

Original Research Article

Rates of Osteoporosis Screening Among Patients Attending Orthopedics Surgery Clinics, Riyadh, Saudi Arabia

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Abstract

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Introduction: Osteoporosis is a decreased bone density disease. It has become one of the leading causes of morbidity and mortality in the world wide. Our aim in this study is to determine the rate of osteoporosis screening among patients attending the orthopedic surgery clinics and to detect the rate of physicians who are following the recommendation of national osteoporosis foundations.

Methods: A retrospective cross-sectional study design was conducted in the orthopedic surgery clinics at King Saud university medical city in Riyadh SA. All male and females' patients 70 years or older in males and 65 years or older for females for a total of 951 patients attended the orthopedic surgery clinic from 16/05/2015-31/08/2016.

Results: A total number of 951 patients were included in our study. Of which 487 were screened for osteoporosis by dual-energy x-ray absorptiometry (DXA) SCAN (51.2%). Among them, 430 were females (64.66%) and 57 were males (19.93%). 113 were normal (23.20%). 172 had osteopenia (35.31%) and 190 had osteoporosis (39.01 %). The remaining 12 were not retrievable (2.5%). Results were also analyzed by physician practices to illustrate differences in physicians' rates of screening. Rates ranged from 25% to 72.5% with (standard deviation 12%).

Conclusions: Physicians need to be fully aware about the importance of applying the National Osteoporosis Foundation recommendations. Only half of the patients in this study had been screened, 40% of them had osteoporosis. Following the guidelines properly will help us detect early osteoporotic changes thus preventing the progression of the disease.

Key words: BMD testing, DXA scan, Osteopenia, Prevalence of osteoporosis.

INTRODUCTION

Osteoporosis, which literally means porous bone, is a disease in which the density and quality of bone are reduced. As bones become more porous and fragile (iofbonehealth.org/what-is-osteoporosis). It has become one of the most causes of morbidity and mortality in the world generally and in Saudi Arabia specifically.

Osteoporosis had significant impact on patient's life, it could limit mobility and restrict daily activities, many

studies showed osteoporosis complications, one of them was done to Reassess the osteoporosis related femoral fractures and economic burden in Saudi Arabia. It showed a total of 780 fractures was diagnosed in 681 patients whom their average hospital stay was 23.28 ± 13.08 days with a total cost of 68.77 million SR which is a significant amount of money (Sadat-Ali et al., 2015).

Another study aimed to determine hospital-based

prevalence of vertebral fractures in postmenopausal Saudi Arabian women by using a Chest x ray as a determinant for women aged 50 and above, results showed that 159 patients out of 785 had 198 vertebral fractures. 13.2% of them with vertebral fractures were on anti-resorptive therapy for osteoporosis (apps.who.int/iris/bitstream/10665/117779/1/15_6_2009_1420_1425.pdf).

Its effect is not only limited to the patient, in fact even the government will be financially affected. A retrospective study was done in Saudi Arabia to detect the Economic implications of osteoporosis-related femoral fractures in Saudi Arabian society. And showed that 23 male and 20 female patients with mean age of 72.11 years stayed at the hospital for 760 days. The cost for them reached up to 2.09 million SR which equals \$557,333.00 US with rate of 48,712 SR \$12,989.90 per patient (Bubshait and Sadat-Ali, 2007).

It is estimated that over 200 million people worldwide have osteoporosis (<https://www.ncbi.nlm.nih.gov/pubmed/16455317>). An epidemiological analysis conducted in Saudi Arabia showing that 34% of all women, and 30.7% of all men all of which are medically free, between 50-79 years of age have osteoporosis in Saudi Arabia (Sadat-Ali et al., 2012).

Stressing on the point that osteoporosis has many serious complications mainly depression and fractures that could result in a lifetime limited mobility. Osteoporosis associated with increase of the length of hospitals stay which adds to the financial burden to the patients nevertheless higher rates of infection associated with long hospital stay (healthline.com/health/osteoporosis-complications#Complications4).

Bone densitometry, also called dual-energy x-ray absorptiometry or DXA, was used to screen our patients. It uses a very small dose of ionizing radiation to produce pictures of the inside of the body to measure bone loss in fact it is the most accurate method to diagnose osteoporosis (radiologyinfo.org/en/info.cfm?pg=dexa).

In conclusion, screening of osteoporosis is very important in order to discover osteoporosis in its early stages; preventing its progression and associated complications. In this study, we are looking to discover and to determine the rate of osteoporosis screening among patients attending the orthopedic surgery clinics in our hospital in addition, to detect the rate of physicians who screened for osteoporosis to get an idea about their adherence to the guidelines.

MATERIALS AND METHODS

25095 resisted visits to the orthopedic surgery clinics from 16/5/2015 which mark our launch of the Electronic System for Integrated Health Information (e-SiHi) that includes a complete, comprehensive and searchable patient registry - till 31/8/2016, among which there was 13147 repeated visits which were excluded. We ended up with unique

11948 visits that has no repetition. The orthopedic surgery clinics in King Saud university medical city has 19 full- and part-time physicians organized into 6 different orthopedic subspecialties (each physician practice has 1 registrar and 2-3 residents) who care for a total of approximately 9000-13000 patients a year. Inclusion/exclusion criteria were applied including all males 70 years or older and all females 65 and older. A total number of 951 patients were enrolled in a retrospective cross-sectional chart audit. Each of the patients' medical records underwent a comprehensive and complete review of all radiological tests has been performed looking for BMD testing "bone mineral density" by DXA scan that has been done to the patients using a website program for our hospital PAC system "Centricity".

Dual-energy x-ray absorptiometry is the most useful and reliable bone density test. It is a specialized kind of x-ray. DXA provides precise measurements of bone density at important bone sites (such as the spine, hip, and forearm) with minimal radiation.

Osteoporosis were defined as (T-score of -2.5 or less) Low bone mass (osteopenia) were defined as (T-score between -1.1 and -2.4) Normal bone density were defined as (T-score between +1 and -1) (uptodate.com/contents/bone-density-testing-beyond-the-basics#H9).

Data were entered into Microsoft Excel spreadsheets and subsequently calculated using Statistical Package for the Social Sciences (SPSS) version 19 software (SPSS Inc., Chicago, IL, USA) which was used for statistical analysis. The project was reviewed and approved by the Institutional review board (IRB)/Ethics committee at King Saud University, Riyadh SA.

RESULTS

From the 11948 patients we got 951 patients older than 65 Years. 665 of them were females (69.93%) and 286 of them were males (30.07%), their ages varied from 65 - 101 with an average age of 73.

A total of 487 patients (51.21% of all patients had received BMD testing). Unluckily, 12 BMD reports ~2.5% of all patients were not retrievable from the records, leaving us with a total of 475 patients with available BMD T-scores (Table 1). The National Osteoporosis Foundation recommends bone density testing for all women aged 65 years or older and all men aged 70 years or older. It also recommends bone density testing for postmenopausal women younger than 65 years and men aged 50 to 69 years if there is concern about osteoporosis on the basis of their risk factor profile (National Osteoporosis Foundation, 2008). According to the World Health Organization, there is indirect evidence of the effectiveness of screening for osteoporosis in women aged 65 years or older, but no direct scientific evidence supports widespread screening for osteoporosis using BMD testing. Moreover, widespread screening programs may not be

Table 1. Bone mineral density results using DXA scan N :475

Patients	Normal	Osteopenia	Osteoporosis
Number of patients	113	172	190
Percentage of patients tested	23.2%	35.32%	39.01%

Table 2. Patients screened in each age group

Age groups	No. of Patients	No. screened	%	Normal	Osteopenia	Osteoporosis
65-69	302	204	67.55 %	58	78	63
70-74	304	135	44.41 %	26	41	64
75-79	217	101	46.54 %	20	37	43
80-84	86	29	33.72 %	4	10	14
85-89	28	13	46.43 %	5	3	4
>90	14	5	35.71 %	0	3	2
totals	951	487	51.21 %	113	172	190

Table 3. Comparison between males and females

Patients	Males	Female	Total
No. of Patients	286	665	951
No. of Patients screened	57	430	487
% of Patients screened	19.93%	64.66 %	51.21%
Normal	18 (31.58%)	95 (22.1%)	113 (23.2%)
osteopenia	23 (40.35%)	149 (34.65%)	172 (35.32%)
Osteoporosis	14 (24.56%)	176 (40.93%)	190 (39%)

feasible or cost-effective in many countries (Health Organization Regional Office for Europe (Health Evidence Network) (2006). Osteoporosis was defined as (T-score of -2.5 or less) Low bone mass (osteopenia) was defined as (T-score between -1.1 and -2.4) Normal bone density was defined as (T-score between +1 and -1) (uptodate.com/contents/bone-density-testing-beyond-the-basics#H9) T-scores are used to compare patients' bone density with the average bone density of young healthy adults of the same sex and are based on standard

deviations above or below the mean BMD for the reference population.

To determine the rates of screening among different patient groups, results were analyzed according to age group (Table 2). Highest rates of BMD testing found to be in first age group between 65 and 69 years of age, constituting 67.55% of the total 302 patients in this age group the differences were statistically significant (P = 0.035). 5 out of 14 patients older than 90 received BMD testing (35.7%). Attributed to the small number of

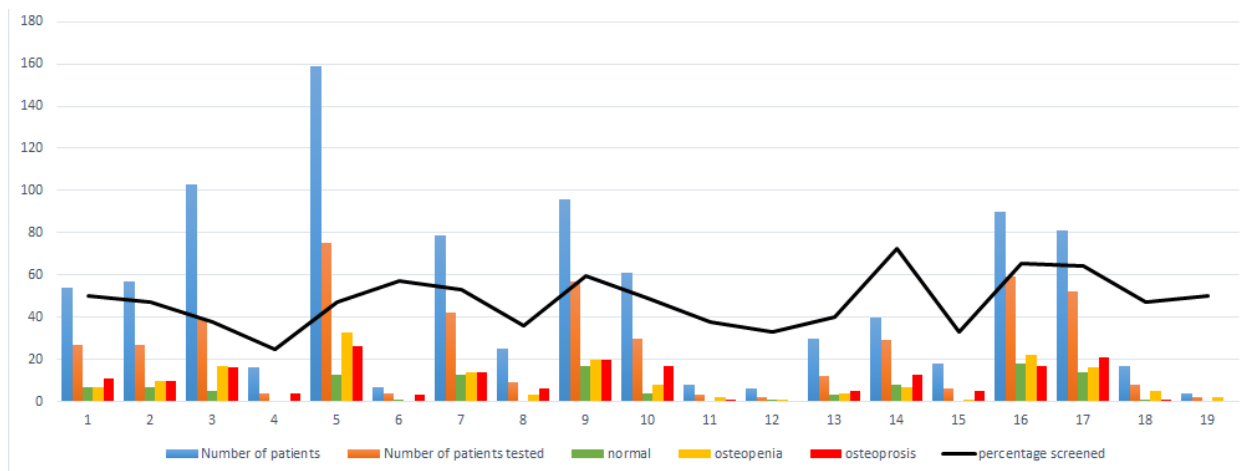


Figure 1. Physicians' rates of screening

patients in this age group.

Results were also analyzed by physician practices to illustrate differences in physicians' rates of screening (Figure 1). On average, 51.2% of patients older than 65 years had been screened; rates ranged from 25% to 72.5% (standard deviation 12%). Screening rates were not related to the size of the eligible patient population in each practice.

There were clear discrepancies between males and females in regard to osteoporosis screening (Table 3). Rates of BMD testing found to be much higher in females. Precisely 64.66% of them had BMD testing compared to only 19.93% in males. Of the 430 screened females, 40.93% were found to have osteoporosis compared to 24.56% in males who were tested (p value 0.052). Nevertheless 34.65% of them had osteopenia and the remaining 22.1% showed normal results. Out of the 57 males tested 40.35% was found to be osteopenic, 31.58% of them had normal BMD results.

DISCUSSION

As shown above most of the male patients were not screened at the age of 70 unlike females, more than half of them had been screened that could be referred to the focusing on the menopause age and its effects on causing osteoporosis unlikely in men where they don't experience that. Actually, the results showed that the number of females having osteoporosis is way larger than males and that could be one of the reasons too. A study was conducted to detect if family physicians are following the osteoporosis screening in men and showed that 20% of 565 male patients older than 65 years had been screened which is almost the same compared to our study 19.93% (Cheng and Green, 2008).

Physicians should be aware more about the importance of osteoporosis screening at certain age group either in

males or females and follow the recommendations of National Osteoporosis Foundation. Results showed remarkable variations between different physician practices regarding osteoporosis screening recommendations, but that need to improve since the complications of osteoporosis could very much affect patient life quality. Complications like femoral and vertebral fractures are common and dangerous not to mention the depression that will be associated with (Sadat-Ali et al., 2015; apps.who.int/iris/bitstream/10665/117779/1/15_6_2009_1420_1425.pdf; Bubshait and Sadat-Ali, 2007). Although most of the physicians are aware of most of these complications sequela they should be highly adhered to the recommendations to avoid them.

We understand that some of the patients make it difficult to the physician to screen either because refusing to perform screening or not showing routinely to the clinics. But that should encourage physicians to aware them of how much is it important especially if they are having some of the risk factors for osteoporosis. Those patients in specific should be screened or at least be aware of its importance.

Patients that was found to have osteopenia (35.32%) should not be left over untreated since they are at higher risk to develop osteoporosis with time, so physicians need to in light them about it and its course of progression as well with the associated complications and what could happen as a result of that. Starting the early process of management and care could prevent the patients from long term complication and the financial compromise that could happen as a result of that allowing the patients to have a better life quality.

CONCLUSION

The rapidly increasing incidence of osteoporosis and

osteopenia along with the high variability of applying the screening recommendations of National Osteoporosis Foundation between physician practices rise importance of establishing a local standardized screening programs throughout our kingdom. Applying such program would increase the detection rate of the disease in its early stages. e.g. osteopenia thus directing early treatment and preventive methods aiming to decrease the rate of full blown osteoporosis and its associated complications.

There was significant differences between males and females in means of osteoporosis screening. Results showed that 57 out of 286 males were screened at the age of 70 or above 19.93% compared to 430 out 665 females were screened at the age 65 or above 64.66%. Although higher rates of osteoporosis was found in female 40.93% compared to 24.56% in males.

This could be attributed females start with lower bone density than their male peers and they lose bone mass more quickly as they age, which leads to osteoporosis in some women. Between the ages of 20 and 80, the average white woman loses one-third of her hip bone density, compared to a bone density loss of only one-fourth in men. Not to mention the post-menopausal effect on the bones as estrogen levels drop and can lead to bone loss (National Osteoporosis Foundation, 2008).

Conflict of Interest

The authors declare no conflict of interest.

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