CLINICAL AND SOCIO-DEMOGRAPHIC PROFILE OF PATIENTS ON TREATMENT FOR OSTEOPOROSIS IN NAIROBI, KENYA

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ABSTRACT

Background: Osteoporosis is a chronic, progressive disease of multifactorial aetiology and one of the most common metabolic bone diseases worldwide. There is a paucity of data on osteoporosis in Africa as it's generally thought not to affect the non-Caucasian population. We sought to describe the population with osteoporosis in a Nairobi rheumatology clinic.

Objective: To evaluate the clinical characteristics of patients with osteoporosis seen at a rheumatology clinic in Nairobi.

Methods: Clinical, with emphasis on musculoskeletal manifestations, treatment and selected comorbidities in 56 patients diagnosed with osteoporosis were followed up and evaluated in the Nairobi Arthritis Clinic.

Results: The age distribution was 31- 95 years with majority being above the age of 60 years at 71.5%. Majority were female (89.3%). The main musculoskeletal manifestations were polyarthralgia (30.4%) followed by lower back pain (19.6%) and pathological fractures (12.5%). The types of osteoporosis were grouped as primary (9%), secondary (44.6%) and post-menopausal (46.4%). The most common clinical association being rheumatoid arthritis (39.3%) followed by steroids therapy (25%). Other comorbidities included osteoarthritis, fibromyalgia, systemic lupus erythromatosus and diabetes. Seven study participants had history of fracture with lumbar spine fractures leading at 42.8%. None of the study participants were smokers. The number of patients on calcium supplements was at 71.4% and bisphosphonates was low at 32%.

Conclusion: The findings of this study from age to comorbidities on osteoporosis are in keeping with literature. The number of patients on bisphosphonates was low which differed from Western literature. Persons at increased risk for osteoporosis in this set-up include post-menopausal women with debilitating chronic illness causing reduced mobilization over time and presenting with bone pains.These patients should be investigated for osteoporosis and effective treatment administered early.

Key words: Osteoporosis, Clinical profile, Nairobi, Kenya

INTRODUCTION

Osteoporosis is the most common metabolic bone disease affecting over 200 million people worldwide leading to physical, psychosocial, and economic consequences (1). The disease is characterized by decreased bone strength and is prevalent among postmenopausal women. It is often overlooked and undertreated because it's clinically silent unless it presents with a fracture. Osteoporosis is not regarded as a health priority in Kenya. There are no clinical guidelines regarding osteoporosis prevention and treatment**.** It has been associated in men and women with underlying conditions or major risk factors associated with bone demineralization. The World Health Organization (WHO) operationally defines osteoporosis as a Bone Mineral Density (BMD) that falls 2.5 Standard Deviations (SD) below the mean for young healthy adults of the same sex—also referred to as a *T-score* of –2.5. Postmenopausal women who fall at the lower end of the young normal range (a T-score ≤1.0) are defined as having low bone density and are also at increased risk of osteoporosis (2).

It's estimated that 75 million people in Europe, the United States, and Japan have osteoporosis (3). Two million fractures annually are attributed to osteoporosis in the United States of America (4). Osteoporosis afflicts persons of all races and ethnicities though non-Hispanic white women and Asian women have a higher risk for osteoporosis (5). Melton *et al* (5) reported that regardless of geographic location the prevalence of hip fractures is higher in white populations. Studies done in United States and South Africa have reported lower incidences of hip fractures in black persons than in age-matched white persons. A study by Cauley *et al* (6) reported the absolute fracture incidence across Bone Mineral Density (BMD) distribution was 30-40% higher in white than black women. This fracture risk was independent of BMD and other risk factors.

Despite ample sunshine, the Middle East and Africa register the highest rates of rickets worldwide. Low levels of vitamin D are prevalent throughout the region (7). Mortality rates post-hip fracture may be higher in this region than those reported from western populations. While such rates vary between 25-30% in western populations, they are 2-3 fold higher in populations from the Middle East and Africa region (8). There are extremely limited numbers of DXA machines available in this region. Kenya has 2 DEXA machines that serve a population of 40 million. Morocco has 0.6 DXA machines per 1 million people (7). Data from Egypt show that 53.9% of postmenopausal women have osteopenia while 28.4% have osteoporosis (9) whereas 21.9% of males aged 20-89 years have osteoporosis (7). A Kenyan study by Odawa *et al* (10) in a hospital based setting reported osteoporosis prevalence in black female population (over 50 years) at 24.5%. Odura *et al* (11) reported rates of osteopenia in pre and post-menopausal ladies to be 20.5% and 32% respectively. They also reported that Caucasians were most affected followed by Asian and Africans respectively (11).

MATERIALS AND METHODS

A retrospective evaluation of clinical characteristics of all patients with WHO definition of osteoporosis from January 2002 to January 2013 was undertaken. The study site is the Nairobi Arthritis Clinic and is situated in Nairobi, the capital city of Kenya and serves as a tertiary referral centre. It not only serves the two million inhabitants of Nairobi but also patients from all over Kenya and the greater East and Central African Region. Medical records of 56 patients with osteoporosis were recruited into the study. These patients were on regular follow-up at the Nairobi Arthritis Clinic. Demographic and clinical data (age, sex, comorbidities, clinical signs at diagnosis and medication used) were retrieved from the medical records of the patients. Diagnosis of osteoporosis was based on a *T-score* of –2.5 on bone mineral density scan. Diagnosis of comorbidities: (i) Rheumatoid arthritis, osteoarthritis, fibromyalgia and systemic lupus erythromatosus: were according to American College of Rheumatology. (ii) Diabetes, fractures and hypertension were as per the file diagnosis. *Statistical analysis:* Categorical variables were presented as number (%) and continuous variables presented as mean and standard deviation. Data was analysed using SPSS version 21.0.

RESULTS

A total of 56 patients with osteoporosis were identified after a record search of 9975 patients attending the Nairobi Rheumatology Clinic between January 2002 and January 2013. This was a female dominated population at 89.3% (Table 1). The mean age was 63.95 ± 11.2 years ranging from 31-95 years. Majority (49%) of the patients were post-menopausal and aged 60 years and above (Table 2). The two patients aged below 40 years were on steroids and had rheumatoid arthritis and SLE respectively. Figure 1 shows the main presenting complaints of the patients. The most common complaint was polyarthralgia followed by lower back pain and pathological fractures. Osteoporosis was grouped into primary (9%), secondary (44.6%) and post-menopausal (46.4%). Figure 2 shows the comorbidities with the most common being rheumatoid arthritis (39.3%).

Table 1
Demographic characteristics

Variable	Frequency (%)	
Mean age (SD)	66.6	(14.1)
Sex		
Female	50	(89.3)
Male	6	(10.7)

Table 2
Age distribution of study participants

Age group (years)	Frequency (%)
30-39	2 (3.6)
40-49	7 (12.5)
50-59	7 (12.5)
60-69	16 (28.6)
70-79	12 (21.4)
80-89	10 (17.9)
90-99	2 (3.6)

Figure 1
Musculoskeletal comorbidities of the study participants

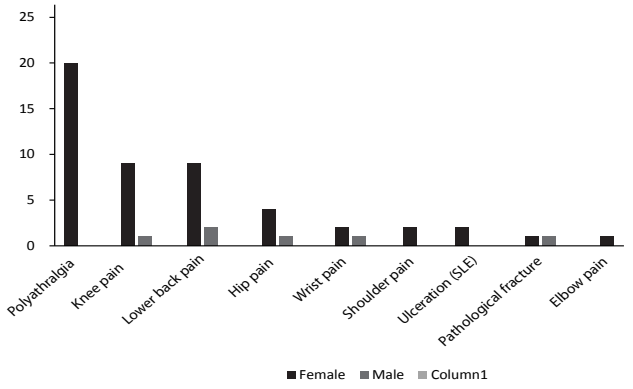

Figure 2
Comorbidities of the study participants

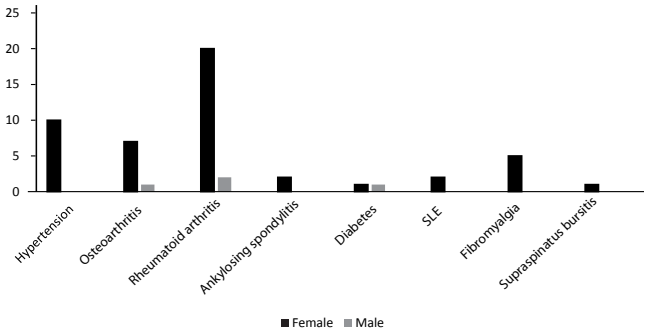

Table 3
Fracture distribution of study participants

Fracture type	No. (%)
Fractures	7 (12.5)
Categories	
Superior pubic Rami	1 (14.3)
Lumbar	3 (42.9)
Pathological (2 hip, 1 Superior pubic Rami)	3 (42.9)
Hip	2 (28.6)
Recurrent	1 (14.3)

Table 4
Medication used by study participants

Medication	No. (%)
Calcium	40 (71.4)
Use of VITSD3	3 (5.4)
Alendronate	8 (14.28)
Risendronate	5 (8.92)
Ibadronate	5 (8.92)

Other comorbidities included osteoarthritis, fibromyalgia, systemic lupus erythromatosus and diabetes. One in four patients had used steroids at some point of care. Seven study participants (12.5%) had history of fracture with lumbar leading at 42.8% (Table 3). None of the study participants were smokers. The number of patients on calcium supplements was at 71.4% and bisphosphonates was low at 32% (Table 4).

DISCUSSION

The key findings of this study are that osteoporosis in Nairobi, Kenya is influenced by age (post-menopausal), female gender and risk factors that either directly impact osteoporosis (steroids) or lead to immobilization of the patients. Odawa *et al* (4) in a hospital survey of post-menopausal women observed a prevalence of osteoporosis of 24.5%. Another Kenyan study done by Odura *et al* (11) also found that osteoporosis was more in post-menopausal ladies. Data from Egypt also shows that 53.9% of postmenopausal women have osteopenia while 28.4% have osteoporosis (9). Osteoporosis affects 1 in 4 women and more than 1 in 8 men over the age of 50 years in Canada (13, 14). Latin America studies have reported that the prevalence of vertebral osteopenia women above 50 years is between 45.5-49.7% with vertebral osteoporosis at 12.1-17.6%. They also have reported femoral neck osteopenia and osteoporosis at a prevalence of 46-57.2% and 7.9-22% respectively (14). The current estimated population in Kenya is 40 million of which 9% (3.5 million) is aged 50 years or over and 5% (1.9 million) is 70 years or over. It is estimated by 2015 that 17% (14 million) of the population will be 50 or over and 10% (7.8 million) will be 70 years or over, while the total population will increase to 80 million. With this increasing aging population the prevalence of osteoporosis will go up. Diagnosis is a challenge due to low index of suspicion and due to the limited number of DEXA machines in the country and Africa as a whole. Kenya has 2 DEXA machines that serve a population of 40 milion and the greater East Africa region. A study from Morocco reported low numbers of DEXA machines at 0.6 DEXA machines per 1 million people (7). There is also no local data to determine cut off for bone mineral density.

There is an increasing interest in males with osteoporosis with studies from Egypt reporting that 21.9% of males aged 20-89 years have osteoporosis (9). Some studies have found that men have a higher incidence of hip fractures than females (15, 16). Estimates have approximated that the residual lifetime risk of experiencing an osteoporotic fracture in men over the age of 50 years is up to 27%. This is much higher than the lifetime risk of developing prostate cancer of 11.3% (17, 18). The study had 6 non-smoking males, 2 had rheumatoid arthritis, one who was a known diabetic with recurrent fractures. The youngest patient with osteoporosis was a male aged 31 years, there was no established cause for the disease.

Majority of the study subjects presented with multiple joint pains (30.4%) which is not surprising as about

4 in 10 had rheumatoid arthritis. The most common fractures were lumbar at 3 followed by hip at 2. Overall fractures were more common in females with a female to male ratio was 6:1. The female predominance has been seen in other studies which have reported figures as high as 61% of osteoporotic all fractures occur in women (19). The male patient with the fractures was younger than the females and was diabetic with recurrent fractures. This was younger than the females who were aged more than 65 years. Other studies have also shown that nearly 75% of hip, spine and distal forearm fractures occur among patients aged 65 years or above (20). The use of steroids was common as 25% of the study participants had either past or current use. Prolonged use of corticosteroids is the most common cause of secondary osteoporosis. It is estimated that 30-50% of patients on long term corticosteroid therapy will experience fractures (20, 21). None of the patients were smokers. Smoking has been shown to lower bone density and increase the fracture risk and this risk increases with age (22, 23). The study also found that a low number of patients were on the appropriate treatment for osteoporosis. The number of patients on bisphosphonates was low (32%). Cost was the major hindrance as the lowest bisphosphonates costs approximately 100 USD per month which is beyond the reach of many.

CONCLUSIONS

The findings of this study from age to comorbidities on osteoporosis are in keeping with literature. The number of patients on anti-resorptive agents was surprisingly low which differed from Western literature. Attempts should be to offer cheaper anti-resorptive agents so that the affected can benefit from the drugs. Identifying and treating patients at risk of fracture, but who have not yet sustained a fracture, will substantially reduce the long term burden of osteoporosis.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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