Osteoporosis in Men: A Silent Theif

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The loss of bone mass and decreased bone strength is characteristic of osteoporosis (OP). Generally OP is pain-free unless a fracture occurs and therefore is considered a silent thief. OP has traditionally been thought of as a disease that affects post-menopausal women; however, in truth OP does not show any sex discrimination. Overall, while one women in four women over the age of 50 will have an OP-related fracture in their remaining lifetime, so will one man in five men. Furthermore, men who do sustain fractures due to OP suffer more severely in terms of morbidity and mortality than do women. Of the 27,000 hip fractures that occur in Canada every year, only 27% occur in men and therefore they are less likely to be evaluated for OP, or to receive antiresorptive therapy after a hip fracture.

Meet Tom

- Tom, 53, has a history of chronic back pain with previous vertebral laminectomies and fusions of T8-9
- He is on oxycodone, but presents with recently increased lower back pain
- He has complained of decreased libido and erections for more than a year
- Tom has a smoking history of 25-packs per year and consumes three beers per day
- He has no family history of osteoporosis (OP)
- Since last year, he has lost 3 cm in height but has no kyphosis or vertebral tenderness
- He has no change in secondary sex characteristics
- Spinal x-rays show evidence of a compression fracture (L1)
- His bone mineral density (BMD) is recorded as:
  - Lumbar 0.773 gm/cm2 T score -3.11
  - Femur 0.785 gm/cm2 T score -1.64

For more on Tom, read on...

Approach to assessment and diagnosis

In 2002, Osteoporosis Canada published the clinical practice guidelines for the diagnosis and management of OP in Canada. While the investigation of diagnosis and management of OP in men has not been as extensive as in women, the following recommendations were supported:

- Bone mineral density (BMD) measurements should to be performed in all men > 65 years
- BMD measurements should be considered in younger men if there are secondary causes for low bone density or other risk factors for fracture
- Men have a higher prevalence of secondary causes than women.
- < 50 years, do not use T-scores for diagnosis
- Z-scores should be used to identify the degree of low bone mass (< -2 warrants further evaluation)

Men being investigated for OP should undergo a complete history and physical examination, including an accurate height measurement. If there is documented height loss, back pain or kyphosis,

x-rays of the thoracic and lumbar spine are indicated to assess for compression factures. Because men have a higher prevalence of secondary causes of OP, laboratory testing should exclude:

- Hyperparathyroidism (Calcium, with Parathyroid Hormone if Ca is high)
- Vitamin D deficiency (25-OH vitamin D)
- Liver and renal disease (creatinine, liver function tests)
- Chronic malabsorption (*ie.,* Celiac disease, antitransglutaminase)
- Malignancy (serum protein electrophoreses)
- Hypogonadism (testosterone, bioavailable/free testosterone, Lutenizing hormone/follicle stimulating hormone)

Osteoporosis is generally pain-free unless a fracture occurs and therefore is considered a silent thief.

Therapeutic options

Calcium and vitamin D intake need to be adequate with recommendations of 1500 mg q.d. of calcium through diet and supplements and at least 800 IU of vitamin D. Suggested lifestyle recommendations include:

- appropriate activity,
- decreased alcohol and caffeine intake and
- smoking cessation.

Additional pharmacologic treatment should be initiated in men who:

- > 65 years
- have aT-score of < -2.5 at the lowest measured site,
- > 50 if there is a fragility fracture, or vertebral compression fracture even with a T-score of -1.5,
- If there's evidence of clinical hypogonadism of any cause in the presence of a T-score < -1.5
- On glucocorticoid therapy > 3 months if T-score is < -1.5.

Tom's Followup

Labratory testing revealed that Tom had:

- low total testosterone 2.0 nmol/L (9.1 to 55),
- low free testosterone 3.2 pmol/L (31 to 125) and
- inappropriately normal LH 2.3 IU/L (2 to 9), FSH 2.5 IU/L (1-18) which raised the question of pituitary dysfunction.

On testing, other pituitary function was normal and there was no evidence of pituitary tumor.

The diagnosis is secondary hypogonadism most likely due to prolonged oxycodone use.

Therapy was initiated with:

- Androgens 100 mg to 200 mg q.d. for two weeks,
- alendronate 70 mg weekly,
- calcium and
- vitamin D supplementation.

Tom was advised to:

- decrease EtOH consumption,
- smoking and to
- consider non-opioid pain medication if possible.

A BMD test is to be repeated in one year to assess adequacy of therapy.

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Table 1
Therapy for OP in men

Treatment	Dosage
Calcium	1500 mg from diet and supplements
Vitamin D3 (cholecalciferol)	800 IU q.d.
Alendronate	70 mg weekly
Risedronate	35 mg weekly
Etidronate cyclical therapy	400 mg q.d. for 14 days (90 day cycle)
Teriparatide subcutaneous injection	20 ug q.d.

Take-home message

1. OP occurs in one man out of five men > 50 years, but it is currently under diagnosed and under treated
2. Morbidity and mortality due to OP related fractures are greater in men
3. Osteoporosis in men is more commonly due to secondary causes
4. Therapy with bisphosphonates will reduce fracture risk in men, teriparatide has been shown to improve BMD
5. Testosterone therapy is only effective in improving BMD in hypogonadal men

Clinical trial data on the therapy of OP in men is limited, with bisphosphonate therapy remaining the primary form of therapy. Alendronate has regulatory approval for use in men and is equally effective in improving BMD in eugonadal and hypogonadal men. Studies have shown risedronate is also effective in reducing vertebral fractures in men and effective for treatment of glucocorticoid-induced OP. Etidronate remains second line therapy. Parathyroid hormone is an anabolic agent that improves BMD in men but no fracture data is currently available.

Testosterone treatment should be considered in men diagnosed with hypogonadism. In men with primary or secondary hypogonadism who have been given physiologic testosterone replacement, their BMD is restored to the age-dependent reference range in all subjects. The greatest increase in BMD occurs in the first year but it takes 24 months to see the full effect of testosterone replacement. There is currently no data on fracture reduction and testosterone therapy is not beneficial in men who are not testosterone deficient.

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