EVALUATION OF EPIDEMIOLOGICAL DATA OF THE PATIENTS UNDERGOING DXA: CROSS-SECTIONAL STUDY IN SUBURBS

DXA YAPILAN OLGULARIN EPİDEMİYOLOJİK VERİLERİNİN DEĞERLENDİRİLMESİ: BANLİYÖLERDE KESİTSEL ÇALIŞMA

Sevin Ayaz[1], Mehmet Ercüment Döğen[2] , Emine Bucak Özçelik[3]
[1]Department of Medical Imaging Techniques, Toros University, Vocational School; Department of Nuclear Medicine, Mersin City Hospital, Mersin,
[2]Department of Radiology, Mersin Women's and Children's Hospital, Mersin,
[3]Department of Radiology, Konyaaltı Public Health Center, Antalya, Turkey

This study was presented at 9th Turkish National Radiotechnology Congress, October 7–9, 2011 in İzmir, Turkey.

Öz

Amaç: Mersin ilinde banliyö bölgelerinde kemik mineral dansitometri (KMD) tetkiki yapılan olguların epidemiyolojik verilerini elde etmeyi ve değerlendirmeyi amaçladık. Gereç ve Yöntem: KMD tetkiki yapılan 370 olgudan elde edilen epidemiyolojik veriler oransal olarak değerlendirilmiştir. Veriler yüzde olarak ve n=n1/Toplam sayı olarak belirtilmiştir. Bulgular: Olguların yaş ortalaması 54.71 yıl (yaş aralığı, 6–82 yıl); kadın sayısı %97.6 (n=361/370); erkek sayısı %2.4 (n=9/370) olarak saptandı. Olguların çoğunluğu 40–60 yaş aralığında (%65.7, n=243/370) idi. İlkokul düzeyinde veya altında eğitim alanlar %78.9 (n=292/370), ortaokul mezunu olanlar %7.3 (n=27/370), lise ve üniversite mezunu olanlar %13.8 (n=51/370) oranında bulundu. Hastalarımızın ana yakınma nedeni kas-iskelet sistemi ağrısı idi (%47.6, n=176/370). KMD tetkikini düzenli aralıklarla yaptıranlar %20.8 (n=77/370) oranında bulunmuştur. Olgular arasında sigara kullanmayanlar %83 (n=307/370), düzenli sigara kullananlar %17 (n=63/370) oranında saptanmıştır. Olgular arasında hiç egzersiz yapmayanların veya düzensiz yapanların oranı %73 (n=270/370) idi. Tartışma: Çalışmamızda, eğitim düzeyinin artışı ile düzenli KMD tetkiki yaptırma oranının artabileceği öngörülmüştür. KMD tetkiki yapılacak hastalarda ölçüm değerlerini etkileyebilecek epidemiyolojik verilerin elde edilmesi, hasta eğitimi ve gelecekte yapılacak KMD tetkiklerinin planlanması açısından yarar sağlayacaktır.

Anahtar Kelimeler

Kemik Mineral Dansitesi; Epidemiyoloji; Osteoporoz

Abstract

Aim: We aimed to obtain and evaluate epidemiological data of the patients who underwent bone mineral densitometry (BMD) examination with dual x-ray absorptiometry (DXA) in suburbs of Mersin City. Material and Method: We evaluated the data obtained from a prepared questionnaire administered to 370 patients who underwent BMD examination. The data obtained were given in terms of percentages and as n=n1/whole population. Results: The mean age of the patients was 54.71 years (range, 6–82 years). The percentages and the numbers of females and males were 97.6% (n=361/370) and 2.4% (n=9/370), respectively. The majority of the patients were between 40–60 years of age (65.7%, n=243/370). The percentages and the numbers of patients who had education at or below primary school level were 78.9% (n=292/370). The percentages and the numbers of patients who graduated from secondary school and who had high school or an upper degree education were 7.3% (n=27/370) and 13.8% (n=51/370), respectively. The major complaint of our patients was musculoskeletal pain (47.6%, n=176/370). Only 20.8% (n=77/370) of the patients mentioned regular previous BMD measurements. The majority of patients (83%, n=307/370) gave no history of cigarette smoking, whereas 17% (n=63/370) of our patients were smoking regularly. 73% (n=270/370) of the patients did not perform regular exercise. Discussion: With a higher level of education, the patient's complicance in undergoing regular BMD measurements can increase. Obtaining epidemiological data of patients at the time of BMD measurements and evaluation of these data were considered useful and recommended for patient education and future planning of BMD measurements.

Keywords

Bone Mineral Density; Epidemiology; Osteoporosis

DOI: 10.4328/JCAM.4958 Received: 20.02.2017 Accepted: 06.03.2017 Printed: 01.04.2017 J Clin Anal Med 2017;8(suppl 2): 94-6
Corresponding Author: Sevin Ayaz, Department of Medical Imaging Techniques, Toros University, Vocational School, Yenişehir, 33140, Mersin, Turkey.
GSM: +905377639443 F.: +90 3243253301 E-Mail: sevinayaz@yahoo.com

Introduction

Decrease in bone density increases the risk of bone fracture. In adults, advanced age is accompanied by decreased bone density. Since bone density affects the fracture resistance of bone, bone mineral density (BMD) measurement is extremely important for determination of the fracture risk. Because, as a systemic bone disease, it leads to fractures, osteoporosis causes serious health problems and economic losses. It is estimated to be present in 10% of the world population [1]. BMD measurement methods such as dual x-ray absorptiometry (DXA), were developed for the diagnosis and follow-up of osteoporosis and for predicting the fracture risk [2]. With the aid of DXA, osteopenia and osteoporosis can accurately be diagnosed in geriatric and non-geriatric adult males [3]. DXA has also been defined as the best densitometric technique for the evaluation of BMD in postmenopausal women, for diagnosing osteopenia and osteoporosis, and for their follow-up [4]. Today, DXA is the reference method because of its acceptable accuracy, better sensitivity, repeatability, and reproducibility [4,5]. During BMD measurements with DXA there is minimal exposure to ionizing radiation and the measurements can be completed within minutes [4]. The patients' awareness of the importance of osteoporosis and BMD measurements with DXA can help prevent this worldwide health problem. In our study we aimed to obtain and evaluate epidemiological data of the patients who underwent DXA in suburbs of Mersin City.

Material and Method

In this cross-sectional study which was performed between May 2011 and December 2011 in accordance with the World Medical Association Declaration of Helsinki (revised in 2000, Edinburgh), we included 370 consecutive patients from suburbs of Mersin City who were to undergo BMD measurements with DXA. All the patients were informed about DXA procedures and gave their consent. The data were obtained through face-to-face interviews using a prepared questionnaire. The age, gender, complaints, education level, the intervals of BMD measurements (whether regular or not), smoking habits of the patients, and their frequency of exercise were recorded. The epidemiological data of these patients were given in terms of percentages and as n=n1/whole population.

Results

The mean age of the patients was 54.71 years (range, 6–82 years). The percentages and the numbers of females and males were 97.6% (n=361/370) and 2.4% (n=9/370), respectively. Of the whole study population, 1.9% (n=7/370) were between 6–14 years, 2.2% (n=8/370) were between 30–40 years, 31.1% (n=115/370) were between 40–50 years, 34.6% (n=128/370) were between 50–60 years, 19.5% (n=72/370) were between 60–70 years, and 10.8% (n=40/370) were between 70–82 years of age. The percentages and the numbers of the patients who had education at or below primary school level were 78.9% (n=292/370). The percentages and the numbers of the patients who graduated from secondary school and who had high school or an upper degree education were 7.3% (n=27/370) and 13.8% (n=51/370), respectively. The major complaint of our patients was musculoskeletal pain (47.6%, n=176/370). Only 20.8% (n=77/370) of the patients mentioned regular previous BMD measurements. The majority of the patients (83%, n=307/370) gave no history of cigarette smoking, whereas 17% (n=63/370) of our patients were smoking regularly. 73% (n=270/370) of the patients did not perform regular exercise. The main epidemiological data of the patients are given in Table 1.

Table 1. Main epidemiological data of the patients.

Epidemiological parameter	Percentage
Complaints/the reasons of referral for DXA	
Musculoskeletal pain	47.6%
Routine control	44%
Other complaints	8.4%
Smoking habit	
No smoking	83%
Regular smoking	17%
The intervals/regularity of BMD measurements	
First referral	46.2%
Not regular	33%
Regular (annual)	20.8%
The frequency of exercise	
Not regular/no exercise	73%
Regular (twice or more a week)	27%

Discussion

Today, the gold standard for the diagnosis of osteoporosis is DXA. Major risk factors related with decreased bone density are advanced age, lower body mass index, weight loss, decreased physical activity, prolonged use of corticosteroids, androgen suppression treatment in men, and history of fracture due to osteoporosis [6, 7]. Performing BMD measurements before starting treatments such as corticosteroid administration is important to predict the high risk of osteoporosis and to take the necessary measures [8].

Osteoporosis is a systemic disease characterized by low bone density and microarchitectural deterioration which leads to increased risk of bone fracture [1]. For this reason the main goals of osteoporosis treatment are to prevent or decrease bone loss, to increase bone mineral density and bone strength, and to prevent fracture formation [9]. An ideal anti-osteoporosis agent should serve the above-mentioned goals, be well-tolerated by the patients, and suitable for long-term use. Anti-osteoporotic effects of statins have been demonstrated after at least six months period of treatment [10]. Osteoporosis treatment is appropriate for patients with moderate to high risk of fracture; however in the low-risk group, the balance between the beneficial vs. adverse effects, and the costs of pharmacological prevention, should be taken into consideration [11]. In our study, which gathered the fundemental epidemiological data of the patients who were referred for BMD measurements, we detected that the majority (65.7%) of our patients were between 40–60 years of age. Musculoskeletal pain was the major complaint of our patients. We considered that their lifestyle without regular exercise was related to these complaints in most of these patients, because sedentary living lacking adequate physical activities leads to a decrease in bone mass [12]. Lifting light weights and isotonic exercises like brisk walking are

important in the prevention and treatment of osteoporosis [12–14]. In a study that evaluated the relationship between smoking and BMD using biochemical parameters such as calcitropic hormones, it was reported that smoking caused a decrease in BMD [15]. A considerable portion of our patients (17%) in our study were smoking regularly.

In a multicenter study, the educational status of the osteoporotic patients was found to have a great impact on their level of knowledge about osteoporosis [16]. The main goals of educating people about osteoporosis are to increase their awareness about this disease and to encourage them to take precautions such as performing regular exercise and maintaining anti-osteoporosis treatment. Most of the patients in our study were undereducated (78.9%), which was considered to be related to the low rates of regular exercise (27%) and regular BMD measurements (20.8%). In one study, significant differences were found between female patients from different places or regions with regard to their consciousness about osteoporosis, level of education, level of physical activities, dressing style, and smoking habits [16]. More studies such as ours from different regions of Turkey can be performed in order to investigate diversities in the epidemiological data of patients undergoing DXA. With the guidance of these data, it can be possible to increase the awareness of patients about ostoporosis and to provide access to preventive measures through the whole country.

Our cross-sectional study had some limitations. Firstly, the patients were not followed up, which could be useful to observe the changes in their attitudes to undergoing regular DXA measurements and exercising regularly. Secondly, detailed epidemiological parameters such as dietary habits and family history of fracture could not be obtained in our busy public hospital. Thirdly, we could not gather all of the necessary information for fracture risk assessment tool (FRAX®) [17], which could help assess the probability of major osteoporotic fractures in our region. However, we consider that our sample size was large enough to reflect the status of the people living in suburban areas of Mersin.

Conclusion

With a higher level of education, the patient's compliance in undergoing regular BMD measurements can increase. In each DXA unit of the country, obtaining epidemiological data of the patients at the time of BMD measurements via face-to-face interviews using prepared questionnaire, and evaluation of these data can be useful for patient education and future planning of BMD measurements. Aggregation of all these epidemiological data in a single national center can help develop more efficient health policies to prevent osteoporosis and its complications.

Acknowledgements

We wish to express our appreciation to all the staff for their contribution while this study was conducted between May 2011 and December 2011.

Competing interests

The authors declare that they have no competing interests.

References

1. Krejovic SM, Zivanovic A, Hasani B, Ille T, Glisic A. Effects of tibolone on bone mass in postmenopausal women. Turk J Rheumatol 2011;26:226–32.
2. Walker-Bone K, Dennison E, Cooper C. Epidemiology of osteoporosis. Rheum Dis Clin of North America 2001;27:1–18.
3. Ayaz S, Döğen ME. Bone mineral density measurements of adult males in Mersin: comparison of lumbar spine and femur. J Clin Anal Med 2017;8:19–22.
4. El Maghraoui A, Roux C. DXA scanning in clinical practice. Q J Med 2008;101:605–17.
5. Lodder MC, Lems WF, Ader HJ, Marthinsen AE, van Coeverden SC, Lips P, et al. Reproducibility of bone mineral density measurement in daily practice. Ann Rheum Dis 2004;63:285–9.
6. Liu H, Paige NM, Goldzweig CL, Wong E, Zhou A, Suttorp MJ, et al. Screening for osteoporosis in men: a systematic review for an American College of Physicians guideline. Ann Intern Med 2008;148:685–701.
7. Charles H. Chesnut III. Osteoporosis, an underdiagnosed disease. JAMA 2001;286:2865–6.
8. Arslan Ş, Çeliker R, Karabudak R. Cumulative corticosteroid doses and osteoporosis in patients with multiple sclerosis. Turk J Rheumatol 2010;25:191–5.
9. El Ö, Bircan Ç, Şahin E, Adalmaz B, Keskin Pehlivan E, Kızıl Ramazan, et al. The effect of alendronate in male osteoporosis. Turk J Osteoporos 2004;10:153–56.
10. Tekeoğlu İ, Akdoğan M, Takçı S, Harman H, Nalbant A, Kaleli S. Effect of statins on bone mineral density and bone turnover markers in postmenapausal women. New J Med 2015;32:157–60.
11. Rossini M, Adami G, Adami S, Viapiana O, Gatti D. Safety issues and adverse reactions with osteoporosis management. Expert Opin Drug Saf 2016;14:1–12.
12. Kanis JA, Mc Closkey EV, Johansson H, Cooper C, Rizzoli R, Reginster JY. European guidance for the diagnosis and management of osteoporosis in postmenopausal women. Osteoporos Int 2013;24:23–57.
13. Ma D, Wu L, He Z. Effects of walking on the preservation of bone mineral density in perimenopausal and postmenopausal women: a systematic review and meta-analysis. Menopause 2013;20:1216–26.
14. Muir JM, Ye C, Bhandari M, Adachi JD, Thabane L. The effect of regular physical activity on bone mineral density in post-menopausal women aged 75 and over: a retrospective analysis from the Canadian multicentre osteoporosis study. BMC Musculoskelet Disord 2013;14:253.
15. Bjarnason NH, Christiansen C. The influence of thinness and smoking on bone loss and response to hormone replacement therapy in early postmenopausal women. J Clin Endocrinol Metab 2000;85:590–6.
16. Kutsal YG, Atalay A, Arslan S, Başaran A, Cantürk F, Cindaş A, et al. Awareness of osteoporotic patients. Osteoporos Int 2005;16:128–33.
17. Gültekin SS, Arslan MS, Topaloğlu O, Delibaşı T. Fracture risk analysis in postmenopausal women with the current methods. J Clin Anal Med 2015;6:541–4.

How to cite this article:
Ayaz S, Döğen ME, Özçelik EB. Evaluation of Epidemiological Data of the Patients Undergoing DXA: Cross-Sectional Study in Suburbs. J Clin Anal Med 2017;8(suppl 2): 94-6.