Appropriate age of Iranian Menopausal Women for Bone Mass Densitometry Testing

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Abstract: Osteoporosis is a condition of decreased bone density. That is a well recognized health hazard for postmenopausal women who are the main group at risk. Osteoporosis is often the cause of many health complications, as it progresses silently and unnoticed for years. The aim of the present study is to determine appropriate age of osteoporosis screening among Iranian women. Three hundred and twenty five female subjects referred for Bone Mass Densitometry (BMD) in Hamedan province, west of Iran, were studied in an analytic study. The effect of 82 different factors (in 5 categories), particularly the age was evaluated in osteoporosis case finding. Regression analysis, determination of significance level was done for each factor. Decision making analysis (CRT method) was performed. The results demonstrates mean age was 57(±9). Age, calcium-vitD consumption and Body Mass Index were significantly related to osteoporosis finding in BMD test. Age cutoff value for osteoporosis screening in the study population was 56.5 years old according to decision making analysis. BMD test might be done in all 56.5 old or older Iranian females and less than 56.5 age if she is menopause without estrogen therapy for equal or more than 6 years. Case finding probability in this approach is 77.7% and 64.8%, in abovementioned groups, respectively. This can also prevent unnecessary expenses of diagnostic procedures for people with out the risks of osteoporosis.

Key words: Osteoporosis; Age; Risk factor; Screening; Menopause; Calcium- vitD supplement.

INTRODUCTION

Osteoporosis is a common finding in postmenopausal women which increases health system cost as well as morbidity/ mortality among patients. A fifty years old woman has a 40 % risk of bone fracture in the rest of her life time. In a man with the same age the risk is 13 %( Vescini and etal, 2005). Osteoporosis is a progressive disease which increases the risk of bone fracture especially in hip, wrist and spine (Mcleod and Johnson, 2008). Although aging process results in decreased bone mass, Osteoporosis is not considered as a normal physiologic process and is categorized as a disease. Early diagnosis of Osteoporosis is essential to prevent bone fractures (Diez, 2002). In recent years due to higher life expectancy, more attention has been given to osteoporosis as a public health problem (Piscitelli and et al., 2009).Osteoporosis is a mostly asymptomatic and silently progressive to the point of fracture. So, the importance of early case finding is clarified (Diez, 2002). BMD is the best method of measuring bone density (Diez, 2002). An ongoing debate in prevention of bone fracture is determining suitable cases for BMD (Broussard and Magnus, 2004). In the United States of America, BMD screening is performed in white women more than 65 years old (Diez, 2002). Osteoporosis incidence is strongly related to the specific population and is variable in different races (Broussard and Magnus, 2004). The highest bone fracture rate due to Osteoporosis is found in the Middle East, Asia and Latin America. Osteoporosis is reported to be more common in Caucasian race (Cole et al., 2009). Incidence of Osteoporosis in a society and the health care budgets should be considered in determining the appropriate age for BMD screening in general population. The present research was performed to study the appropriate age of Osteoporosis screening in a group of Iranian women.

MATERIAL AND METHODS

Three hundred and twenty five women referred for bone densitometry were studied regarding their age and 82 osteoporosis risk factors categorized in five groups including physical activity, Ca-vitamin supplement, estrogen exposure, history of drugs and topographic characteristics as well as their BMD. Osteoporosis was diagnosed if patients T-score was less than 2.5 in the spine region (L2-L4) and other cases were categorized as healthy. Regression analysis was used to determine the relationship of different factors with Osteoporosis and more relevant factors were determined. Decision making analysis (CRT method) was done regarding age and Osteoporosis.
RESULTS AND DISCUSSIONS

In 325 studied cases mean and median age was 57(±9) and 56 (23-81), respectively. Menopausal status was found in 314(97%) of the cases. In menopausal women, length of menopause was less than one year in 44(14%), 2-5 years in 67(21%), 6-10 years in 72(23%) and more than 11 years in 131(42%). Among several studied factors, age(P<0.0005), calcium vitamin D supplement(P=0.04) and Body Mass index(BMI) (P=0.01) were significantly relevant to lumbar spine osteoporosis in BMD.

Fifty percent of the studied population had a history of calcium and vitamin D supplement consumption. Lumbar spine osteoporosis incidence in the study population was present in 202(62%). Decision making analysis (CRT method) revealed the cut off point of 56.5 years old in osteoporosis finding. That is, 77.7% positive finding in patients older than 56.5 years versus 49.2% in patients younger than 56.5 years old. In the more than 56.5 years old subgroup, Calcium and vitamin D supplement played an effective role in osteoporosis finding. In more than 56.5 years old people, 70% of calcium-Vitamin consumers and 84.6% of non-consumers were osteoporotic. In women younger than 56.5, the length of menopause was effective in the osteoporosis finding. In women younger than 56.5 with 5 or less menopausal years, 38.7% were osteoporotic in contrast to 64.8% in those with 6 years or more menopausal length(fig1).

Fig. 1: Decision making tree of lumbar spine osteoporosis finding in BMD testing of menopause women according to age, Ca-vitamin D consumption and menopausal years.

Discussion:

In the present study among women older than 56.5 years, densitometry can effectively find osteoporosis in 77.7% of patients. Accepted age of densitometry testing in white American women with no risk factor is 65 years old. It should be consider that our population might be referral which was referred due to having risk factors. Some other probable factors in osteoporosis finding in 77.7% of women older than 56.5 years in the present study includes the difference in race, physical activity, hormone therapy and Ca-vitamin D supplement therapy. In female population of more than 60 years in Italy, less incidence of osteoporosis was found, 22.8% (Crepaldia and et al., 2007).

In more than 56.5 years old age, Ca-vitamin D consumption decreases the osteoporosis probability: 70% versus 84.6%. Effective role of Ca-vitamin D in reducing osteoporosis identifies the Ca-vitamin D consumption as a target of public health education. On the other hand non-consumers of Ca-vitamin D older than 56.5 years seem to absolutely need BMD testing.

Many studies have shown the role of Ca-vitamin D consumption in increasing the bone density (Alola, 2008; Bischoff et al., 2005; Jackson et al., 2006; Hagey and Warren, 2008). In women younger than 56.5, menopausal years without estrogen replacement therapy was related to osteoporosis probability, leading to 64.8% rate of osteoporosis in BMD testing among patients less than 56.5 with more than 6 years of menopause.
Conclusion:
Iranian women fulfilling one or more of the following criteria are suggested to be screened using BMD testing:
1- Age more than 56.5 years old.
2- Less than 56.5 years old with more than 6 years of menopause and without estrogen therapy.

In addition to BMD as a diagnostic test, all the menopause women specially older than 56 years would benefit from receiving Calcium and vitamin D supplements and necessary education regarding sunlight exposure and physical activity. More studies in the future might confirm or modify the cutoff point of osteoporosis screening found in our study among Iranian women.

REFERENCES