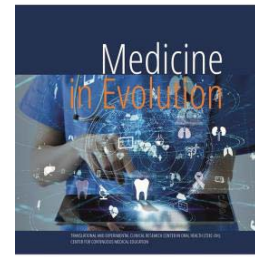


Silent bone epidemic - osteoporosis



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Abstract

According to the U.S. International Osteoporosis Association, more than 44 million people have osteoporosis or face the threat of developing osteoporosis due to low bone density results. Estimates place osteoporosis by the end of 2021 around 60 million.. Every three seconds in the world a fracture happens due to the decrease in bone density, causing almost 10 million fractures just because of the pressure on the bones affected by osteoporosis. In general, osteoporosis is associated with a weakened, sarcopenic muscular system so there is no strong support for the degenerated bone.

Keywords: Osteoporosis, sarcopenia, postmenopausal, fracture, bone

INTRODUCTION

Osteoporosis is a degenerative bone disease that causes the loss of bone mass and bone tissue. It is common in patients immobilized for a long period of time, in people in postmenopausal disease, medication (steroids) in malignant diseases, poor lifestyle, etc. In the known process of bone resorption, men develop more bone during their lives than women, so the ratio of men to women in this condition inclines towards women with a higher number.

Osteoporosis is a condition for which there is a remedy, it is treatable and can be reversible.

It can be prevented for longer periods of time by preventive and attack methods.

It is very important to have early detection, to know its types, what are its causes and how to intervene in its treatment.

EPIDEMIOLOGY

Because the average life span on the world level will increase the incidence and prevalence of osteoporosis, its economic resounding over the various population groups will increase in the years to come [1-3].

Who considers osteoporosis the second health problem in the world, after cardiovascular diseases. More than 75 million people suffer from osteoporosis in Europe, the US and Japan.

Osteoporosis causes more than 8.9 million fractures worldwide each year, which means an osteoporotic fracture every 3 seconds in EU countries [1,4].

More than 200 million women in the world have osteoporosis; estimates indicate that the number of osteoporotic fractures that occur in them will increase from 1.6 million to 6.2 million in 2050, which requires the urgent development of prophylaxis strategies [5-8].

Osteoporosis can be: primary or secondary. Primary osteoporosis is the most common form and is due to age-related bone loss. It is classified in type I and type II [9,10]. Secondary osteoporosis results from the presence of other diseases or conditions that predispose to bone loss and is classified as "type III".

Osteoporosis type I, is post menopause osteoporosis present in 5-20% women, affects those with 15-20 years of menopause with a peak of the incident between 60-70 years. The incidence in women is 8 times higher than in men. Osteoporosis frequency of post menopause shows a rate, a men's women ratio 2:1 to 3:1 [11-13]. Estrogenic deficiency is the cause of this form of osteoporosis, making the skeleton more sensitive to PTH resulting in increased calcium resorption in the bones. This will have the effect of decreasing the secretion of PTH, producing 1,25-dihydroxy vitamin D and calcium absorption, these will result in the loss of trabecular bone that leads to vertebral subsidence and colles fracture. Women can lose around 2-3% of bone mass per year in the first 5 years after menopause [14,15]

Due to the massive decrease in estrogenic production, women lose almost 50% of the trabecular bone and 35% of the cortical bone throughout their lives, pec and men lose only 25% of both types of bone [16].

At least 75% of the bone loss that occurs in women in the first two decades after menopause can be attributed to estrogenic loss rather than age.

The bone loss associated with menopause does not begin at the time of amenorrhea but after 2-3 years [17].

Osteoporosis type II, occurs in women or men over 70 years of age and is usually associated with the decrease of bone formation along with the decrease of the kidney's ability to produce 1.25(OH)₂ D₃, deficient in vitamin D results from the increase of calcium absorption that increases the PTH level and especially bone resorption.

In osteoporosis type II, the cortical and trabecular bone is lost increasing the risk of hip fracture and vertebral fracture. Osteoporosis type III, or secondary osteoporosis, occurs

equally in women and men at any age. In men most cases are due to diseases or drug therapy, but in 30-35% of cases the cause can not be identified [18].

This type of osteoporosis is associated by a wide variety of conditions including: hormonal dysfunction (Cushing's syndrome), cancer (especially multiple myeloma), gastrointestinal disorders (especially inflammatory bowel diseases that cause malabsorption) medication (corticosteroids, chemotherapy, anticonvulsants, heparin, barbiturates, GnRH, conH antacids, antacids with high aluminum content).

Chronic renal failure, hyperthyroidism, immobilization, osteogenesis imperfecta, inflammatory arthritis, malnutrition due to anorexia nervosa. About 32% of women up to 80 years of age may experience a fracture of the femoral neck. The risk of a femoral neck fracture is equal to the risk of breast, cervical, uterus cancer and is equal to the mortality in breast cancer.

The prevalence of vertebral fractures is 42% in older women with low bone mass. In women there is an increased rate of vertebral fracture, which is initially associated with menopause, followed by cervical fracture associated with decreased age and decreased bone mass [18-21]

Osteoporosis develops less in men than in women because in men bone loss begins later than in women and progresses much more slowly, due to the period of hormonal changes that is also slower. It will also make the bone loss smaller.

The difference in bone geometry and remodeling also contributes to a low fracture rate in men. Osteoporosis in men is an important public health problem, especially since the number of men over the age of 70 years will double between 1993-2050. In the elderly the use of psychotropic agents, give an increased rate of orthostatic hypotension (frequency in antihypertensive medication) and the wider use of polymedication contribute to the increased incidence of falls, the consequence being fractures [22].

RISK FACTORS

The two major risk factors determining the occurrence of osteoporosis are, the loss of bone mass and the speed of bone loss. These two determining factors are influenced by a number of genetic factors and environmental factors. Approximately 70% of the causes of osteoporosis are the result of genetic predisposition, including the role of genetics in determining how an individual responds to various exogenous stressors.

A percentage of 30% of cases are determined by environmental factors. Ethnic or racial origin is an important risk factor for bone mass loss. White and Asian women have the highest risk, but blacks and hispanics are protected because bone loss is slower [1,18].

Any factor resulting from estrogenic deficiency, especially before physiological menopause, involves increasing the risk of bone loss.

Women have a particular risk who have had an early menopause or a late menarche, or those who had a premenopausal oophorectomy or amenorrhea.

In men, the decrease in testosterone due to hypogonadism has been associated with the development of osteoporosis. Prolonged bed rest and sedentary lifestyle are important risk factors for osteoporosis.

Less well known are risk factors that include family clinical history especially on the maternal line and short stature. Indeed, the evidence suggests that obesity can be a protective factor against osteoporosis due to the conversion of androgen hormones into estrogens, into peripheral adipose tissue [23]. Constant consumption even in small amounts of alcohol has been clearly identified as a risk factor of osteoporosis even in young people, women or men. Large drinkers are more prone to bone loss and fracture due to malnutrition and the risk of falling. Although the exact mechanism by which alcohol influences bone metabolism is not clear, it seems that it is a combination of the direct effect of alcohol on the bone cell and indirectly effect on hormones that intervene in hormonal metabolism: as metabolites of

vitamin D, PTH and calcitonin. Alcoholics have high levels of corticoids in the blood; these hormones produced by the adrenal cortical glands induce bone loss. Recent studies have shown that women smokers have low levels of estrogens and have an early menopause compared to non-smokers. Smokers can be considered to have increased risk for osteoporosis. The role of caffeine is very controversial, it has been proven that tea drinkers are less exposed than those who drink coffee. Caffeine is a diuretic and causes hypercalciuria. It has been proven that the elderly are less able to compensate for the diuretic effect of caffeine by believing the serum concentration of dihydroxy-vitamin D. Older people who are big coffee drinkers have a negative calcium balance that aggravates bone loss due to age. Malnutrition due to food disorder is a risk factor [24]. The osteoporosis diagnosis is made with the DEXA device (osteodensitometry). The location between the normal bone density and the average bone density level, between 1 and 2.4 standard deviations below the average level of bone density. The level of the T score above -2.4 denotes a definite diagnosis of osteoporosis.

DISCUSSIONS

Osteoporosis may not be detected until the first fracture in the bone occurs due to load pressure, or it may be by fall, for example, the Pouteau-Colles fracture [23].

Osteoporosis is a skeletal disorder characterized by compromised bone strength leading to an increased risk of fracture. It is defined as a BMD that lies 2.5 SD or more below the average value for young healthy women, as measured with DEXA. According to the current guidelines on osteoporosis management, BTMs cannot diagnose osteoporosis, but changes in BTMs may be useful in monitoring osteoporosis treatment to confirm the efficacy of treatment and treatment adherence and can improve the specificity of assessment of fracture risk. All postmenopausal women should be encouraged to maintain a healthy weight; to obtain adequate calcium, vitamin D, and protein intake; to participate in appropriate exercise; to avoid excessive alcohol consumption and smoking; and to utilize measures that prevent falls. Finally, drug therapy is recommended in all postmenopausal women who have a history of osteoporotic vertebral or hip fracture, in those who have BMD values consistent with osteoporosis, and in those who have T-scores from -1.0 to -2.5 and a 10-year risk of major osteoporotic fracture [24].

Ideally, the treatment of this pathology should be extended to the muscular system, because in general the risk factors of osteoporosis attack to a great extent the muscular system, it is a tandem, it is not possible to separate the functionality of the skeletal muscular system. It is good to take into account this synergistic duality, in order to be able to reinstall functional potency and a good quality of life of patients [25,26].

The treatments available for osteoporosis are aimed directly at causing the loss of quality of the bone system. First of all, the treatments would be necessary to correct the vitamin deficiencies such as, Ca, Vit. D, hormonal, etc. It has been shown that giving up a faulty, carential lifestyle has done nothing but substantially improve the state of the skating system [27].

CONCLUSIONS

Through rapid identification and attack treatment, bone degeneration can be stopped and even a considerable regression of bone system degeneration.

Osteoporosis prevention begins in childhood, when a healthy diet for bones and exercise helps children increase bone mass.

For women, early prevention is especially important, because after menopause the protective effect of estrogen is lost.

Making dietary changes, getting enough exercises, and avoiding bad lifestyle habits help prevent osteoporosis.

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