



OSTEOPOROSIS: THE EMERGING SILENT KILLER

KEYWORDS

osteoporosis, BMD, DXA

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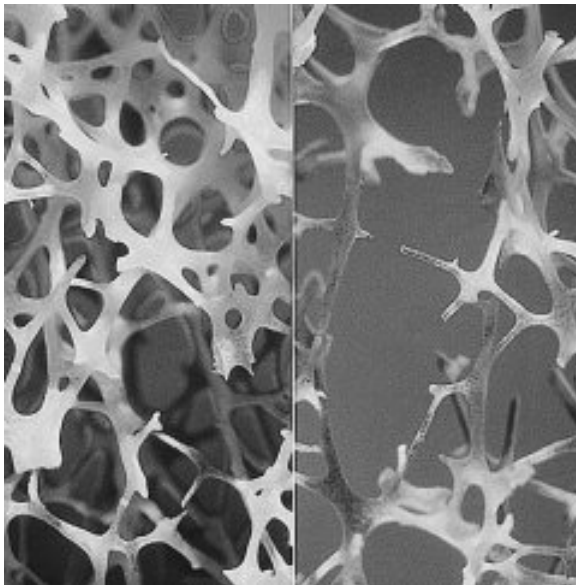
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ABSTRACT Osteoporosis is a global problem which is increasing in significance as the population of the world both groups and ages. Osteoporosis is often called the "silent disease" in which the density and quality of bone are reduced, leading to weakness of the skeleton and increased risk of fracture, particularly of the spine, wrist and hip. Osteoporosis and associated fractures are an important cause of mortality and morbidity. According to World Health Organization (WHO), osteoporosis is second only to cardiovascular disease as a global healthcare problem. Since osteoporosis affects the elderly population which is growing, it will put a bigger burden to the healthcare system as treatment is expensive. This disease can be easily prevented by lifestyle modification, by diagnosing of osteoporosis at early onset by BMD Test through DXA. We can prevent the patient from complication of osteoporosis through proper medication at early stage and can prevent the patient from surgical intervention.

INTRODUCTION

Osteoporosis is defined by the World Health Organization (WHO) as a bone mineral density of 2.5 standard deviations or more below the mean peak bone mass (average of young, healthy adults) as measured by dual-energy X-ray absorptiometry;

Osteoporosis, which literally means porous bone, is a disease in which the density and quality of bone are reduced. As bones become more porous and fragile, the risk of fracture is greatly increased. The loss of bone occurs silently and progressively. Often there are no symptoms until the first fracture occurs.



Left: normal bone, right: osteoporotic bone

Due to its prevalence worldwide, osteoporosis is considered a serious public health concern. Currently it is estimated that over 200 million people worldwide suffer from this disease¹. Approximately 30% of all postmenopausal women have osteoporosis in the United States and in Europe. At least 40% of these women² and 15-30% of

men³ will sustain one or more fragility fractures in their remaining lifetime. Ageing of populations worldwide will be responsible for a major increase in the incidence of osteoporosis in postmenopausal women⁴.

As well, the combined lifetime risk of hip, forearm and vertebral fractures coming to clinical attention is around 40%, which is equivalent to the risk of cardiovascular diseases⁵.

1 out of 8 males and 1 out of 3 females in India suffers from osteoporosis, making India one of the largest affected countries in the world⁶. In most Western countries, while the peak incidence of osteoporosis occurs at about 70-80 years of age, in India it may afflict those 10-20 years younger, at age 50-60⁷.

In women over 45 years of age, osteoporosis accounts for more days in hospital than may other diseases, including diabetes, myocardial infarction and breast cancer⁸.

Osteoporosis itself has no symptoms; the density and quality of bone are reduced, its main consequence is the increased risk of bone fractures. Typical fragility fractures occur in the vertebral column, rib, hip and wrist. A DXA scan, which is used to measure spine and hip bone density, is the most common technique for assessing the risk of osteoporosis.

Dual-energy X-ray absorptiometry (DXA) is considered the gold standard for the diagnosis of osteoporosis

Category	T-score range	% young women
Normal	T-score ≥ -1.0	85%
Osteopenia	$-2.5 < \text{T-score} < -1.0$	14%
Osteoporosis	T-score ≤ -2.5	0.6%
Severe osteoporosis	T-score ≤ -2.5 with fragility fracture	

Risk factors for osteoporosis

Fixed risks

Fixed risk factors include⁹⁻¹⁰

- Age, female gender, ethnicity
- Family history of osteoporosis ,previous fracture
- Post Menopause/hysterectomy
- Long term glucocorticoid therapy
- Chronic conditions like ,Rheumatoid arthritis ,COPD ,Diabeties Mellitus ,Chronic renal failiure

Modifiable risks

These include¹¹⁻¹²

- Alcohol, Tobacco smoking
- Low body mass index
- Poor nutrition, eating disorders(anorexia nervosa and bulimia)
- Low dietary calcium intake, Vit D deficiency
- Insufficient exercise, frequent falls

Fracture risks can be lowered by preventive lifestyle measures against osteoporosis and drug treatments also have a preventive role against bone loss.

The lifestyle measures that help to maintain a healthy bone mineral density and prevent fractures, are:

1. Get enough calcium (about 1,000-1,200 mg a day, with a higher amount needed by women over 50 and everyone over 70). Calcium is available in the diet or through supplements
2. Get enough vitamin D (doctors can help monitor this; sunshine enables vitamin D production, so preventing being housebound helps; it is available from egg yolks, salt-water fish, and liver; the daily recommended amount is 600 international units, and 800 IU in men and women over 70) commendations of Adequate Intake of Vitamin D from the Institute of Medicine, 2011
 - i. Men/women [18-70] 600 IU/day
 - ii. Men/women [71 and older] 800 IU/day

(Institute of Medicine, 2011 [Reference])
3. Stop smoking and Drinking alcohol.
4. Exercise - weight-bearing exercise, including simple walking and yoga.

The drug choices available to prevent and treat osteoporosis include:

- Bisphosphonates - antiresorptive drugs that slow down bone loss and reduce fracture risk.
- Estrogen agonists/antagonists (also known as selective estrogen-receptor modulators, SERMS) - for example, raloxifene (Evista) is approved for use in postmenopausal women, for whom it can cut the risk of spine fractures.
- Calcitonin (Calcimar, Miacalcin) - also used in postmenopausal women and can prevent spinal fractures, but can also manage pain if fracture occurs.
- Parathyroid hormone - for example, teriparatide (Forteo), approved for people with a high risk of fracture, it stimulates bone formation.
- Estrogen therapy
- RANK ligand (RANKL) inhibitor - denosumab (Xgeva) is an immune therapy and a new type of treatment in osteoporosis.
- Combination Therapy- Estrogen and bisphosphonates-To date there have been no combination therapy studies that have shown a fracture benefit over and above a Single-agent therapy versus single agent therapy. Therefore, it is unknown at this time whether combination Therapy reduces the incidence of fractures¹³⁻¹⁵. Combination therapy should be considered in cases of significant bone loss on a single Antiresorptive agent once other causes of such bone loss have been eliminated or if the pretreatment fracture Risk is quite high.

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