
Osteoporosis in Men

A New Type of Patient

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Until recently, the diagnosis of osteoporosis in men was uncommon and, when present, it was typically described as a consequence of secondary causes.

However, mounting evidence is revealing that men have higher rates of osteoporosis¹ and fragility fractures^{2,3} than previously assumed. One in eight men over the age of 50 experiences an osteoporosis-related fracture in his lifetime,⁴ and almost 30% of all hip fractures occur in men.⁵

How is the diagnosis made?

The diagnosis of osteoporosis is presently based on dual X-ray absorptiometry (DXA) bone mineral density (BMD) measurement. The BMD diagnostic method has been designed to identify post-menopausal white women at high risk for fracture. The World Health Organization (WHO) defines osteoporosis as BMD T-score < -2.5. There have not been comprehensive investigations for the utility and validity of this measurement in male popula-

AI's case

AI, 57, presented with lower back pain of a few weeks' duration. He admits drinking three to five beers per day for the past 20 years. He also smokes one pack of cigarettes daily. He suffers from chronic obstructive pulmonary disease, for which he uses inhalers.



A spine X-ray revealed compression fractures at L1 and L5 (Figure 1, page 92).

Bone mineral density study revealed a T-score of -3.5 at the spine and -2.6 at total hip.

Complete blood count, erythrocyte sedimentation rate, and protein electrophoresis were normal.

What's your diagnosis?

For more on AI, go to page 94.

tions. As a consequence, there is still some uncertainty on how to interpret BMD measurement in men. Currently, there are no diagnostic or intervention thresholds available for men.

Until such data is available, the WHO criteria designed for women are used to diagnose osteoporosis in men. It is important to note that fragility fracture is the most common clue to make the diagnosis. Other clues that should lead to BMD testing in men are listed in Table 1.

What are the risk factors?

In men, corticosteroid use, alcohol abuse, and hypogonadism account for 40% to 50% of all cases of osteoporosis.⁶ However, it is important to rule out other causes, such as primary hyperparathyroidism, anticonvulsant use, gastrointestinal disorders, multiple myeloma, and other malignancies. If no cause has been identified, we are dealing with idiopathic osteoporosis, which also accounts for 40% to 50% of cases.⁶ Bone biopsy studies in males with idiopathic osteoporosis show that osteoporosis results primarily from decrease bone formation. In contrast, the accelerated state of bone loss is the predominant mechanism for osteoporosis in post-menopausal women.

There are a number of studies suggesting a prior fragility fracture is an important factor for future fractures in both men and women. In an American study, previous Colles' fractures were significantly related to an increased risk of hip fracture in both men and women.⁷ In addition, prior vertebral fractures were associated with a

high risk of subsequent vertebral fractures in both genders, with men having a greater risk of refracture compared to women.

Other risk factors are listed in Table 2.

How can osteoporosis be prevented?

The goal of preventive therapy is to avert bone loss and maintain bone mass. The prevention of osteoporosis in men must begin at childhood to ensure optimal attainment of peak bone mass during young adult life. Prevention should include assessment and advice regarding diet and lifestyle risk factors.

Calcium and vitamin D

The majority of studies report a slowing of bone loss with calcium and vitamin D therapy. A randomized, controlled trial (RCT), which supplemented community-living men and women (older than 65 years) with calcium, 500 mg, and vitamin D, 700 IU, for three years found significant treatment effects for BMD at the femoral neck, lumbar spine, and total body. The trial also found a significantly lower rate of non-vertebral fracture compared to the placebo group.⁸

Exercise

Large, prospective, epidemiologic studies have shown that involvement in vigorous physical activity significantly decreases the risk of hip, but not vertebral, fracture.⁹⁻¹¹ The non-beneficial effect at the spine may reflect increased risk of traumatic vertebral fracture during activity. Unfortunately, in most men, the antifracture benefit observed with physical activity is lost

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Osteoporosis in Men

Table 1

When is BMD recommended in men?

BMD should be measured in men if they:

- Have fragility fracture
- Have prevalent vertebral deformity
- Show radiographic evidence of osteopenia
- Are 50 years old with risk factors

*All men over 65 should be tested.

after the cessation of exercise. Perhaps the main role exercise has on decreased fracture risk is strengthening muscle and enhancing muscular co-ordination, thereby decreasing the likelihood of falling.

Alcohol and smoking

There is abundant evidence supporting the

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argument that lifestyle choices have a noteworthy impact on bone health. For instance, in men, there is a significant risk of vertebral and hip fracture with heavy, long-term alcohol consumption.^{12,13}

How is osteoporosis in men

Table 2

Risk factors for osteoporosis in men

Most common causes (40-50%)	Prevalence
• Glucocorticoid excess	17%
• Alcohol abuse	15%
• Hypogonadism	15%
Idiopathic or primary causes	40-50%
Other causes	
• Advanced age	
• Smoking	
• Malignancy	



Figure 1. AI's X-ray showing compression fractures at L1 and L5.

treated?

There is minimal evidence to recommend treatment of osteoporosis in men on the exclusive basis of T-score BMD measurement. Although the prevention of low bone mass may be the best approach for lifelong

skeletal adequacy, there have been a number of promising therapies for the treatment of osteoporosis in men.

Bisphosphonates

In a RCT of osteoporotic men, two years of alendronate, 10 mg/day, significantly increased BMD at all measured skeletal sites and significantly decreased vertebral fracture incidence compared to the control group.¹⁴

Further, in a two-year, open-label, RCT of 134 men with primary established osteoporosis and normal serum testosterone levels, the alendronate (10 mg/day) group exhibited significantly greater gains in lumbar spine and femoral neck BMD compared to the alfacalcidol-treated group (1 mcg/day).¹⁵ The data from these two alendronate studies clearly document the safety and efficacy of alendronate in men.

The use of bisphosphonates in the prevention and treatment of corticosteroid-induced osteoporosis is well-documented. In the only exclusively male-based study, the authors concluded that risedronate, 5 mg/day, was effective in both the treatment and prevention of corticosteroid-induced osteoporosis and significantly decreased the prevalence of vertebral fractures after one year of treatment.¹⁶

Sex hormones

The role of androgen therapy in the treatment of osteoporosis in men is uncertain. Androgen replacement therapy has positive effects on BMD in hypogonadal men, particularly those with open epiphyses. Testosterone replacement appears to be useful for increasing BMD at the lumbar spine in

hypogonadal men; nonetheless, it has not been found to have a positive effect on BMD at cortical sites, such as the hip or radius. These studies are too small to demonstrate an effect on fracture.

In men with normal gonadal function, the impact of androgen therapy is less understood.

Parathyroid hormone (PTH)

One study showed that 12 months of daily subcutaneous injection of a synthetic PTH, combined with daily supplements of vitamin D in middle-aged men with idiopathic osteoporosis and one or more vertebral fractures, significantly increased BMD at the spine, while no changes occurred at the radius.¹⁷

In a recent, 18-month RCT of idiopathic osteoporotic men, 400 IU of PTH daily, significantly increased lumbar spine BMD by 13.5% and femoral neck BMD by 2.9% as compared with the control group.¹⁸

More information is needed

Although an increasing number of studies are designed at unraveling the prevention and treatment of osteoporosis in men, the field is still relatively new and more data must be collected before solid, evidence-based recommendations can be developed. **Dx**



Take-home message

How is osteoporosis diagnosed in men?

- T-score of < -2.5 establishes the diagnosis of osteoporosis.
- The presence of fragility fracture is the most common clue to make the diagnosis.
- It is important to assess risk factors.

How is osteoporosis treated in men?

- Bisphosphonates have been shown to be the most effective therapy.
- PTH is a promising new therapy.

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A followup on Al

A diagnosis of osteoporotic compression fracture was established. He was started on alendronate, 70 mg weekly, along with calcium and vitamin D.

He was advised to stop smoking and consuming alcohol.

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1. National Osteoporosis Foundation (U.S.):
www.nof.org/men
2. The Osteoporosis Society of Canada:
www.osteoporosis.ca



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