RISK FACTORS FOR OSTEOPOROSIS IN POST-MENOPAUSAL WOMEN WITH HIP FRACTURES

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ABSTRACT

Objective — *To identify modifiable risk factors in post-menopausal women who underwent hip fracture surgery due to osteoporotic hip fractures.*

Study design — *Cross sectional study.*

Place & Duration of study — *Mamji Hospital Karachi, from January 2008 – December 2009.*

Methodology — *During the study period all post-menopausal women diagnosed as having hip fractures and underwent hip fractures surgery were evaluated for presence of risk factors for osteoporosis using a questionnaire.*

Results — *One hundred and three women were included in the study. Mean age was 64.69 years and average duration of menopause was 9.92 years. The main significant risk factors found were early menopause, longer duration of menopause, low BMI, poor socioeconomic conditions, multiparity, smoking, illiteracy, lack of calcium supplements, injudicious use of steroids and poor visual acuity.*

Conclusions — *Advancing age, longer duration of menopause, multi parity, low BMI, poor socioeconomic conditions were found to be significant risk factors in women presenting with hip factures.*

Key words — *Hip fractures, Risk factors, Osteoporosis.*

INTRODUCTION:

Pakistan has a rapidly growing population with the percentage of elderly steadily increasing. Osteoporosis is therefore a significant public health problem particularly in women.[1,2,3] Osteoporosis is a skeletal disorder characterized by reduction in amount of bone per unit volume and micro architectural deterioration of bone tissue, increasing bone fragility and increasing fracture risk.[4,5] The disease is common in post menopausal women. Osteoporosis and related hip fractures are a major health problem. Fractures are associated with increased morbidity and mortality and impose a considerable financial strain on the community.[6] There is no clear data on the number of osteoporotic hip fractures per year in Pakistan besides, there is lack of information on epidemiology and demographics of hip fractures.[7,8] Despite the enormity of this disease osteoporosis is still not recognized as a major health problem. Diagnostic tools are not always available or utilized. Equipment is usually available in cities only.

Osteoporosis is a major cause of fractures in elderly, resulting in pain, disability, costly rehabilitation, poor quality of life and premature death. Developing countries continue to be ill equipped to handle burden of the disease together with poor literacy rates and lack of awareness on the risk factors and symptoms

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result in poor outcomes.[9] Several modifiable and non-modifiable risk factors of osteoporosis have been identified. A number of factors can increase the likelihood of developing osteoporosis some can be changed (modifiable) like low calcium intake, tobacco use, eating disorders, sedentary life style etc. However factors like female sex, Asian or Caucasian race, advancing age, menopause before age 45 years, family history of osteoporosis, a low body mass index, prolong amenorrhea unrelated to menopause, multiparity, prolonged lactation, certain medical disorders like celiac disease, hyperparathyroidism, prolong treatment with thyroid hormones cannot be changed.[5,10,11]

A large proportion of young Pakistani women are at risk of developing osteoporosis in the future, they can be benefited if modifiable risks are found and can be changed. The aim of the study was to identify modifiable risk factors in post menopausal women who underwent hip fracture surgery due to osteoporotic hip fractures.

METHODOLOGY:

This descriptive cross sectional study was conducted from January 2008 till December 2009 at Mamji Hospital Karachi. One hundred and three post menopausal women between 45 years to 80 years of age who underwent surgery for hip fractures, were included in the study. Post menopausal women reporting to emergency room with history of fall underwent x-ray evaluation for intertrochanteric and femoral neck fractures (hip fractures). They also underwent DHS (dynamic hip screw) surgery for intertrochanteric fractures and hemiarthroplasty (Austin Moore prosthesis) for neck of femur fractures.

The hospital stay was between 5 – 10 days in majority of the cases. During their hospital stay these women were evaluated for the presence of risk factors for osteoporosis which resulted in fracture of hip, using a pre-designed questionnaire. These women never took any hormone replacement therapy. Patients with organic diseases like hypertension, diabetes mellitus, renal failure, chronic diseases like tuberculosis, autoimmune disorders, thyroid diseases and associated parathyroid disorders were excluded from the study.

The questionnaire included the basic demographic data and associated risk factors information. It included age, ethnic status, medical, menstrual, gynaecological and obstetric history including history of smoking, medication use, steroids usage, homeopathic medicines as homeopathic medicines sold in Pakistan often contain steroids, monthly income, occupation, previous history of fractures occurring from trivial/minor injuries, history of fractures and osteoporosis in family was obtained. Fractures occurring from accidents were excluded.

Use of calcium and vitamin D supplement and its duration was also recorded. Type of clothing indicating sunlight exposure and subsequent vitamin D deficiency was also noted. Height in cm and weight in kg recorded and BMI was calculated as weight divided by height (kg/m²) using computer tables. Visual impairment requiring need for glasses with previous cataract surgery was also recorded. Data was entered in data editor of SPSS version 14. Age, BMI and risk factors mean, SD, frequency and percentages were calculated. Chi square test was used to assess the significance of risk factors. Statistical significance is taken at $p < 0.05$.

RESULTS

The basic socio-demographic characteristics of 103 post menopausal women undergoing surgery for hip fractures are shown in table I. The mean age was 64.69 ± 8.49 and age range was from 53 years to 88 years. Mean parity was 5.34, ranging from para 1 to para 9. Mean age at menopause was 50.68 ± 2.13 ranging from 45 years – 56 years and average duration of menopause was 9.92 years ± 6.12, indicating osteoporosis related hip fractures was significantly increased with number of pregnancies and duration of menopause.

Mean BMI was 24.67kg/m^2 ranging from 20–32kg/m^2. Twenty (19.4%) patients were Pushto speaking, 20 (19.4%) were Baloch, 14 (13.6%)

Table I: Socio-demographic Characteristics of Postmenopausal Women Undergoing Hip Fracture Surgery (n = 103)

	Mean ± SD	Range
Age (years)	64.69 ± 8.49	53 – 88
Parity (n)	5.34 ± 1.49	1 – 9
Age at Menopause (Y)	50.68 ± 2.13	45 – 56
Duration of Menopause (Y)	9.92 ± 6.12	
Weight (Kg)	57.43 ± 10.12	40 – 88
Height (cms)	152.22 ± 6.86	144 – 168
BMI (kg/m²)	24.67	20 – 32
Monthly Income (Rupees)		
< 5,000	5	4.9 %
5,000 – 10,000	53	51.5 %
10,000 – 20,000	22	21.4 %
> 20,000	23	22.3 %

Sindhi, 10 (9.7%) Punjabi and 39 (37.9%) Urdu speaking. Their monthly income varied; 53 (51.5%) belonged to a group earning between 5,000 – 10,000 rupees per month indicating fractures being more common in low socioeconomic group. Eighty-seven (84.5%) women were illiterate. Fifty-three (51.5%) had previous history of minor fractures after trivial trauma.

Family history of osteoporosis was found in 70 (68%) patients. Twenty-five (24.3%) gave history of steroid usage due to various reasons like asthma and skin diseases. History of homeopathic medicine usage was found in 38.8% patients. Only 16 patients (15.5%) gave history of usage of calcium supplements but irregularly. Eighty (77.7%) women breast feed their children. Most women were housewives living a sedentary life style. Visual impairment in the form of previous cataract Surgery and need for glasses was found in 72 (69.9%) of patients. Poor sun exposure related to wearing complete body covered clothing was found in 96 (93.2%) patients (Table-II).

Table II: Risk Factors For Osteoporosis In Women Undergoing Hip Fracture Surgery n = 103

	n	Percentage	p Value
Occupation			
Housewife:	95	90.5	< 0.005
Working Women	8	7.8	
Literacy			
Literate	16	15.5	< 0.005
Illiterate	87	84.5	
Smoking			
Yes	12	11.7	< 0.005
No	91	88.3	
Previous History of Fractures			
Yes	50	48.5	0.76
No	53	51.5	
Family History of Osteoporosis			
Yes	70	68	< 0.005
No	33	32	
Steroid Usage			
Yes	25	24.3	< 0.005
No	78	75.7	
Homeopathic Medicine Use			
Yes	40	38.8	0.023
No	63	61.2	
Use of Calcium Supplements			
Yes	16	15.5	< 0.005
No	87	84.5	
History of Lactation			
Yes	80	77.7	< 0.005
No	23	22.3	
Exercise			
Yes	30	29.1	< 0.005
No	73	70.9	
Visual Impairment			
Yes	72	69.9	< 0.005
No	31	30.09	

DISCUSSION:

Osteoporosis is a disease characterized by low bone mass, leading to enhance bone fragility in post menopausal women.[12] Many factors influence the risk of hip fracture in older women and that the assessment of risk factors and the measurement of bone density have complimentary value for the prediction of hip factures. In Pakistan life expectancy at birth has increased from 41 years in 1950 to 61.9 years in 1998 and is expected to be 72.4 years in 2023. The proportion of elderly and post menopausal women is on the rise. Studies indicate a high prevalence of risk factors associated with osteoporosis in the community.[10,14] In our study advancing age, longer duration of menopause, multi parity, low BMI, poor socioeconomic conditions were found to be significant risk factors in women presenting with hip factures. Similar associations were found in other studies where longer duration of menopause with estrogen deficiency, multi parity and low BMI were associated with hip factures.[5,15 -17]

Ethnic status does not seem to influence the risk of factures, as the area draining the patients mainly contain urdu speaking population. Studies in white women also suggest that skin color and ethnic status does not modify the development of hip factures in postmenopausal women.[15] Our study revealed that 90.5% women with hip factures were housewives living a sedentary life style. It is suggested that weight bearing type of exercise are known to increase bone mass and reduce the risk of fractures. This is comparable with other studies which also revealed lack of exercise as a cause of low bone mass and osteoporosis.[15,17]

Educational level of women also matters in understanding the preventive measures for osteoporosis and related hip factures. In our study

only 15.5% could read or write indicating illiteracy and lack of understanding the conditions related to hip fractures as important factors. Smoking is significantly associated with osteoporosis and quitting smoking diminishes the risk of hip factures.[15-18] Smoking among women was considered to be a taboo in Pakistani society. In our study 11.7% women were identified as smokers of cigarette, huqqa or tobacco chewers. This is comparable with 19.8% smoking prevalence in study at Quetta.[17] A smoking prevalence of 52% was found in low socioeconomic class in urban community in one study.[18]

Our study showed family history of osteoporosis and previous history of factures on trivial trauma as a significant risk factor in patients with hip factures. Women with family history of osteoporosis may have a genetic predisposition to osteoporosis with low bone mass. Thus an appropriate preventive behavior must be practiced by such women in order to prevent osteoporosis and related hip factures in future life.[19] Steroid usage is known risk factor for osteoporosis. Patients suffering from asthma, and skin disorders are often candidates who have been using steroids for longer duration of more than six months. In our study 75.7% patients gave history of usage of homeopathic medicines while 24.3% gave history of usage of steroids. Homeopathic medicines often contain steroids. Judicial use of steroids must be encouraged to avoid bone loss and patients must be told about the side effects of such medicines whenever they are prescribed.

Calcium supplements does not influence the development of osteoporosis related hip factures. However in our study only 15.5% patients used calcium supplements. Lack of calcium supplementation during pregnancy and lactation seems to be a factor, leading late in life to weak bones and osteoporosis related hip factures. Mean parity in our study was 5.34 which is comparable with other studies.[15,17,21] Multiparty is thus a very significant risk factor for osteoporosis hip factures. An effective family planning advise and calcium supplementation during pregnancy and lactation is therefore required for prevention of the condition.

Frequent eye testing, use of glasses and visual acuity testing prevent falls and trauma. In our study 69.9% women used glasses and had cataract surgery. Mean age of women with hip fractures in our study was 64 years. Indicating advancing age as a significant risk factor. Early onset menopause and longer duration of post menopausal period are significant risk factors too. After menopause ovaries secrete little or no estrogens. The mechanism by which lack of estrogen leads to increase bone loss in women is not well understood, but effect on osteoclasts function and changes in cytokines appear to contribute in pathogenesis of osteoporosis. Average age at menopause in our study was 50.68 years and duration of menopause was 9.92 years indicating a long estrogen deficient life as significant risk factor which is comparable with other studies.[16,22]

CONCLUSIONS:

The significant risk factors associated with osteoporotic hip factures in post menopausal women in our study were early menopause, longer duration of menopause, low BMI, poor socio economic condition, with poor nutrition , multiparty, smoking, lack of awareness and illiteracy and injudicious use of steroids.

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