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Review article

Guidelines of the Brazilian Society of Rheumatology for the diagnosis and treatment of osteoporosis in men

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ARTICLE INFO

Keywords:

Osteoporosis
Men
Guidelines
Diagnosis
Therapy

ABSTRACT

Osteoporosis, a metabolic disease characterized by low bone mass, deterioration of the bone tissue microarchitecture and increased susceptibility to fractures, is commonly regarded as a women's health problem. This point of view is based on the fact that compared with men, women have lower bone mineral density and longer lifespans and lose bone mass faster, especially after menopause, due to a marked decrease in serum estrogen levels. However, in the last 20 years, osteoporosis in men has become recognized as a public health problem due to the occurrence of an increasingly higher number of fragility fractures. Approximately 30% of all hip fractures occur in men. Recent studies show that the probability of fracture due to hip, vertebral or wrist fragility in Caucasian men older than fifty years, for the rest of their lives, is approximately 13% versus a 40% probability of fragility fractures in women.

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<http://dx.doi.org/10.1016/j.rbre.2017.07.003>

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Men show bone mass loss and fractures later than women. Although older men have a higher risk of fracture, approximately half of all hip fractures occur before the age of 80. Life expectancy is increasing for both sexes in Brazil and worldwide, albeit at a higher rate for men than for women. This Guideline was based on a systematic review of the literature on the prevalence, etiology, diagnosis and treatment of osteoporosis in men.

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Diretrizes da Sociedade Brasileira de Reumatologia para diagnóstico e tratamento da osteoporose em homens

R E S U M O

Palavras-chave:

Osteoporose
Homens
Diretrizes
Diagnóstico
Terapia

Osteoporose, uma doença metabólica caracterizada por baixa massa óssea, deterioração da microarquitetura do tecido ósseo e aumento da suscetibilidade a fraturas, é comumente vista como um problema de saúde feminino. Essa visão tem fundamentos: em comparação com os homens as mulheres têm densidade mineral óssea menor, têm vida mais longa e perdem massa óssea mais rapidamente, principalmente após a menopausa, devido à diminuição acentuada dos níveis séricos de estrógeno. Entretanto, nos últimos 20 anos a osteoporose no homem tem sido reconhecida como um problema de saúde pública devido à ocorrência cada vez maior de fraturas por fragilidade. Cerca de 30% de todas as fraturas de quadril ocorrem em homens. Estudos recentes mostram que a probabilidade de fratura por fragilidade do quadril, vértebra ou punho em homens brancos após os 50 anos, pelo resto de suas vidas, situa-se em torno de 13%, 40% nas mulheres. Os homens apresentam perda de massa óssea e fraturas mais tardiamente do que as mulheres. Embora os homens mais idosos tenham maior risco de fratura, cerca de metade das fraturas de quadril ocorre antes dos 80 anos. A expectativa de vida tem aumentado para ambos os sexos no Brasil e em todo o mundo, porém em uma velocidade maior para homens do que para mulheres. Esta Diretriz foi baseada em uma revisão sistemática da literatura com relação a prevalência, etiologia, diagnóstico e tratamento da osteoporose em homens.

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Introduction

Pathophysiology of bone loss in men

Osteoporosis is a metabolic disease characterized by low bone mass, deterioration of the bone tissue microarchitecture and increased susceptibility to fractures. Osteoporosis is commonly regarded as a women's health problem. This point of view is based on the fact that compared with men, women have lower bone mineral density (BMD) measured by area (g/cm^2) and a longer lifespan and lose bone mass faster, especially after menopause, due to the marked decrease in serum estrogen concentrations. However, in the last 20 years, male osteoporosis has become recognized as a public health problem due to the increasingly common occurrence of fragility fractures. Approximately 30% of all hip fractures occur in men.¹

Skeletal development shows some differences between men and women. Men have longer and wider appendicular bones with thicker cortices than women. After birth, the bone growth patterns of appendicular (arms and legs) and axial (spine) bones differ between men and women. The accelerated growth of the skeleton before puberty is due much more to the development of the legs than of the spine for both sexes. Thus,

the onset of puberty, usually later in boys than in girls, results in longer bones in men than women.² Furthermore, cortical thickness increases during the peripubertal period due to the increased formation of periosteal bone in boys. In this period, the female bone has reduced periosteal formation but with increased endocortical apposition. In other words, the male bone grows more "on the outside" and the female bone more "on the inside".

Androgens, growth hormone (GH) and insulin-like growth factor (IGF-1) stimulate periosteal apposition in men, whereas estrogens inhibit this apposition in women, making the long bones narrower in women than in men.³ Endosteal apposition in women most likely depends on estrogenic action. Due to the greater muscle development in men, there is subsequent apposition of cortical bone in long bones, increasing even more their torsional strength. Men reach a peak bone mass that is 8–10% higher than that in women, which is a further determinant of male protection against fractures.⁴

The losses of trabecular and cortical bone mass, which progress with aging, begin at different stages for men. The loss of trabecular bone mass begins in the young adult, whereas the loss of cortical bone mass is delayed and occurs more frequently after 50 years of age.⁵ Male bone loss associated with the onset of fractures occurs after 70 years of age.⁶

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