adult women. Singapore Med J 2009;50(1):20.
20. Mamji F, Hasan J, Sabri S. Risk factors for osteoporosis in post-menopausal women with hip fractures. J Surg Pak 2010;15:82-86.
21. Carter ND, Khan KM, McKay HA, Petit MA, Waterman C, Heinonen A, et al. Community-based exercise program reduces risk factors for falls in 65-to 75-year-old omen with osteoporosis: randomized controlled trial. CMAJ 2002;167(9): 997–1004.
22. Pate RR, Pratt M, Blair SN, Haskell WL, Macera CA, Bouchard C, et al. Physical activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. JAMA 1995;273(5): 402–7.
23. Sewerynek E, Stuss M. Steroid-induced Osteoporosis. Aging Health 2012;8(5):471-477.
24. Heaney RP. Calcium, dairy products and osteoporosis. J Am Coll Nutr 2000;19(2 Suppl): S83–99. 1.