Osteoporosis in Men in Australia – The Forgotten Disease
Submission to Senate Select Committee on Men's Health

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BACKGROUND

What is osteoporosis?

Osteoporosis is a disease usually affecting older women and men. It is a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture. Bone strength is determined by bone mineral density and bone quality. Most bones except those of the face and head can be affected by osteoporosis, but the most common sites of fractures are the hip, spine, wrist and ribs. Osteoporosis is often called the 'silent disease' because it arises without symptoms and is only first recognised when a minimal trauma fracture occurs.

How common and costly is it?

One in three men in Australia over 60 will suffer a fracture due to osteoporosis[1]. One third of hip fractures will occur in men by 2010. In Australia, the estimated direct cost of treating these fractures will be about $300 million per year[2]. The increase in men with hip fractures is due to both an increase in longevity and a "later-born" (secular) increase in fracture incidence.

The risk of dying after hip or other fractures is higher in men than women – and is up to 37.5% in the first year. This shorter lifespan is probably because osteoporosis in men is often present together with other serious illnesses. Younger men may also be affected and nearly 50% of hip fractures in men occur before age the age of 80 years.

It is important to initiate treatment in men who present with hip and other fractures, as 20% of men will have a second hip fracture.

Spinal fractures are also important. Spinal fracture rates in men aged older than 65 years are about half those in women, however, the majority (>70%) are painless but are associated with height loss, reduced quality of life and respiratory dysfunction. The risk of dying is also increased after spinal and most other major and minor fractures in men[3].

How does osteoporosis happen?

Osteoporosis happens when bones lose minerals, such as calcium, more quickly than the body can replace them (increased bone turnover) leading to a loss of bone mass or density. As a result, bones become thinner, so that even minor trauma can result in serious fractures.

Do all men have a higher risk of developing osteoporosis as they age?

In men and women over the age of 65, the intestine cannot absorb calcium from food as well. A hormone known as the parathyroid hormone from the

parathyroid glands is produced at a higher rate and makes the bone release its calcium into the blood stream. This hormone increases in production with age and makes the bones lose more calcium to become thinner. Taking calcium tablets may help older men reduce bone loss and their risk of fractures.

At what age in men does bone mass begin to fall?
In most people, bone mass starts to fall after about the age of 30. When bone mass begins to fall, it is more gradual in men than women. Women generally have less bone mass than men and women's bones lose calcium and other minerals at a much faster rate after menopause due to a decrease in their oestrogen levels.

What causes osteoporosis in men?
Testosterone, the male sex hormone, is important for the normal health of a range of body functions including the development and maintenance of bone mass. Testosterone levels gradually decline in men with ageing. In some men, low testosterone levels may cause bone thinning, a decrease of muscle mass and increase the rate of bone turnover so bones become less solid. Men with proven low blood testosterone levels (testosterone deficiency) are therefore more likely to have bone fractures compared to men with normal testosterone levels. However, low testosterone levels are not the only cause of osteoporosis in men, and a range of factors including genetic factors, can have a strong influence on bone mass.

What other hormones can cause osteoporosis?
The female hormone oestrogen is present in much lower amounts in men than in women, but is important to a man's health. In men and women, oestrogen controls bone turnover and in men may be important for peak bone mass. Peak bone mass is when bones are at their strongest; normally in men at about 20-30 years of age. Lack of oestrogen in men is likely to reduce bone formation, which leads to a decrease in bone mass. This can still happen in men with normal levels of testosterone.

Can trauma and excessive exercise cause osteoporosis in men?
Some osteoporosis in men is related to excessive exercise and poor nutrition, which results in low levels of male sex hormones. Too much exercise can also put bones under a high level of stress, causing bones to fracture easily. However, for most men regular physical activity has been found to help reduce the risk of fractures when they are older by improving muscle mass, balance and bone strength [4].

What are the major risk factors that can lead to osteoporosis in men?
Some men are more likely to develop osteoporosis than others. Lifestyle factors that may increase the rate of bone loss include low levels of physical activity, smoking, excessive alcohol intake (> 2 standard drinks per day), poor calcium levels and vitamin D deficiency. Other factors that may lead to osteoporosis include if a man has had a previous fall or fracture, age, a family history of fractures and being underweight. Some medications such as corticosteroids (often used for asthma, arthritis and kidney disease) and

anticonvulsants, commonly used to treat epilepsy and some psychiatric disorders, can also speed up the first signs of osteoporosis.

Can osteoporosis be prevented?
If osteoporosis is diagnosed early and effective treatments are used, bone loss can be prevented from getting worse. Having a healthy lifestyle by not smoking, limiting alcohol intake and being active are some of the ways men can reduce their risk of osteoporosis. Weight-bearing and resistance exercises, such as walking, jogging and lifting weights will help improve muscle tone and help maintain bone mass.

Getting enough calcium and vitamin D each day is also important to keep bones healthy. Men can get enough calcium by eating 3-4 serves of dairy foods such as milk, yoghurt and cheese daily or by taking calcium tablets. Vitamin D can be taken in tablets or absorbed through sunlight. A balance is required between achieving enough sun exposure to maintain adequate vitamin D levels and avoiding an increased risk of skin cancer. As little as ten minutes of sunlight per day outside peak exposure times (UV index <3) may be recommended to maintain vitamin D levels.

What are the effects of osteoporosis on a man's quality of life?
Osteoporosis can have a major effect on quality of life. It can cause a man pain, disability, depression and loss of independence and subsequent social isolation. For men with hip fractures and other illnesses, life expectancy may be reduced. When bone fractures happen, there may be a loss of height or curvature of the spine that can impair lung functioning and normal breathing.

How is osteoporosis diagnosed?
Osteoporosis is diagnosed by examining a man's medical history, taking his height measurement and some specific tests, such as a DXA (Dual-energy X-ray Absorptiometry) scan. The DXA scan, commonly known as a bone density test, measures the density of a man's bones compared with the bone density of an average young adult of the same gender and ethnicity. The DXA scan uses a small amount of radiation to measure the density of the bones in the spine and hip. The test gives a 'T score', which tells the doctor whether or not bone loss has occurred. The patient's bone density is then classified into three categories based on the T score: normal, low bone density, or osteoporosis. Osteoporosis may also be described as severe osteoporosis based on the T score in combination with fracture.

Classification	**T score**
Normal bone density	Greater than -1.0
Osteopenia (low bone density)	Between -1.0 & -2.5
Osteoporosis	-2.5 or less
Severe Osteoporosis	-2.5 or less with a fragility fracture

What do the results of a bone mineral density test mean?
A man who has a T score of -2.5 or less has osteoporosis and is at high risk of getting a fracture. If a man has this score after having a bone density test then he should talk to his doctor about treatment for osteoporosis. A score

between -1.0 and -2.5 shows osteopenia or low bone density. This may mean that some lifestyle changes are needed to reduce the risk of developing further bone loss and/or the risk of fracture. In addition to the bone density T score, other risk factors are also important (see below). Recently, internet-based algorithms, which incorporate some of these clinical risk factors, have become available to determine a man's absolute fracture risk (FRAX, Garvan Institute Fracture Risk Calculator).

Should all men have a bone density test[5]?

Men should have a bone density test if they have:

- Previously been diagnosed with osteoporosis
- Symptoms that suggest osteoporosis, such as loss of height > 3 cm or past fractures on minimal trauma
- Men with low vitamin D levels or from groups at high risk of vitamin D deficiency
- Rheumatoid arthritis
- Chronic kidney and liver disease
- Overactivity of thyroid or parathyroid glands
- Been prescribed corticosteroids, a drug usually given to treat arthritis, asthma, or kidney diseases for > 3 months
- Been taking certain anti-convulsive drugs
- Testosterone deficiency
- A family history of osteoporosis
- An age ≥ 70 years
- Smoke or overuse alcohol
- A low body mass index (<20)
- Inflammatory forms of arthritis
- Malabsorption from the intestines
- High urine calcium levels

Can osteoporosis be treated?

If a man has had fractures or is diagnosed with osteoporosis, there are medications that may stop further bone loss or even improve bone mass, and also prevent further fractures. The most common medication used to treat osteoporosis in men is a bisphosphonate, a non-hormonal drug, which can help increase bone mass and reduce the risk of fractures. Bisphosphonates may be given as tablets once per week or as an intravenous injection once a year. A drug known as teriparatide (parathyroid hormone), that helps new bone to grow and increases bone mass, can also be given by daily subcutaneous injections. However, currently this treatment is reserved for use in men with severe osteoporosis.

Treatment Reimbursement in Australia

The Government reimburses treatment for osteoporosis with a bisphosphonate in: a) men with a previous minimal trauma fracture (this includes spinal fractures); b) men aged 70 years or older with a bone density T score of -3 or less; c) men with a hip fracture aged older than 50 years (only indication for reimbursement of intravenous bisphosphonate). Teriparatide is likely to be reimbursed in the near future for men with severe osteoporosis, while risedronate also will be reimbursed to prevent

corticosteroid-induced osteoporosis in men with low bone density (T score < -1.5) receiving moderate doses of corticosteroids for longer than 3 months.

Can testosterone therapy reduce the risk of osteoporosis?
Replacing testosterone in men who have symptoms of testosterone deficiency and clearly low testosterone levels can improve bone density[6]. It is also possible it would reduce fractures, but clear evidence from trials is lacking. There is no evidence that testosterone replacement therapy improves bone density in men with normal levels of testosterone. Testosterone deficiency is treated by giving testosterone in doses that return the testosterone levels in the blood to normal. The available forms of testosterone therapy are injections, implants, skin patches, oral capsules, gels and creams. Testosterone therapy is not recommended for men who do not have proven (clinically confirmed) testosterone deficiency.

How important is it for men to maintain good bone health?

Most men and some doctors still do not realise that osteoporosis can affect men as well as women and it is not just a disease of older people.

Often the only time a man realises he may have osteoporosis is when he breaks a bone. Having a healthy lifestyle including an adequate calcium in the diet and normal vitamin D levels, and increasing weight-bearing exercise, and paying attention to bone health from childhood throughout life is the best way for men to maintain bone mass and reduce their risk of osteoporosis. Such a healthy lifestyle is likely to also reduce the risk of other chronic diseases, such as diabetes, hypertension and obesity.

INADEQUATE RESOURCES FOR OSTEOPOROSIS IN MEN IN AUSTRALIA

Specific Issues included in Senate Select Committee's Inquiry into Men's Health

1. Level of Commonwealth, state and other funding addressing men's health.

The availability of and effectiveness of education, support and services for men's health relating to osteoporosis in men are extremely limited. Osteoporosis Australia is the peak body co-ordinating awareness and education programmes regarding osteoporosis in Australia. However, until very recently there has been no targeted funding of such awareness and education campaigns for osteoporosis in men. The current amount ($80,000) will not allow a sustained education and awareness campaign on osteoporosis in men. Osteoporosis Australia is supported in its activities by the peak scientific society in Australia relating to bone and mineral metabolism, the Australian and New Zealand Bone and Mineral Society (ANZBMS), and the ANZBMS President sits on the Osteoporosis Australia Board.

2. Adequacy of existing education and awareness campaigns regarding osteoporosis in men for both men and the wider community.

The current limited existing education and awareness campaigns run by both Osteoporosis Australia and last year through Osteoporosis Australia's partnership with Andrology Australia have been inadequate both for men and for health care professionals.

Evidence for this is presented below:

i. Most men and some doctors still do not realise that osteoporosis can affect men as well as women and it is not just a disease of older people.
ii. A population-based study of 1705 Australian men aged > 70 years showed about 25% met one or more of the criteria listed above for osteoporosis treatment with bisphosphonates (ie either minimal trauma fracture, vertebral fracture or bone density T score of -3 or less). Only 9% of these men were on treatment including a bisphosphonate, while a further 17% were on either calcium or vitamin D alone. This suggests about 25% of Australian men aged > 70 years will be eligible for specific osteoporosis treatment. However, it is apparent osteoporosis is markedly under-diagnosed and under-treated in older Australian men[7].
iii. Age-standardised rates of bone density testing use, by sex and by metropolitan, rural or remote (RRMA) classification were measured in a recent study. Rates were lower for rural and remote populations, with people in capital cities about three times as likely to undergo the investigation as those in remote areas. In addition, the sex ratio for the rate of bone densitometry use (women to men) decreased from more than 6:1 in 2001 to 4:1 in 2005. These data suggest the use of bone density testing is lower in men than women and that both sex and rural inequities in bone density testing need to be addressed in any new education and awareness campaigns[8].
iv. Recent data from the Australian Institute of Health and Welfare show a decline in the age-related incidence of hip fractures in women by 14.5% from 1998-99 to 2005-06, while this decline was far less in men. Once again, this may imply men are not receiving osteoporosis education as well as women, and education and awareness campaigns regarding osteoporosis in men need to be increased[9].

Funding for better education of male patients and doctors about osteoporosis in men is needed so that diagnosis and treatment rates for men with osteoporosis improve substantially, just as they have improved over the last decade in women.

Evidence-practice gap in osteoporosis in men[10]

Another area where men through osteoporosis "fall through the gap" is in initiation of specific osteoporosis therapy after a minimal trauma fracture. The rates are very low, between 20-30%. Part of the reason for this is a lack of communication between hospitals and general practitioners. There also needs to be co-operation between the Commonwealth and state governments to overcome this evidence-treatment gap. Osteoporosis Australia held a "Fracture Think Tank" sponsored by the Commonwealth government in

December 2008 to find solutions to this problem. A nation-wide approach with Fracture Liaison nurses identifying men (and women) with minimal trauma fractures in hospitals and communicating with general practitioners could help solve the problem. Such nurses could be physically located in Divisions of General Practice.

3. Prevailing attitudes of men towards their bone health and sense of well-being and how these are affecting men's health in general.

Most men and some doctors still do not realise that osteoporosis can affect men as well as women and it is not just a disease of older people. This is part of a larger negative attitude to health concerns, in general, in men. Several adverse health behaviours such as smoking and excessive alcohol use have a negative impact on bone health and need to be specifically addressed in education and awareness campaigns regarding osteoporosis in men.

4. The extent, funding and adequacy for treatment services and general support programs for men's health in metropolitan, rural, regional and remote areas.

Treatment services and general support programs for men's health in metropolitan, rural, regional and remote areas relating to osteoporosis in men are poorly developed. There has been demonstrable poor uptake of the diagnostic test, bone density testing, by men. This has been even more pronounced in rural and remote areas. In addition, the uptake of treatment has been very poor and only a minority of men eligible for specific anti-osteoporosis therapy are actually receiving it. No widespread support programs have specifically designed for osteoporosis in men. Such programs need to emphasise the importance of calcium, vitamin D and high-impact exercise, and avoidance of negative health behaviours such as smoking and excessive alcohol in the prevention of osteoporosis in men. Osteoporosis Australia, together with its state offices, is well positioned to design and implement general support programs for osteoporosis in men.

Although the current data suggest men with osteoporosis are not accessing specific treatment although they are eligible, eligibility criteria for both diagnostic testing and treatment reimbursement need to be reconsidered. In particular, a decrease in the age for diagnostic testing from 70 years to 56 years or 60 years should be considered, as should the eligibility criteria for treatment of men with low bone density without fractures. Regarding the latter, the current cut-off of age 70 years or more and T score of -3 or less is restrictive and the age criteria could be reduced to 60 years or 65 years and retain a degree of cost-effectiveness.

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