

# Osteoporosis in Men

## *Breaking Down the Risk*

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As presented at McMaster University's  
Grand Medical Rounds (2004)

**B**ecause osteoporosis has been widely regarded as a disease affecting women, it is often overlooked in men; however, it has become an increasingly important health issue in the male population.

As with women, age is associated with increases in both vertebral and hip fracture rates in men.<sup>1</sup> Approximately 30% of hip fractures occur in men, however, the mortality rate in men is approximately two-fold higher.<sup>1,2</sup>

### *What are the risk factors for osteoporosis in men?*

A fracture is often the first sign of osteoporosis. A vertebral fracture is associated with a four-fold increased risk of further vertebral fractures and a two-fold increased risk of hip fractures. It is, therefore, necessary to identify those with osteoporosis at a preclinical stage, prior to the onset of a fracture.

Approximately 45% of osteoporosis cases in men will not have an identifiable cause. In the remaining 55%, a secondary cause of bone loss is identified. Most commonly, osteoporosis in

### T.J.'s case

T.J., 39, is referred by his respirologist for osteoporosis assessment.

He has been treated with intermittent prednisone, receiving two to three courses per year over the past seven to 10 years.

He is a non-smoker, consumes alcohol one to two times per day. Dietary calcium intake is limited to one serving of dairy products daily. He has a history of a fracture of his left wrist due to a fall at age 13.

On exam, you note mild dorsal kyphosis. He is clinically eugonadal.

Current medications include albuterol, ipratropium bromide, and fluticasone propionate inhaler.

- Is T.J. at risk for further fracture?
- Which investigations should be done?
- How should he be treated?

**For a followup on T.J., go to page xx.**



men is secondary to prolonged systemic glucocorticoid therapy, hypogonadism, or alcohol excess.<sup>3</sup> Table 1 lists other secondary causes.<sup>4</sup>

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Table 1

### Risk factors for osteoporosis in men

#### Major risk factors (1 or more)

- Vertebral deformity
- Non-traumatic loss of vertebral height/kyphosis
- Radiographic evidence of osteopenia
- Age > 65
- Hyperparathyroidism
- Hypogonadism
- Systemic glucocorticoids
- Prior fragility fracture after age 40
- Family history of osteoporotic fracture
- Malabsorption
- Propensity to fall

#### Minor risk factors (2 or more)

- Low dietary calcium
- Weight < 57kg
- Cigarette smoking
- Excess alcohol or caffeine intake
- Chronic use of anticonvulsant therapy
- Chronic use of heparin
- Rheumatoid arthritis
- History of clinical hyperthyroidism

### *Which male patients should we test?*

The Osteoporosis Society of Canada (OSC) guidelines recommend individuals with one major risk factor or two or more minor risk factors for fracture should be further evaluated for osteoporosis with exclusion of secondary causes of bone loss.<sup>4</sup>

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Low bone mineral density (BMD) in men may not be associated with the same increased risk of fracture as in women. Current data regarding the BMD-fracture risk relationship in men is contradictory and further clinical trials are necessary to understand this relationship.

### *Can we apply the BMD fracture risk relationship to men?*

The relationship between BMD and fracture risk in men is not well understood and may be different to that in women. Currently, the use of dual energy X-ray absorptiometry (DXA) of the hip and spine is considered the gold standard in the diagnosis of osteoporosis. Even when corrected for differences in weight and size, bone dimensions are greater in men. Thus, DXA measures will tend to overestimate BMD in men, which leads to an underestimate of the prevalence of osteoporosis in this population.

The T-scores we currently use to define BMD were originally calculated based on the male normative reference data.

*Only 30% of all hip fractures occur in men, however, the mortality rate in men is about two-fold higher than in women.*

In men, as the relationship between fracture risk and T-score is less clearly delineated and remains somewhat controversial, a clear consensus on diagnostic criteria has not been reached. A densitometric diagnosis of osteoporosis may be made in older men using the

Table 2

### Lab tests for osteoporosis in men

- Complete blood count
- Serum calcium (total and ionized)
- Serum creatinine
- Liver function tests
- Alkaline phosphatase
- TSH
- PTH and serum 25-hydroxy vitamin D (to exclude the possibility of parathyroid disease and/or vitamin D deficiency)

*Where indicated:*

- Protein electrophoresis in patients > 60; rule out multiple myeloma
- 24-hour urine calcium (to exclude hypercalciuria in the presence of a history of nephrolithiasis, or hypocalciuria in the presence of malabsorption)
- 24-hour urine-free cortisol
- Total and free serum testosterone (to exclude hypogonadism)
- Antibody testing for celiac disease in those who have features of calcium malabsorption

TSH: Thyroid-stimulating hormone  
PTH: Parathyroid hormone

World Health Organization (WHO) classification of osteoporosis (T-score  $\leq -2.5$ ) until prospective data defining the BMD-fracture risk relationship in men are available.

The WHO classification of osteoporosis may also be used in younger men (ages 20 to 65) in the presence of secondary causes of osteoporosis, such as steroid therapy, hypogonadism, or primary hyperparathyroidism, as these conditions may increase fracture risk independent of BMD.<sup>3</sup>

### *How do you investigate osteoporosis in men?*

The clinical assessment of your male patient

### A followup on T.J.

T.J. is at increased risk of fracture.

He has already sustained a fracture with a fall from standing height. He has been on intermittent glucocorticoid therapy and has spinal deformity.

Further investigations include a biochemical profile with exclusion of additional factors contributing to osteoporosis. Spinal X-rays would also be recommended in view of the presence of dorsal kyphosis.

Treatment options include appropriate lifestyle changes with consideration of bisphosphonate therapy in the absence of additional secondary causes of osteoporosis.

with fragility fractures and/or low BMD includes history, physical, and appropriate lab investigations. It is recommended that additional lab tests be ordered to ensure secondary causes of osteoporosis have not been overlooked (Table 2).

### *How is osteoporosis treated in men?*

Due to the multifactorial nature of the disease, the management of osteoporosis can be complex (Table 3).

Following a diagnosis of osteoporosis, the priority of the family physician should be to correct any secondary causes of bone loss, such as:

- hyperthyroidism,
- hyperparathyroidism,
- hypogonadism,
- calcium deficiency,
- vitamin D deficiency, or
- celiac disease.

There is a lack of research data on the effec-

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Table 3

### Treatment options for osteoporosis in men

#### Pharmacologic

- Alendronate, 10 mg/day or 70 mg/week
- Risedronate (for steroid-induced osteoporosis), 5 mg/day or 35 mg/week<sup>6</sup>
- Teriparatide, 20 µg subcutaneously, daily

#### Supplements

- Calcium, 1,000 mg/day (ages 19-50); 1,500 mg/day (age > 50)
- Vitamin D, 400 IU/day (ages 19-50); 800 IU/day (age > 50)

#### Important lifestyle changes

- Smoking cessation
- Reduced alcohol consumption
- Reduced caffeine intake
- Regular walking-type exercise
- Dietary calcium intake

tiveness of medications to treat men with osteoporosis; the only bisphosphonate with current regulatory approval in Canada and the U.S. is alendronate sodium, which has been shown to significantly increase BMD and reduce vertebral fractures in men.<sup>5</sup>

For those male patients with glucocorticoid-induced osteoporosis, alendronate and risedronate have been proven effective in prevention and treatment.<sup>6</sup>

Teriparatide is an anabolic agent also approved for osteoporosis in men. **Dx**

#### References

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## Take-home message



### What is the main sign of osteoporosis in men?

- A fracture is often the first sign of osteoporosis.

### What is the cause?

- Most osteoporosis in men is secondary to prolonged glucocorticoid therapy, hypogonadism, or alcohol excess.

### Who should be tested?

- Men with one major risk factor or two or more minor risk factors for fracture should be evaluated.

### What is the treatment?

- Treatment can include pharmacologic therapy (alendronate, risedronate, teriparatide), supplements (calcium and Vitamin D), and lifestyle modifications (exercise).

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