

Frequency of osteoporosis in women aged over 50 years admitted to the Bone Density Measurement Center of Urmia Imam Khomeini Hospital in 2010-2013

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ABSTRACT

Introduction: Osteoporosis is a metabolic bone disease occurring in the form of reduced bone mass. It is practically defined based on measurement of bone mineral density. This research was conducted to evaluate the frequency of osteoporosis in women aged over 50 years admitted to Imam Khomeini Hospital of Urmia. **Methodology:** This cross-sectional research was carried out to evaluate the prevalence of osteoporosis in women aged over 50 years admitted bone density measurement center in Urmia Imam Khomeini Hospital during the years 2010-2013. Patients with metabolic bone diseases such as hyperparathyroidism or untreated hyperthyroidism, chronic renal failure, liver cirrhosis, chronic liver disease, corticosteroid use, malignancy, and patients undergoing chemotherapy and radiotherapy were excluded. The data were derived from existing medical records and analyzed by SPSS20 software. **Results:** A total of 3097 patients were included in this research. The results revealed that the mean age of the patients was 67.1 ± 13 (50-108) and the frequency of osteoporosis and osteopenia in hip was 164 (5.3%) and 282 (9.1%), respectively, and the frequency of osteoporosis and osteopenia in lumbar vertebrae was 796 (25.7%) and 260 (8.5%), respectively. **Discussion and conclusion:** Our research showed high prevalence of osteoporosis compared with osteopenia, especially in the lumbar vertebrae, and screening the osteoporosis is not recommended routinely in women aged over 50 years. Further studies are recommended in this regard.

Keywords: Osteoporosis, osteopenia, bone density measurement.

Introduction

Osteoporosis disease is a metabolic bone disease occurring in the form of bone density reduction. It is practically defined based on the measurement of bone mineral density, which is the most important predictor of fracture risk, and in the affected patients, bone mineral density more than 2.5 standard deviation is placed below the moderate of bone mineral density of young

population^[1]. The bone mineral density of each person is expressed in terms of the maximum level and the standard deviation of that value as a T-Score. These two parameters are commonly derived from young population of people. In fact, T-Score of each person has a standard deviation of the maximum bone mineral density between the ages of 20 and 30. DXA (Dual-Energy X-Ray Absorbtiometry) is a tool for measuring bone mineral density. This device is used for the diagnosis and screening of osteoporosis and osteopenia. World Health Organization (WHO) has classified

1. Normal: The maximum value of bone mineral density up to 1 standard deviation less than the reference value in young people.
2. Osteopenia: More than one and less than 2.5 standard deviation under the reference value in young people.
3. Osteoporosis: More than 2.5 standard deviation under the reference value in young people (T-Score < -2.5 SD)^[2]

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The genetic and environmental factors affect the development of osteoporosis. The most important of them include low physical activity, smoking, alcohol consumption, weight loss, calcium mal-absorption, vitamin D deficiency, previous bone fracture, corticosteroid consumption, hormonal factors, genetic factors and female gender. This disease increases the risk of fracture due to reduction in bone strength. While it does not show specified signs of fracture, it leads to death in many cases^[1]. In femoral fracture cases, 20 to 30% of patients die within one year after the onset of a fracture. The most common cause of osteoporosis is increased age and this disease develops sharply after 50 years of age^[3].

Almost 54% of women experience osteopenia after menopause, which 30% of them would experience the osteoporosis in the future. The prevalence of osteoporosis varies from 5% in women aged 50 years to 50% in women aged over 85 years^[4]. In the United States, osteoporosis is the cause of one and a half million fractures per year. In the United States, about 8 million women and two million men suffer osteoporosis, and 18 million suffer low bone mineral density, which are at the risk of osteoporosis. In women, the ovarian dysfunction in menopause (age of about 50 years) exacerbates the rapid reduction in bone mass, so that majority of women in the age group of 70 to 80 complete the disease criteria^[5]. Given the importance of this disease and the results of research carried out in different regions of Iran, this research was conducted in Urmia to provide a more accurate and reliable criterion for the frequency of osteoporosis in this province for its timely diagnosis and treatment.

Methodology

After approving the project in the Research Council of Faculty of Medicine and the Ethics Committee of the University, this descriptive and cross-sectional research was carried out to evaluate the frequency of osteoporosis in women aged over 50 years admitted to center for measurement of bone density in Imam Hospital of Urmia. The inclusion criteria of research included all women aged over 50 years admitted to the mentioned center, and people with following diseases were excluded: bone metabolic disease, such as hyperparathyroidism or non-treated hyperthyroidism, chronic renal failure, cirrhosis and chronic liver disease, corticosteroid consumption, malignancy, and patients undergoing chemotherapy and radiotherapy. To collect the data, the medical records of patients available at center of measurement of bone density was examined and entered to checklist. Finally, after completing the project, the results were analyzed by SPSS20 software.

Results

This cross-sectional research was carried out during 3-year period (2010-2013) at the Bone Density Measurement Center in Imam Hospital of Urmia. In this research, 3097 patients were

included. Examining the results revealed that the mean age of the patients was 67.1 ± 13 years (age range 50 to 89 years). The prevalence of osteoporosis and osteopenia in hip was 164 (5.3%) and 282 (9.1%) (Table 1), respectively, and the prevalence of osteoporosis and osteopenia was 796 (25.7%) and 260 (8.5%) in lumbar vertebrae (Table 2), respectively .

Table 1: Frequency of osteoporosis and osteopenia in the hip

%	f	
85.5	2651	normal
5.3	164	osteoporosis
9.1	282	osteopenia
100	3097	total

Table 2: Frequency of osteoporosis and osteopenia in the lumbar vertebrae

f	%	
2041	65.9	normal
796	25.7	osteoporosis
260	8.5	osteopenia
3097	100	total

No significant correlation was found between the results of bone density measurement and hip and those of lumbar vertebrae using chi-square test (P-value = 0.817)

Discussion and Conclusion

Osteoporosis is a metabolic bone disease occurring in the form of bone density reduction^[1]. The prevalence of osteoporosis varies from 5% in women aged 50 years to 50% in women aged 85 years and older^[4]. The present study was conducted to evaluate the prevalence of osteoporosis in women aged over 50 years admitted to bone density measurement center in Urmia Imam Hospital during 2010-2013. The results revealed that the prevalence of hip osteoporosis and lumbar vertebrae osteoporosis was 5.3% and 25.7%, respectively, and the prevalence of hip osteopenia and lumbar vertebrae osteopenia was 9.1% and 8.5%, respectively. In a study conducted in 2005, Kidambi et al.^[6] stated that 23.3% subjects had osteopenia and 9.3% of them had osteoporosis with a mean age of 54 ± 7 years, and having more than two children, menopause and smoking are associated with lower calcaneal bone mass and higher level of education and diabetes have higher the bone mass. In a study conducted in 2009, Lekamwasam et al.^[7] reported that 5.8% of the subjects had osteoporosis, and smoking, alcohol and milk consumption were not correlated with bone mineral density. Cheng et al.^[8] also reported that 29.7% of the subjects had osteoporosis and its prevalence in females was 4 times more than that in males. Dusti Iran et al.^[11] conducted a meta-analysis to determine the general prevalence of osteoporosis . After reviewing 31 studies, the general prevalence of osteoporosis in lumbar vertebrae was found 0.17% and the general prevalence of osteopenia was found

0.35% in subjects. They also showed that its prevalence is higher in older age groups, female gender and northern parts of the country. Aslan et al. ^[9] examined the patients admitted to bone density measurement center in 2012 during a 3-year period. Their study revealed that 19.6% of the subjects had osteoporosis.

Compared with the previous studies, our research showed that the prevalence of osteoporosis was higher in comparison with that of osteopenia, especially lumbar vertebrae, which it is not in line with the result of the meta-analysis study conducted by Dusti Iran ^[1]. The cause of this difference should be examined in the research population of two studies because our research was conducted on women aged over 50 years, indicating that gender is considered as one of the main risk factors for osteoporosis. In addition, the age of studied population was close to the age of menopause, indicating the effect of hormones on the increase of osteoporosis after menopause. In addition, our research results are line with those of the study conducted by Aslan et al ^[9], which its cause can be attributed to the effect of the same geographic climate of two studies. Our research results are also similar to those of research conducted by kidambi et al ^[6] and Lekamwasan et al ^[7] in terms of prevalence of osteoporosis. However, the prevalence of osteoporosis was reported lower in this study compared to the study conducted by Cheng et al ^[8].

Londona et al. ^[4] conducted a research in Colombia in 2013 and he found that 30.5% of the subjects had osteopenia and 4.8% of them had osteoporosis and 97.3% of them had at least one risk factor for osteoporosis. The age range of the subjects was 33-53 years, which was less than our age group, indicating the effect of age, especially after age of fertility and menopause, on development of osteoporosis. In addition, the difference in prevalence of hip and lumbar vertebrae shown in measurement of bone density suggests that early diagnosis of osteoporosis in the lumbar vertebra is more than that in hip. Lee et al. ^[3] carried out a research in 2013 to evaluate the prevalence of osteoporosis in South Korea. Their research revealed that the prevalence of osteoporosis was 7.8% in males and 37% in females. They also reported that the prevalence of osteoporosis in South Korea was high and age-related changes vary in incidence of the disease, depending on age and location of the disease. Our research was different from the study conducted by Lee et al. ^[3] in terms of gender and rate of prevalence, since our research was conducted on women aged over 50 years and the prevalence of osteoporosis was lower than that of osteoporosis in their research. Finally, based on this research and previous research results, it can be stated that the prevalence of osteoporosis has increased in recent years. Moreover, our research suggests that the prevalence of osteoporosis is high compared to the prevalence of osteopenia, especially in the lumbar vertebrae, and routine screening of osteoporosis is not recommended in women aged over 50 years. Further studies are recommended in this regard.

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