



Study of Calcaneus Bone Densitometry in Post-Menopausal Women

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ABSTRACT: Osteoporosis is one of the most common age related diseases, especially in post-menopausal women who may have higher prevalence and risks of complications as fractures. The aim of this study is to determine average T-score and Calcaneos bone densitometry in post-menopausal women. It is a cross sectional study conducted on post-menopausal women aged between 40 to 60 years old who had been admitted to orthopedic ward of the Shahid Rajei Hopspital, Tonekabon, 2011. We used quantitative ultrasonography (QUS) of heel bones in Calcaneus bone densitometry. Data were analyzed by SPSS 20. We considered $P < 0.05$ as significant. A total of 50 women aged between 40 to 60 years participated in this study. Thirty five patients (70%) were osteoporotic and 15 patients (30%) were healthy. Fourteen patients (28%) of those with osteoporosis, had age of menopause, less than 5 years and 21 (42%) more than 5 years. No significant relationship was found between the mean T Score and the menopausal years ($p < 0.01$). This study showed that there is a significant relationship between Calcaneus bone loss and postmenopausal osteoporosis. Given the high prevalence of post-menopausal osteoporosis and its high costs of health care and long-term treatment, the need for comprehensive studies of screening and early detection, prevention and early treatment is recommended.

Key words: Calcaneus, Densitometry, T-Score, Osteoporosis, Post menopause.

INTRODUCTION

Osteoporosis is a known disease which is suffering more than 75 million people in Europe, Japan and it creates more than 3.2 million fractures in America and Europe annually (Lawrence, 2002). Prevention of osteoporosis and consequent fractures is important in health and quality of life (Seeman and Eisman, 2004). Besides risk factors of osteoporosis defined by national osteoporosis federation (NOF), some factors have direct effects including inadequate intake of calcium especially post menopause, lack of physical activity, low body weight, low estrogen levels, northern European ancestry, familial history of osteoporosis, smoking, drinking too much caffeine or alcohol and get plenty of protein and underlying diseases such as rheumatoid arthritis, endocrine and renal failure. In the pathogenesis of postmenopausal osteoporosis, it is proved that estrogen can inhibit absorption of Osteocalcin, raise intestinal absorption of calcium and renal re absorption of it and survive osteoblasts.

Following the loss of ovarian function in the absence of estrogen, Osteocalcin become more active and bone degradation in women rises quickly so that about 25-30% of bone mass will be lost in 5-10 years (William and Koopman, 2005).

Osteoporosis is one of the most common metabolic disorders all over the world and according to WHOM in 1991; it is one of the four enemies of humans with myocardial infarction, stroke and cancer. Epidemiologic researches showed that prevalence of osteoporosis changes among different countries can be 7 times more in western

countries. About 10 million Americans suffer from osteoporosis, and 18 million of osteopenia.

Researches about prevalence of complications of osteoporosis had attracted the attention of health authorities, as Jang and colleagues studied 362 postmenopausal women and Harssier and colleagues on 7.6 million patients with osteoporosis, 6 million of them were women. among them 4.3 % experienced at least one fracture, but only 21.7 % treated with anti- osteoporosis, so the cost estimated for the health system was about 5.4 billion Euros and given the costs of osteoporosis on the system and economic health of the society, basic steps needed to prevent believes (Von Mühlen et al., 1999).

According to higher incidence of osteoporosis in women and older ages, with loss of ovarian function, from the perspective of health policy it is essential for health care ministry to make plans properly for realistic approaching and complete investigations on lifestyle and dietary factors, epidemiology and prevention.

MATERIALS AND METHODS

It is a cross sectional study conducted on post-menopausal women aged between 40 to 60 years old who had been admitted to orthopedic ward of the Shahid Rajei Hopspital, Tonekabon, 2011. Patients with rheumatoid arthritis, hypo or hyperthyroidism, parathyroid and adrenal diseases, diabetes, liver and kidney failure and cancer were excluded. We used Quantitative Ultrasonography (QUS) of the heel bone mineral density. Those who had T Scores less than osteoporosis were considered at risk. Data

was analyzed by SPSS software version 20. $P < 0.05$ was considered statistically significant level.

RESULTS

The youngest patient was 47 years old and the oldest patient with osteoporosis was 60 years old. A total of 35 patients (70%) were with osteoporosis and 15 patients (30%) were diagnosed without osteoporosis. fourteen patients (61%) of those who had osteoporosis had age of menopause over 5 years and 21 of them (77.8%) had less than 5 years.

There was no significant association between osteoporosis and period of menopause. Although there was a significant correlation between the mean T Score and early menopause, and T score was higher in patients with earlier menopause.

DISCUSSION

In a previous study, the quantitative heel ultrasound compared with DXA machines for separation of healthy and osteoporotic postmenopausal women. In this study, the values associated with QUS T Score measured at the lumbar spine and femoral necks were 31% and 0.5%. Number 1 considered as the Cut point for quantitative ultrasound measurements of the heel (Boonen et al., 2003).

Estrogen deficiency during menopause decrease bone density. Larijani also studied bone mineral density of femoral and lumbar bones 10.5% and 16% lower in postmenopausal women than pre-menopausal women respectively (Boonen et al., 2003). In a study by Baher, the prevalence of osteoporosis in women before and after postmenopausal were 3.8% and 26.3%, respectively (Cummings et al., 1998).

In studies conducted in other countries similar results were obtained, including the prevalence of osteopenia and osteoporosis in non-Hispanic white women above 50 years were respectively, 17% and 42%. (Lips, 1987) In a study on 362 Dutch older than 45 years old postmenopausal women, it was determined that 30.60% women aged between 45-64 years, 52.2% of women between 65-74 years, and 67.5% of women older than 75 years were seen (Aranha et al., 2006).

Different prevalence of osteoporosis in different studies could be related to greater use of estrogen in women. In another study on 712 women aged between 55-84 years in Norway, the prevalence of osteopenia and osteoporosis were 42% and 7% respectively (Giannini et al., 2003; World Health Organization, 2000).

So from the results in this study, it is concluded that the prevalence of osteoporosis in postmenopausal women in this study is compatible with the results of other studies in this field. And different prevalence in different regions in Iran can be because of genetic factors, lifestyle, nutrition, and physical activity and hormone levels.

According to similar results of this study and previous studies, this is a prevalent problem in our country and it is recommended more studies about factors in osteoporosis to make plans for prevention, early treatment and decrease disabilities, costs of treatments and consequent fractures.

REFERENCES

- Aranha, L.L., Mirón Canelo, J.A., Alonso Sardón, M., Del Pino Montes, J. & Sáenz González, M.C. (2006). [Health-related quality of life in Spanish women with osteoporosis] *Rev Saude Publica*. Apr, 40(2): 298-303.
- Boonen, S., Kaufman, J.M., Réginster, J.Y. & Devogelaer, J.P. (2003). Patient assessment using standardized bone mineral density values and a national reference database. *Osteoporos Int*, 14:110-115
- Cummings, S., Black, D., Thompson, D., Applegate, W., Barrett-Connor, E., Musliner, T., Palermo, L., Prineas, R., Rubin, S., Scott, J., Vogt, T., Wallace, R., Yates, J. & LaCroix, A. (1998). Effect of alendronate on risk of fracture in women with low bone density but without vertebral fractures: results from the Fracture Intervention Trial. *JAMA*, 280:2077-2082
- Giannini S et al. (2003). Hypercalciuria is a common and important finding in postmenopausal women with osteoporosis. *Eur J Endocrinol*, 149(3):209-213.
- Lawrence, S.N. (2002). Adolescent Health care. A practical Guide. Lippincott. Williams&Wilkins. Fourth Edi.
- Lips, P et al. (1987). Determinants of vitamin D status in patients with hip fracture and in elderly control subjects. *Am J Clin Nutr*. Dec, 46(6):1005-1010.
- Seeman, E. & Eisman, J.A. (2004). Treatment of Osteoporosis. Why, whom, when and how to treat. *MJA Practice Essentials-Endocrinology*, 298-303
- Von Mühlén, D., Visby Lunde, A., Barrett-Conno, r E. & Betencourt, R. (1999). Evaluation of the Simple Calculated Osteoporosis Risk Estimation (SCORE) in older Caucasian women: the Rancho Bernardo Study. *Osteoporos Int* 10:79-84
- William, J. & Koopman, L.w. (2005). Moreland, arthritis and allied conditions, A Text book of Rheumatolog. Vol1A. 2005
- World Health Organization. (2000). How is public interest protected. In world Health Report 2000; Health systems: Improving Performance.