

Osteoporosis among Bahraini Citizens: The First Report

Abstract

Background and Objective: Osteoporosis and its complications are increasing as the population is aging world over. Every country needs an initial assessment of prevalence to take appropriate steps in limiting the complications of osteoporosis. The objective of this study was to find the prevalence of osteoporosis in the Kingdom of Bahrain. **Methods:** We retrospectively reviewed dual-energy X-ray absorptiometry scans of patients who underwent scans for the diagnosis of osteoporosis between January 2016 and December 2017 at the University Medical Center, King Abdullah Medical City, Dr. Sulaiman AlHabib Hospital, Kingdom of Bahrain. The data were collected from the picture archiving and communication system for the study period. Patients' medical records were reviewed for the investigations and treatment ordered. The data were entered into the database and analyzed using SPSS Inc., version 19. **Results:** A total of 205 patients with an average age of 58.39 ± 12.12 years were included in the study. There were 185 (90.25%) females and 20 (9.75%) males. Seventy-nine (38.5%) were osteoporotic based on the T score of either at the hip (-2.61 ± 1.08) or the spine (-3.26 ± 0.78), with a mean age of 60.8 ± 13.1 years. Seventy-two (91.1%) of the osteoporotic patients were female and 42 (58.4%) were ≥ 65 years. Patients who were osteoporotic were significantly older with $P < 0.001$. There were 9 patients (4.39%) who had osteoporosis-related fractures. **Conclusions:** This study indicates that the prevalence of osteoporosis is common among Bahraini citizens. As the country's total population is < 1.2 million, it will not be difficult to target the ≥ 65 -year-old men and women in early diagnosis and treatment to prevent osteoporosis-related fractures.

Keywords: Bahrain, fragility fractures, osteopenia, osteoporosis

Introduction

Osteoporosis is an aging disease in which the quantity and quality of bone is drastically reduced and patients end up in having a fragility fractures with high mortality and morbidity. The prevalence of osteoporosis varies in a different ethnic population of the Arab-Gulf countries. Reports from Saudi Arabia show the prevalence to be around 33%^[1] and Kuwait around 20.2%.^[2] The majority of the untreated patients of osteoporosis end up in fragility fractures, which cause high morbidity and mortality.^[3,4] It is estimated that by 2025, in the USA, fragility fractures annually will cost \$25 billion.^[5] In Europe, the picture looks similar to the USA the annual cost of managing osteoporosis-related fractures expected to rise to €76.7 billion in 2050.^[6] In Saudi Arabia, a neighbor of the Kingdom of Bahrain, the incidence of fractures rose from 2.9/1000 of the population in Riyadh^[7] to 5.8/1000 in the Eastern Province.^[8]

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The Kingdom of Bahrain is a country of 1.2 million people; a review of the literature did not reveal a single article published in the English language related to osteoporosis and fragility fractures, and there is a total lack of any epidemiological data from the Kingdom of Bahrain.^[9] The objective of this study was to assess the prevalence of osteoporosis among Bahraini population by studying dual-energy X-ray absorptiometry (DXA) scans from a single hospital which will shed some light on the status of osteoporosis in the Kingdom of Bahrain.

Methods

We retrospectively reviewed DXA scans of patients who underwent scans for the diagnosis of osteoporosis between January 2016 and December 2017 at the University Medical Center, King Abdullah Medical City, Dr. Sulaiman AlHabib Hospital, Kingdom of Bahrain. All patients aged ≥ 55 years and a Bahraini Citizen were included in the analysis. After receiving the institutional review board approval, the data

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were collected from the GE Healthcare’s Centricity picture archiving and communication system (PACS)-IW PACS for the 2-year period. A diagnosis of osteoporosis was made based on low bone mineral density measured by DXA [Table 1]. Patients’ medical records were reviewed for the investigations and treatment ordered.

The software used for the diagnosis was the GE NHANES III software update, and the machine used was General Electric Lunar, Chicago, Illinois, USA. The data was entered in the database and analyzed using Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 21 for MacBook Pro, Chicago, Illinois.

Results

Two hundred and five patients had a DXA scan during the study period. The average age was 58.39 ± 12.12 years. There were 185 (90.25%) females and 20 (9.75%) males, and the average BMI was $23.2 \text{ kg/m}^2 \pm 4.13$. Seventy-nine (38.5%) were osteoporotic based on the T score of either at the hip (-2.61 ± 1.08) or the spine (-3.26 ± 0.78), with a mean age of 60.8 ± 13.1 years. Thirty-seven (18.48%) had a normal T score at the hip or spine, with a mean age of patients in this group being 53.9 ± 6.41 [Table 2]. Patients who were osteoporotic were significantly older with $P < 0.001$. Seventy out of 79 patients (88.6%) had osteoporosis at the lumbar spine and 38 (48%) had a T score of < -2.6 at the hips [Figure 1]. Table 3 gives the details of low bone mass among postmenopausal women. Investigations of Vitamin D level and calcium were performed in 98 (47.8%). The drug management of all osteoporosis patients could not be retrieved as of 2016 and 2017 had written prescriptions were used.

There were 9 (4.39%) had osteoporosis-related fractures, 5 (55.6%) neck of the femur, 3 (33.4%) vertebral column, and 1 (11.1%) fracture humerus and these are the patients, which were treated with antiresorptives, calcium, and Vitamin D.

Discussion

This study which is probably only reported study on the prevalence of osteoporosis from the Kingdom of Bahrain shows that the prevalence of osteoporosis is 38.5% and only 37 (18.48%) had a normal T score at the hip or spine, indicating that over 81% of the population over the age of 55 years has low bone mass. Compared to the other reports from the region, it is slightly higher. Recently, the prevalence of osteoporosis among Jordanian women was reported to be 13.5%,^[10] which is the lowest in the Middle Eastern countries.

As population ages, there is an upsurge in chronic diseases. The Global Burden of Disease Study of 2010 reported that the burden of noncommunicable diseases in the Arab world has increased and is expected to rise further.^[11]

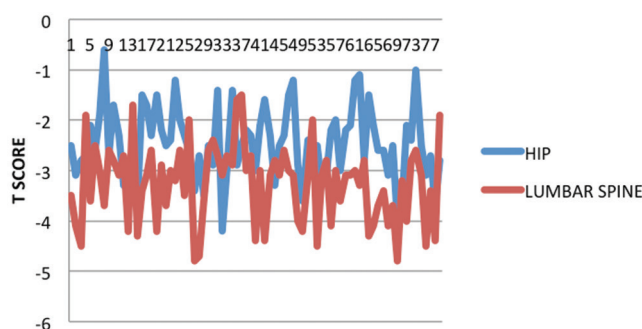


Figure 1: The T score at Hip and Lumbar spine

Table 1: World health organization’s definition of osteoporosis based on bone mineral density

Parameter	T-Score
Normal	≥ -1
Low bone mass (osteopenia)	-1.0 and -2.5
Osteoporosis	≤ -2.5
Severe or established osteoporosis	≤ -2.5 with a fracture

Table 2: Demographic data of patients with dual-energy X-ray absorptiometry scan

Parameter	Number of Patients
Total number of patients	205
Males	20 (9.75)
Females	185 (90.25)
Average BMI	23.2 kg/m ²
Osteoporosis	79 (38.5)
Osteopenia	97 (47.3)
Normal	29 (14.2)

BMI: Body mass index

Table 3: Data of postmenopausal women

Parameter	Number of Patients
Total number of patients	185
Osteoporotic (years)	72 (38.9)
≤ 64	30 (44.6)
≥ 65	42 (58.4)
Osteopenia (years)	86 (46.5)
≤ 64	60 (69.7)
≥ 65	26 (30.3)

Osteoporosis is classified as a chronic disease in which bone loss occurs silently and relentlessly till a fracture occurs. The morbidity and mortality of fragility fractures, particularly of hip fractures, is too high. The 1-year mortality in men after a fragility fracture was reported to be 26.8%.^[12] Recently Sadat-Ali *et al.*^[13] reported that the mortality after a fragility in the Saudi Arabian population was 30%.

The cost of management of osteoporosis and related complications is spiraling out of hand. In the US alone, the cost of treating osteoporosis-related fractures is expected

to be greater than \$25.3 billion by 2025.^[5] It was reported that direct and indirect costs of osteoporosis-related hip fractures yearly in Saudi Arabia reached Saudi riyals 2.359 billion and is projected that the lifetime costs of this single osteoporosis-related hip fracture by 2025 will reach SR35.0028 billion (\$9.34 billion).^[8] If the patients are screened earlier and treated appropriately as per the US database of 2011, it will cost \$2 billion, and if left untreated, once the fragility fractures are treated, the cost goes eight times to \$16 billion.^[14]

In recent years, health-care providers are trying to better ways to understand the epidemiology of postmenopausal osteoporosis and to limit the direct and the indirect costs of the disease. Epidemiological research is difficult for osteoporosis as majority of men and women with osteoporosis remain asymptomatic and the number of elderly population runs in millions. The Kingdom of Bahrain stands in a unique position from studying osteoporosis as ≥ 65 -year-old population is around 30,000.^[15] If these healthy people can be followed on a regular basis for the diagnosis, management, and incidence of fragility fractures for osteoporosis, much can be learned from this endeavor not only for the Kingdom of Bahrain for the whole region. The regular follow-up of the target population will help in the reduction of the fragility fractures which will limit economic cost and reduce morbidity and mortality. If early-organized steps are not taken to study patients aged ≥ 65 years for osteoporosis, it will be a lost opportunity.

Our study has limitations that it is retrospective in nature and from a single center, but it gives a definitive prevalence of osteoporosis among Bahraini population for the first time. This will help the health authorities to conduct more studies and to take necessary steps to early diagnose these patients and treat appropriately before a fragility fracture occurs.

Conclusions

Our study shows that osteoporosis is common among Bahraini citizens, planned epidemiological studies need to be done on a national basis which will shed light on the disease pattern in the country which will help in and early steps to target, diagnose, and treat osteoporosis patients will reduce the economic costs, morbidity, and mortality.

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Conflicts of interest

There are no conflicts of interest.

References

1. Sadat-Ali M, Al-Habdan IM, Al-Turki HA, Azam MQ. An epidemiological analysis of the incidence of osteoporosis and osteoporosis-related fractures among the Saudi Arabian population. *Ann Saudi Med* 2012;32:637-41.
2. Al-Shoumer KA, Nair V. Prevalence of low bone mass in postmenopausal Kuwaiti women residents in the largest province of Kuwait. *Arch Osteoporos* 2012;7:147-53.
3. Mariconda M, Costa GG, Cerbasi S, Recano P, Aitanti E, Gambacorta M, *et al.* The determinants of mortality and morbidity during the year following fracture of the hip: A prospective study. *Bone Joint J* 2015;97-B: 383-90.
4. Nazrun AS, Tzar MN, Mokhtar SA, Mohamed IN. A systematic review of the outcomes of osteoporotic fracture patients after hospital discharge: Morbidity, subsequent fractures, and mortality. *Ther Clin Risk Manag* 2014;10:937-48.
5. Burge R, Dawson-Hughes B, Solomon DH, Wong JB, King A, Tosteson A. Incidence and economic burden of osteoporosis-related fractures in the United States, 2005-2025. *J Bone Miner Res* 2007;22:465-75.
6. Kanis JA, Johnell O. Requirements for DXA for the management of osteoporosis in Europe. *Osteoporos Int* 2005;16:229-38.
7. Al-Nuaim AR, Kremli M, Al-Nuaim M, Sandkji A. Incidence of proximal femoral fractures in the urbanized community of Saudi Arabia. *Calcif Tissue Int* 1995;56:536-8.
8. Sadat-Ali M, Al-Dakheel DA, Azam MQ, Al-Bluwi MT, Al-Farhan MF, AlAmer HA, *et al.* Reassessment of osteoporosis-related femoral fractures and economic burden in Saudi Arabia. *Arch Osteoporos* 2015;10:37.
9. The Middle East and Africa Regional Audit. Epidemiology, Costs and Burden Osteoporosis in 2011. Available from: <http://www.iofbonehealth.org>. [Last accessed on 2019 Jun 03].
10. El-Heis MA, Al-Kamil EA, Kheirallah KA, Al-Shatnawi TN, Gharaibia M, Al-Mnayyis A. Factors associated with osteoporosis among a sample of Jordanian women referred for investigation for osteoporosis. *East Mediterr Health J* 2013;19:459-64.
11. Available from: https://www.researchgate.net/publication/259772867_Non-communicable_diseases_in_the_Arab_World. [Last accessed on 2019 Jun 03].
12. Schnell S, Friedman SM, Mendelson DA, Bingham KW, Kates SL. The 1-year mortality of patients treated in a hip fracture program for elders. *Geriatr Orthop Surg Rehabil* 2010;1:6-14.
13. Sadat-Ali M, Alfaraidy M, AlHawas A, Al-Othman AA, Al-Dakheel DA, Tayara BK. Morbidity and mortality after fragility hip fracture in a Saudi Arabian population: Report from a single center. *J Int Med Res* 2017;45:1175-80.
14. Blume SW, Curtis JR. Medical costs of osteoporosis in the elderly Medicare population. *Osteoporos Int* 2011;22:1835-44.
15. General Directorate of Statistics & Population Registry. Available from: <http://www.data.gov.bh>. [Last accessed on 2018 Sep].