Osteoporosis Presenting as Low Backache: An Entity not Uncommon to be Missed

Abstract

Introduction: Low backache (LBA) is highly prevalent in osteoporotic patients and affects their quality of life. Overall, osteoporosis incidence is greater in females than in males, and osteoporotic fractures typically occur with only modest or moderate trauma. **Aims and Objectives:** To evaluate osteoporosis as a cause of LBA in patients attending a neurosurgical outpatient department and to study various risk factors associated with it. **Materials and Methods:** The study entitled "Osteoporosis presenting as LBA: An entity not uncommon to be missed" was a 2-year hospital-based study conducted from August 2014 to July 2016 in a prospective manner and included 100 patients of osteoporosis with LBA. Analysis of records included their chief complaints, signs and symptoms, diagnostic investigations performed, treatment modalities they underwent, and further recommended management carried on them. **Results:** Out of total 100 patients evaluated, 33 (33%) were male and 67 (67%) were female; the age of patients was in the range of 35–70 years (mean 56.54 ± 91). The number of patients with a significant medical or surgical history was 31 (31%). The history of drug intake such as thyroxine, steroids, and antiepileptics was present in a total of 11 patients out of which 10 were female and one was male. Regarding lifestyle characteristics of studied patients, a total number of 72 (72%) were having sedentary habits with 15 (45.5%) males and 57 (85.1) females, the total number of moderate workers was 19 (27.3) males and 10 (14.9%) females, and heavy workers were 9 (9%) with 9 (27.3) males and 0 (0%) female. **Conclusion:** LBA is highly prevalent in osteoporotic patients especially in women. The incidence of osteoporosis and LBA increased with low body mass index, increasing age, and duration of menopause. The various risk factors for osteoporosis include smoking, history of medical diseases such as diabetes mellitus, history of hysterectomy, and history of antiepileptic, thyroxine, and steroid intake.

Keywords: *Backache, fracture, osteoporosis*

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Introduction

Osteoporosis is a skeletal disorder characterized by a reduction in bone mass with accompanying microarchitectural damage that increases bone fragility and the risk for fracture.[1] Low backache (LBA) is highly prevalent in osteoporotic patients and affects their quality of life.[2,3]

The incidence of fractures in the population is bimodal, with peaks in the young and very old. Overall, osteoporosis incidence is greater in females than in males and typically occurs with only modest or moderate trauma. Male to female ratio is 1:4.

Vertebral crush fractures are probably the most common type of osteoporotic fractures, the female-to-male ratio of vertebral fractures is estimated to be between 2:1 and 8:1 over a lifetime.[4,5] Vertebral fractures, although often asymptomatic when they occur, can also result in significant acute pain, requiring rest, and adequate analgesia.[6]

Materials and Methods

The study entitled "Osteoporosis presenting as low back ache: An entity not uncommon to be missed" was a hospital-based study and was conducted at the Department of Neurosurgery in Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar. Out of total 2612 patients of LBA who attended neurosurgery outpatient department (OPD), this series was based on total 100 patients of both genders with LBA and osteoporosis who were selected according to the selection criteria already set over a period of 2 years from August 2014 to July 2016 in a prospective manner. Analysis of records included their chief complaints, signs and symptoms, diagnostic investigations

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performed, treatment modalities they underwent, and further recommended management carried on them.

A complete history was elucidated with general physical examination; especially neurological examination was carried out on all these patients. Appropriate investigations such as X-ray dorsolumbar spine, dual-energy X-ray absorptiometry (DEXA) scan, magnetic resonance imaging, and computed tomography (CT) scan were done. In addition, routine investigations such as hemogram, liver function test, kidney function test, blood sugar, serum calcium levels, and serum parathormone levels parathyroid hormone were also carried out in these patients to reach at a provisional diagnosis of osteoporosis, and then, patients were subjected to appropriate medical therapy as per the protocol in the department. DEXA scan was carried out in all the patients who presented with LBA and the presence of osteoporosis was established in these patients.

Two criteria for osteoporosis diagnosis were (i) a history of fragility fracture (fracture at sites typically associated with low bone mineral density (BMD) in hip, pelvis, wrist, or spine) and (ii) DEXA applied to sites of biological relevance, including hip, spine, and forearm. If patient's BMD decreased more than 2.5 standard deviations compared with the general population in the same age group, then, he or she was defined as having osteoporosis.[7]

Exclusion criteria

Exclusion criteria included children and adolescents (age <18 years) and patients with radiologically documented lumbar pathology (lumbar disc disease, etc.,) or vertebral disease unrelated to osteoporosis.

Results

Out of total 100 patients evaluated, 33 (33%) were male and 67 (67%) were female. The age of the patients was in the range of 35–70 years (mean 56.54 ± 91).

Table 1: Significant history of study group

Presentation	Male, n (%)	Female, n (%)	Total, n (%)	P
Severe LBA	26 (78.8)	57 (85.1)	83 (83)	0.348
Mild LBA with radiculopathy	0	4 (6.0)	4 (4)	0.348
Severe LBA with radiculopathy	7 (21.2)	6 (9.0)	13 (13)	0.348
Past history	8 (24.2)	23 (34.3)	31 (31)	0.308
Drug history	1 (3.0)	10 (14.9)	11 (11)	0.075

LBA – Low backache

The total number of patients who presented with severe LBA was 83% and rest of them presented with other complaints such as radiculopathy. Out of these patients, there were 57 females (85.1%) and 26 males (78.8%). The number of patients with a significant medical or surgical history was 31 (31%). The history of drug intake such as thyroxine, steroids, and antiepileptics was present in a total of 11 patients out of which 10 were female and one was male [Table 1]. Regarding demographic features of studied patients, the total number of patients from urban areas was 73 (73%) and from rural areas was 27 (27%), out of which 21 males and 52 females were from urban areas and 12 males and 15 females from rural areas the number of males who smoked was 19 (57.6) and number of females who smoked was 6 (9%) with a total of 25 (25%). Regarding lifestyle characteristics of studied patients, a total number of 72 (72%) were having sedentary habits with 15 (45.5%) males and 57 (85.1) females; the total number of moderate workers was 19 (27.3) males and 10 (14.9%) females; and heavy workers were 9 (9%) with 9 (27.3) males and 0 (0%) female. Out of 67 females, the number of nonmenopausal women in the study was 15 (22.4%) and menopausal was 52 (77.6%). The age of menopause was 46.44 ± 3.27 (35, 50) and duration of menopause was 13.54 ± 6.38 (1, 27).

The anthropometric characteristics of the studied group included weight (in kg), height (in cm), and body mass index (BMI) in kg/m^2, which in total was in the range of 57.0 ± 4.4, 154.3 ± 3.3, and 24.0 ± 1.9, respectively.

Regarding radiological investigations of the studied patients, X-ray dorsolumbar (DL) spine was normal in 11 (33.33%) males and 17 (25.37%) females with a total of 28 (28%) and showed a radiological evidence of osteopenia or unrecognized fragility fracture in 22 (66.67%) males and 50 (74.63%) females with a total of 72.0%. BMD results in case of males was 0.97 ± 0.27 (0.48, 1.96) and in case of females 0.83 ± 0.21 (0.01, 1.60) with a total of 0.88 ± 0.24 (0.01, 1.96) as is summarized in Table 2.

With increase in age of studied subjects, the BMD showed increased osteoporotic bones from 2 (25%) to 25 (61%). The number of females with severe osteoporosis is 38 (56.7%) and number of males with severe osteoporosis was 10 (30.3%). The number of patients with sedentary lifestyle with abnormal BMD was 39 (54.2%). The number of patients with sedentary lifestyle with abnormal BMD was

Table 2: Radiological investigations of the studied patients

Radiography	Male, n (%)	Female, n (%)	Total, n (%)	P
X-rays dorsolumbar spine				
Normal	11 (33.33)	17 (25.37)	28 (28)	0.407
Osteopenia or fragility fracture	22 (66.67)	50 (74.63)	72 (72.0)	
Bone mass density (mean±SD)	0.97±0.27 (0.48-1.96)	0.83±0.21 (0.01-1.60)	0.88±0.24 (0.01-1.96)	0.006 (significant)

SD – Standard deviation

39 (54.2%). The number of patients presenting with severe LBA and severe LBA with radiculopathy was 41 (49.4%) and 5 (38.5%), respectively. The number of patients with positive medical or surgical history with osteoporosis was 15 (48.4%) as listed in Table 3.

Discussion

The study entitled "low backache and osteoporosis" was a prospective study, conducted on 100 patients randomly chosen who attended the OPD of Neurosurgery, SKIMS, Srinagar, from August 2014 to July 2016 with chief complaints of LBA. Among these 100 patients, there were

Table 3: Correlation of bone mineral density with studied parameters

Parameters	≤0.84 (abnormal), *n* (%)	≥0.84 (abnormal), *n* (%)	*P*
Age (years)			
31-40	2 (25)	6 (75.0)	0.0284
41-50	7 (41.2)	10 (58.8)	
51-60	14 (41.2)	20 (58.8)	
>60	7 (30.4)	16 (39.0)	
Age (years)			
<50	7 (30.4)	16 (69.6)	0.0559
>50	41 (53.2)	36 (46.8)	
Gender			
Male	10 (30.3)	23 (69.7)	0.0134
Female	38 (56.7)	29 (43.3)	
Overweight	15 (60.0)	10 (40.0)	
Residence			
Urban	34 (46.6)	39 (53.4)	0.6408
Rural	14 (51.9)	13 (48.1)	
Lifestyle			
Sedentary	39 (54.2)	33 (45.8)	0.0398
Moderate worker	7 (36.8)	12 (63.2)	
Heavy worker	2 (22.2)	7 (77.8)	
Chief complaint			
Severe LBA	41 (49.4)	42 (50.6)	0.519
Mild LBA with radiculopathy	2 (50.0)	2 (50.0)	
Severe LBA with radiculopathy	5 (38.5)	8 (61.5)	
Medical history			
Present	15 (48.4)	16 (51.6)	0.9588
Absent	33 (47.8)	36 (52.2)	
History of smoking			
Present	9 (36.0)	16 (64.0)	0.1676
Absent	39 (52.0)	36 (48.0)	
Drug history			
Present	7 (73.6)	4 (36.4)	0.2736
Absent	41 (46.1)	48 (53.9)	
Neurodeficit			
Present	5 (62.5)	3 (37.5)	0.3945
Absent	43 (46.7)	49 (53.3)	

LBA – Low backache

67 females and 33 males. The sex ratio of males and females was 1:2.03 which is comparable to the results obtained by Cooper and Kanis in 1992, i.e., 2:1 and 8:1.[4,5]

The number of patients who presented in our OPD with chief complaints of LBA only was 83 (83%) and was due to osteoporosis which is comparable to that reported by Bianchi ML *et al*. in 2005, i.e., 66% who conducted a study to evaluate the impact of osteoporosis on patients' quality of life.[8] Level of physical activity may modify the amout of bone loss in postmeopausal women as was reflected by Chow RK *et al*[9] in 1985. They also concluded that more sedentary lifestyle in urban areas was a contributory factor in postmenopausal urban women having higher percentage of osteoporosis compard to rural women.

Out of 100 subjects studied, 50 (50%) had a significant medical or surgical history and a positive drug history which includes history of hysterectomy, antiepileptics, and hypothyroidism (patients on thyroxine). This was also suggested by Barrett *et al*. 2008, who studied a large cohort of postmenopausal women who had sufficient power to identify 18 risk factors for osteoporosis.[10]

In our study of 100 subjects, 73 (73%) were having sedentary lifestyle and a smaller number was doing a moderate to heavy work (*P* = 0.00) as suggested by the study conducted by Chow RK *et al* in 1985, El-Desouki MI *et al* in 2007 on 429 men.[9,11]

Nineteen males out of 33 were chronic smokers and had high incidence of osteoporosis as has been also concluded by Lorentzon *et al*. 2006 in a study and found that smoking in young men is associated with lower BMD and reduced cortical thickness (*P* = 0.000).[12]

In our study of 100 patients, males were having BMI in the range of 20.23–21.06 and females 19.34–20.42. The results are lower for both sexes suggesting that BMI is inversely proportional to BMD of a subject. This is also suggested by Asomaning *et al*. 2006, who conducted a cross-sectional study among women aged 50–84 years from October 1998 to September 2000. It was concluded that women with low BMI are at increased risk of osteoporosis.[13]

The number of menopausal women, i.e., 52(77.6%) far exceeded nonmenopusal women - 15 (22.4%) in the study group which is comprrable to the study by Jang *et al*. in 2006 who found that prevalence of osteoporosis in postmenopausal women increased with age from 46.3 of those aged 45–64 to 68.7% for those aged 75 and over. Lean body mass appeared a significant contributor. Furthermore, the prevalence of osteoporosis with LBA increased with the increase in duration of menopause.[14]

X-rays DL spine of studied patients revealed osteopenia (fragility fracture) in 72 (72%) subjects and BMD results in case of females were on lower side, i.e., 0.01–1.60 than in males, which was 0.48–1.96 as has also

been suggested by Singer in 2006, who found that nearly half of all women and one-quarter of men >50 years of age will experience an osteoporosis-related fracture during their lifetime.[15]

DEXA scan is one of the major tools for detecting osteoporosis in postmenopausal women and older men at an early stage as has been also suggested by Singer in 2006 and Potochi in 2006, who found that the sensitivity, examination time, cost and radiation exposure to X-rays, CT, and DEXA differ greatly as has been concluded in our study also.[15,16]

Conclusion

LBA is highly prevalent in osteoporotic patients especially in women. The incidence of osteoporosis and LBA increased with low BMI, increasing age, and duration of menopause. The various risk factors for osteoporosis are smoking, history of medical diseases such as diabetes mellitus, history of hysterectomy, and history of antiepileptic, thyroxine, and steroid intake.

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Conflicts of interest

There are no conflicts of interest.

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