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Professional paper

Implementation of Program of Prevention and Early Detection of Osteoporosis among Women of Primorsko-goranska County

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A B S T R A C T

The aim of this paper is to present preliminary data of Program of prevention and early detection of osteoporosis among women in Primorsko-goranska County. Osteoporosis is recognized as a public health problem for which clearly preventive measures are defined. Measurement of bone density was done by ultrasound densitometry of the calcaneus among women aged from 45 to 69 years old. 688 women were examined and they were classified in five five-year age groups. The women with the osteoporosis (T-score ≤2.5) were 141; osteopenia (T-score from –2.5 to –1) were found in 400 women, and those with normal range of T-score were 147. All of five groups of women had T-score in range of osteopenia (T-score ≤1). A statistically significant difference was between the first and fourth groups of women (p=0.002) and the second and fourth groups (p=0.001). After examination, depending on the value of T-score, women were recommended to visit family doctor and they also got educative booklet with advices for healthy nutrition and physical activity. Implementation of this program indicated the importance of proper lifestyle in the prevention of osteoporosis. Average T-scores of all five groups of women show that osteopenia occurs also in the youngest ones. This indicates the need for a systematic approach to preventing osteoporosis through education of women including younger ones and creating conditions for organized physical activities at the community level.

Key-words: *mineral bone density, screening, osteoporosis, women, physical activity*

Introduction

Osteoporosis is a progressive bone disease characterized by low bone mass and microarchitecture disorder, which results in reduced bone strength and increased fracture risk. The disease occurs as the silent epidemic, it developed without specific symptoms and causes significant disability and mortality.

Bone mass achieved peak of density in period of mid-20th to 30 year of life. Bone mass begins to reduce mildly at the age of 35 year and intensively after 50th year of age. Risk factors for osteoporosis are heritage, gender, estrogen loss, low weight, high age, diet, exercise, diseases and lifestyle[1]. The best way to prevent osteoporosis as major socio-economic and public health problem) are building strong bones in youth and prevent loss of bone mass in old age. Osteoporotic fractures, especially hip, are associated with chronic pain, reduced movement, loss of independence, reduced quality of life and increased mortality[2]. The only interventions that have a good effect in the prevention of osteoporosis include physical exercise and taking supplement of calcium and vitamin D[1,3].

Teaching Institute of Public Health of Primorsko-goranska County started a program of prevention and early detection of osteoporosis among women of Primorsko-goranska County in 2010. The aim of this preventive program was to increase awareness about osteoporosis and education of women about measures of primary, secondary and tertiary prevention. Changing lifestyles, including smoking cessation, adequate intake of vitamin D

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and regular exercise in order to regulate body weight and strengthening the musculature, in perimenopause can reduce the risk of developing osteoporosis[4].

Participants and Methods

Measurement of bone density was done by ultrasound densitometry of the calcaneus among 688 women aged from 45 to 69 years old (Clinical Bone Sonometar SAHARA Hologic).

Women aged 45–69 years were measured bone density ultrasound densitometry right calcaneus (Clinical Bine Sonometar SAHARA Hologic). This method was chosen because it is financially acceptable, device is portable and the patient is not exposed to ionizing radiation. Measurements were carried out in four municipalities in the Primorsko-goranska County. Women were invited to measurements through the local medias. Trained physician performed the measurements.

Every woman has fulfilled questionnaire about diet, physical activity and diseases before measurement. For each woman was calculated body mass index.

Since the Program and data are still in progress, this article presents the results of ultrasound densitometry expressed as a T-score.

Regardless of age, women were divided in five groups. After examination and value of T-score, women were recommended to visit family doctor and they also got educative booklet with advices for healthy nutrition and physical activity.

Results

We examined 688 women. The women with the osteoporosis (T-score ≤2.5) were 141; osteopenia (T-score from –2.5 to –1) were found in 400 women, and those with normal range of T-score were 147. Women were divided into five groups in consideration of age (Table 1). For each group was calculated average of T-score (Table 2).

TABLE 1
DISTRIBUTION OF WOMEN IN FIVE AGE GROUPS

Group	Age	N
I	65–69	100
II	60–64	210
III	55–59	193
IV	50–54	139
V	45–49	46
Total	–	688

All of five groups of women had T-score in range of osteopenia (T-score ≤1). A statistically significant difference was between the first and fourth groups of women (p=0.002) and the second and fourth groups (p=0.001).

TABLE 2
THE VALUES OF T – SCORE OF WOMEN WITH REGARD TO THE AGE GROUP (±SD)

Group	Age	T-Score
I	65–69	–1.918±1.313*
II	60–64	–1.821±1.128**
III	55–59	–1.637±1.811
IV	50–54	–1.165±1.251
V	45–49	–1.179±1.152

* Statistical significant difference between groups I and IV (p<0.05)
** Statistical significant difference between groups II and IV (p<0.05)
Scheffé post-hoc test found a statistically significant difference in the value of T-score between the respondents group I and group IV (p=0.002) and between groups II and IV (p=0.001).

Discussion

Osteoporosis is an important public health problem, and predictions based on future demographic changes suggest that the costs are likely to increase. One model suggests that there may be 6.26 million hip fractures world-wide per annum by the year 2050[5]. According to U.S. Preventive Services Task Force (USPSTF), one half of all postmenopausal women will have an osteoporotic--related fracture during their lifetime; 25% of these women will develop a vertebral deformity, and 15% will experience a hip fracture[2,5]. It has been estimated that about 200 million women are affected worldwide[6]. Osteoporotic fractures, particularly hip fractures, are associated with chronic pain and disability, loss of independence, decreases quality of life, and increased mortality. It is difficult to quantify precisely the morbidity caused by osteoporotic fractures, because both the prevalence of disability and osteoporosis correlate strongly with age. It has been estimated that osteoporotic fractures of the hip, distal forearm and spine cause 7.6% of women to become dependent in activities of daily living and another 7.8% to require nursing home care for an average of 7.6 years. Up to one-third of hip fracture patients may become totally dependent and require long-term institutionalization[5]. For all demographic groups, the rates of osteoporosis increase with age[2]. Elderly patients have increased susceptibility for fractures because they commonly have additional risk factors for fractures, such as poor bone quality and an increased tendency to fall[2].

The Health Evidence Network synthesis report seeking to determine the effectiveness of the prevention and screening of osteoporosis shows that several measures, such as moderate physical activity, an appropriate intake of calcium and vitamin D, cessation of smoking, and pharmaceutical intervention in high-risk groups for preventing osteoporosis are effective[4–8].

There is no direct evidence that screening for osteoporosis reduces fractures, but it shows that there is good indirect evidence that screening is effective in identifying

postmenopausal women with low bone mineral density and that treating osteoporosis can reduce the risk of fractures in population.

The most commonly used bone measurement test used to screen for osteoporosis are DXA of the hip and lumbar spine and quantitative ultrasonography of the calcaneus. Quantitative ultrasonography is less expensive and more portable than dual-energy x-ray absorptiometry (DXA), does not expose patients to ionizing radiation, and can be feasibly be implemented in primary care settings. Quantitative ultrasonography of the calcaneus predicts fractures of the femoral neck, hip, and spine as effectively as DXA. However, current diagnostic and treatment criteria for osteoporosis rely on DXA measurements only, and criteria based on quantitative ultrasonography or a combination of quantitative ultrasonography and DXA have not been defined[2,9].

Several randomized controlled trials have demonstrated that the physical activity of walking increases the bone density in postmenopausal women. Also, other physical activities, such as aerobics and weight-bearing exercises, increase the bone density of the spine. An increased tendency to fall may be effectively prevented – for example by doing Tai Chi exercises and doing muscle and balance training[7].

A combination of vitamin D and calcium may reduce the rate of fracture by about 30% – in particular, for people more than 60 years old and for those who show adherence to treatment[7]. Encourage basic bone health for all individuals including: regular active exercise, calcium (diet and supplements) 1 200 mg daily, vitamin D 800–2 000 IU daily after age 50 (400–1 000 for those <age 50 at low risk) and fall prevention strategies[10].

In postmenopausal women who have no previous osteoporotic fractures, the USPSTF found convicting evidence that drug therapies reduce the risk of fractures in women aged 65 years and older and in young women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors, the USPSTF judged that the benefit of treating screening--detected osteoporosis is at least moderate[2,5].

In a prospective study conducted in the UK was measured bone mineral density (BMD) among 6 282 women. In 36% of women BMD were found at a level that requires intervention. The percentage of women with a T-score less than –2.5 in our population was 20.5%. Although the greatest relative risk of fracture is in individuals with osteoporosis, the absolute number of fractures in those with bone mineral density T-scores in the osteopenia range is the same or greater than in those with T-scores in the osteoporosis range[1,11]. In our population of women those with osteopenia were 58.1%.

All of five groups of women had T-score in range of osteopenia (T-score ≤1). In study conducted on women aged 20–29 years, Pattison et al. found that 19.3% of them had T-scores between –1.0 and –2.5, i.e. in the area of osteopenia, which indicates that it occurs in younger age groups of women[12]. Normally the average T-score increases with age of women, but concerning fact is that it is among women aged 45–49 years in the area of osteopenia. It is therefore implemented education and counseling women about the desirable way of life. Emphasized the importance of regular physical activity, intake of calcium and vitamin D, which can improve T-score and significantly slow down the bone demineralization.

Conclusion

The aim of this Program was to raise attention to the importance of healthy lifestyles in the prevention of osteoporosis. Guidelines for the early detection of osteoporosis recommend screening among women older than 65 years [2,7,13,14], but this procedure is not performed systematically in our country. The implementation of this program (ultrasound densitometry, education, and counseling), we wanted to achieve public health impact-promoting physical activity and proper nutrition, and stress the importance of women taking responsibility for their own health. These results were below our expectations.

The average T-scores of five-years groups of examined women show that osteopenia occurs in those in the youngest age of 45–49 years and 50–54 years.

This indicates the need for a systematic approach to preventing osteoporosis through education at the community level and creating the conditions for their organized physical activity.

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PROVOĐENJE PROGRAMA PREVENCIJE I RANOG OTKRIVANJA OSTEOPOROZE U ŽENA PRIMORSKO-GORANSKE ŽUPANIJE

S A Ž E T A K

Cilj je ovoga rada prikazati preliminarne podatke Programa prevencije i ranog otkrivanja osteoporoze u žena Primorsko-goranske županije. Osteoporoza je prepoznata kao javnozdravstveni problem za čiju prevenciju postoje jasno definirane mjere. Mjerenje gustoće kostiju provedeno je ultrazvučnom denzitometrijom desne petne kosti žena u dobi od 45 do 69 godina. Pregledano je 688 žena svrstanih u pet petgodišnjih dobnih skupina. Žena s nalazom osteoporoze (T-score ≤2,5) bilo je 141, osteopenije (T-score od –2,5 do –1) 400, a onih s nalazima u granicama normale (T-score≥1) bilo je 147. Svih pet skupina ispitanica imalo je prosječan T-score u području osteopenije (T-score ≤1). Statistički značajna razlika bila je između prve i četvrte skupine žena (p=0,002) i druge i četvrte skupine (p=0,001). Nakon pregleda, s obzirom na vrijednost T-score, dobile su preporuku da se jave svome obiteljskom liječniku i edukativne knjižice s uputama za pravilnu prehranu i tjelesnu aktivnost. Provođenjem ovog Programa ukazalo se na važnost pravilnoga načina života u prevenciji osteoporoze. Prosječni T-score svih pet skupina pregledanih žena pokazuju da se osteopenija pojavljuje i kod onih najmlađih. To upućuje na potrebu sustavnog pristupa prevenciji osteoporoze kroz edukaciju i mlađih žena te, na razini zajednice, stvaranje uvjeta za njihovu organiziranu tjelesnu aktivnost.