Bone Health and Parkinson's Disease

Parkinson's Society of British Columbia
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Overview

- Introduction to Osteoporosis
- Effects of Osteoporosis on General Health and Quality of Life
- Connection between Parkinson's Disease and Osteoporosis
- Effects of Dopamine-based medications on bone health
- Treatment options for Osteoporosis in Parkinson's Disease
- Questions

What is Osteoporosis

- Osteoporosis is a metabolic bone disease characterized by low bone density and an increased risk of fracture
- It leads to increased fracture risk in all bones, but in particular fractures that greatly alter health and quality of life including hip, femur (thigh), humerus (arm) and vertebrae (back).
- Canadian Census data shows that over 2.2million or 12% of the population over the age of 40 suffers from Osteoporosis

How is Osteoporosis Diagnosed

Osteoporosis is diagnosed in one of two ways

1. History of a fragility fracture

   A fracture that occurs after non-traumatic movement such as bending, lifting or turning, falling from standing height.

How is Osteoporosis Diagnosed

2. Bone Density of less than 2.5 standard deviations below normal

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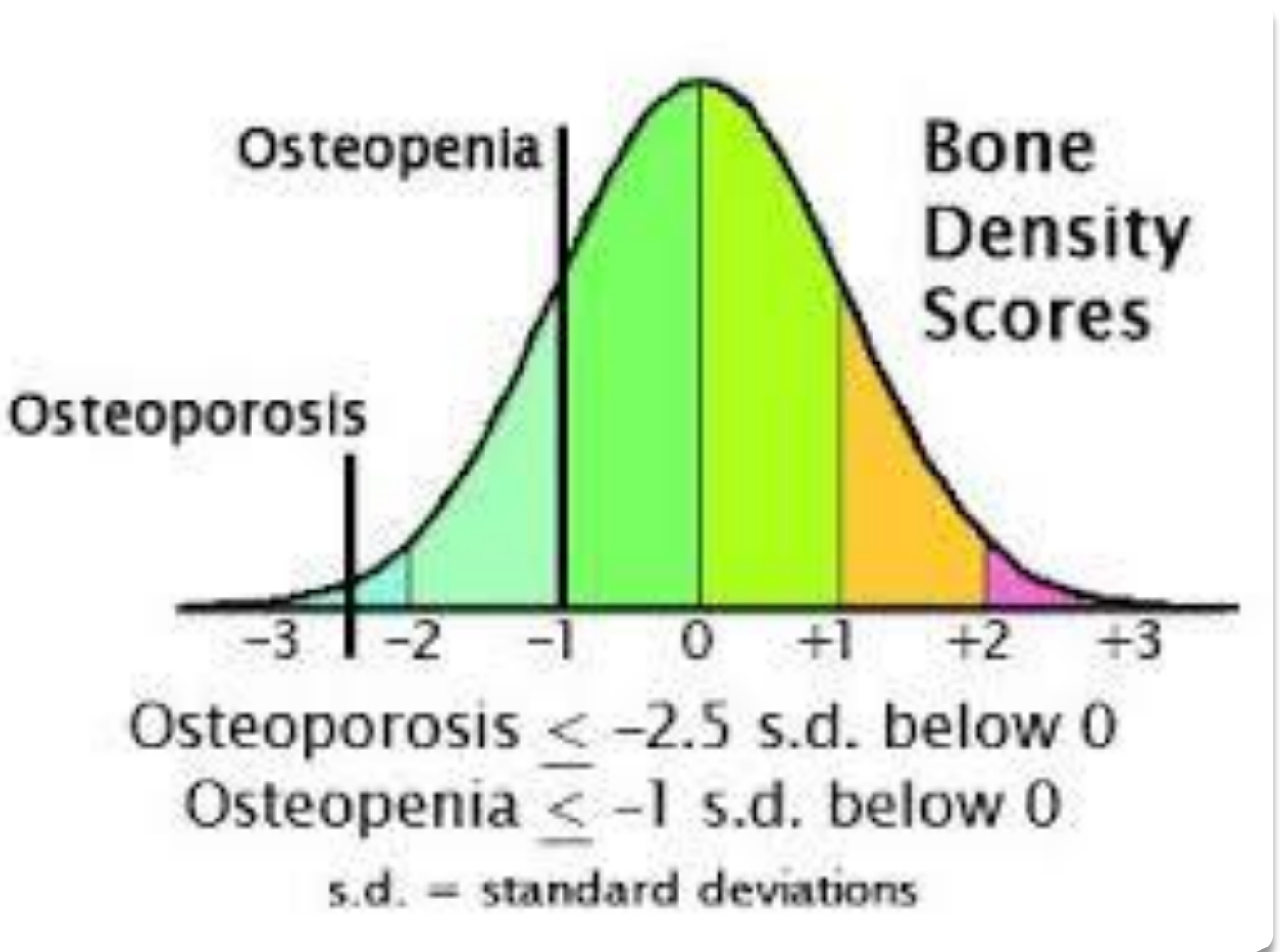


Risk Factors for Osteoporotic Fracture

- Age greater than 65 years
- History of previous Fragility fracture
- Prolonged use of glucocorticoids(steroids) or other high-risk medication
- Parental hip fracture
- Vertebral fracture or osteopenia identified on radiography
- Excessive alcohol intake
- Smoking
- Low body weight (< 60 kg) or major weight loss (> 10% of body weight at age 25)
- Rheumatoid arthritis
- Other disorders strongly associated with osteoporosis

Who should have a Bone Mineral Density?

Table 1: Indications for measuring bone mineral density

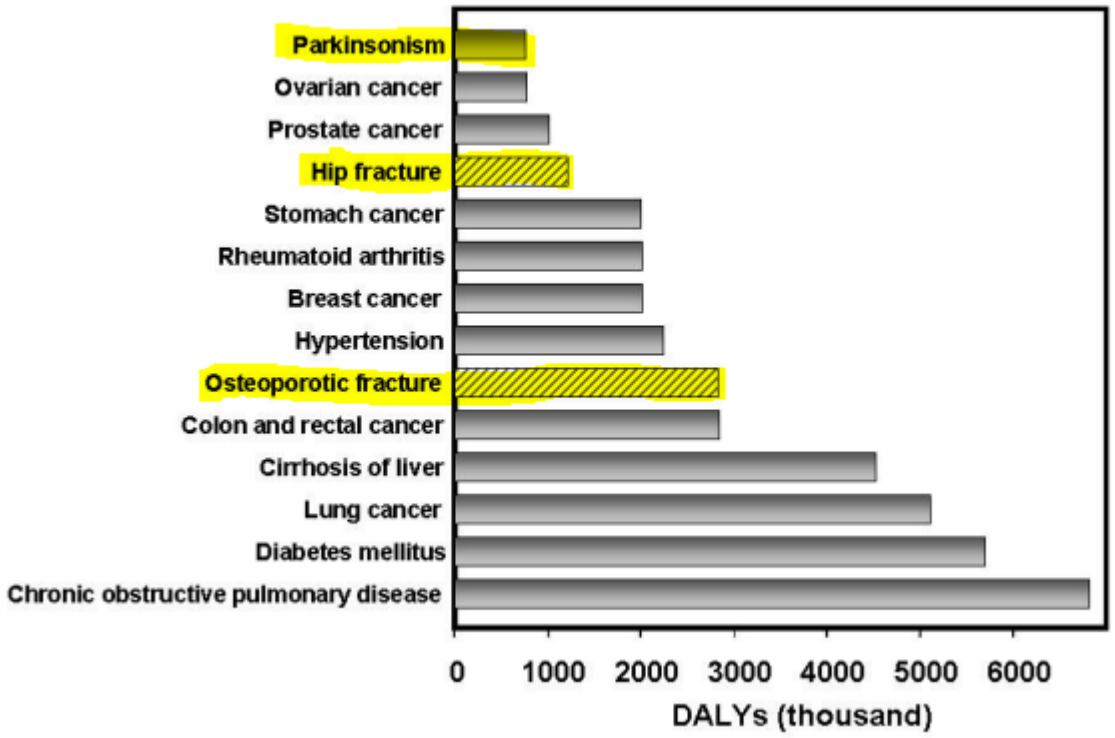
Older adults (age ≥ 50 yr)	Younger adults (age < 50 yr)
Age ≥ 65 yr (both women and men)	Fragility fracture
Clinical risk factors for fracture (menopausal women, men age 50–64 yr)	Prolonged use of glucocorticoids*
Fragility fracture after age 40 yr	Use of other high-risk medications†
Prolonged use of glucocorticoids*	Hypogonadism or premature menopause (age < 45 yr)
Use of other high-risk medications†	Malabsorption syndrome
Parental hip fracture	Primary hyperparathyroidism
Vertebral fracture or osteopenia identified on radiography	Other disorders strongly associated with rapid bone loss and/or fracture
Current smoking	
High alcohol intake	
Low body weight (< 60 kg) or major weight loss (> 10% of body weight at age 25 yr)	
Rheumatoid arthritis	
Other disorders strongly associated with osteoporosis	

*At least three months cumulative therapy in the previous year at a prednisone-equivalent dose ≥ 7.5 mg daily.
†For example, aromatase inhibitors or androgen deprivation therapy.

2010 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary.

Effects of Osteoporosis on Health and Quality of life

Figure 1: Burden of diseases estimated as disability-adjusted life years (DALYs) in 2002 in the Americas and Europe combined



WHO SCIENTIFIC GROUP ON THE ASSESSMENT OF OSTEOPOROSIS AT PRIMARY HEALTH CARE LEVEL Summary Meeting Report Brussels, Belgium, 5-7 May 2004

Osteoporotic Fractures have a greater negative effect on Quality of Life than Parkinsonism when assessed individually. The effect is additive when you have both.

Disability Life Adjusted Years (DALY)= The disability-adjusted life year is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.

Effects of Osteoporosis on Health and Quality of life

Immediate consequences of any fracture is pain and debility.

Long-term effects of fractures include: long term disability, need for a gait aide, chronic pain, altered posture and decreased exercise ability.

Mortality rate also increases with osteoporosis. With hip fracture the one year mortality rate is 25%.

Osteoporosis and Parkinson's Disease

Parkinson's Disease itself and its common treatment options can increase the incidence of Osteoporosis

Invernizzi et al found in their review that 91% of women and 61%of men with Parkinson's Disease also had Osteoporosis.

Other studies have shown that those with Parkinson's Disease have a 2.66 times higher risk of a fracture than those without Parkinson's Disease

The increased risk of fracture with Parkinson's disease is not tied to course of disease with those diagnosed with Parkinson's Disease within the last five years having similar BMD to those diagnosed greater than 5 years ago

Osteoporosis and Parkinson's Disease

Factors that increase fracture risk include:

- Increased risk of falls. Estimates show that 90% of fractures are due to a fall and 68% of those with Parkinson's Disease will have at least one fall per year.
- Lewy Body development in the brain is theorized to affect hormonal release including estrogen and growth hormone
- Vitamin D deficiency increases due to lifestyle changes and dietary changes
- Decreased physical activity, especially resistance exercises
- Change in nutrition and weight loss

Sinemet and Osteoporosis

- Use of dopaminergic medications such as Sinemet can increase homocysteine levels and lower bone formation
- This should be considered and steps taken to protect bone

- It is crucial to realize that Sinemet is also very helpful and the risk to bone health should not be a reason to not take Sinemet.
  - Ongong FDA trials have shown that of 23,795 who have reported side effects to Sinemet, only 112 of them have reported Osteoporosis as a side effect. That is less than 0.5%.

Treatment for Osteoporosis

- Osteoporosis treatment is a two-pronged approach: Lifestyle changes and Medications

- Lifestyle changes focus on minimizing the risk of falls and include incorporating resistance exercises into daily life. Weight bearing exercises such as walking, using resistance bands, Tai Chi and classes such as OsteoFit are suggested.
- Minimizing environmental causes of falls is also suggested including walking in well lit areas, avoiding the use of bifocals or progressive lenses, using gait aides if suggested by a professional (physio or OT)

Treatment for Osteoporosis

- Medications are also suggested for all with Osteoporosis

- Vitamin D supplements should be started for everyone with low bone density or a fragility fracture. The common starting dose is 1000 units a day. Vitamin D can be taken in different forms such as tablets, pills, gummies or drops.

- Calcium supplements are suggested for those with less than 1500mg of calcium intake from their diet. It is not recommended to take extra calcium as there can be increased risk of heart disease and kidney stones with excess calcium

Medication options for Osteoporosis

- Medications that target bone turnover and balance towards bone deposition rather than break down are also suggested for all with Osteoporosis
- You physician will discuss with you what your best options are for treatment
- Classes of medications include
  - Bisphosphonates- Alendronate, Risedronate
  - Antiresportive Agents – Prolia (Denosumab)
  - Anabolic Agents- Forteo (teraparatide), Tymlos (Abaloparitide), Evenity (Romosozumab)

Specialized Osteoporosis Clinics

- There are specialized Osteoporosis Clinics across British Columbia. It is strongly recommended that anyone with concerns be reviewed by an Osteoporosis Specialist who may be a Geriatrician, General Internist with extra training, Rheumatologist or Endocrinologist.

https://pacificgeriatricians.com/osteoporosis-clinic/

Osteoporosis Clinic
Pacific Internists Group Inc.

Pacific Geriatricians Group Inc.

Osteoporosis Referral Form (pdf)

Summary

- Osteoporosis is defined as history of a fragility fracture or a bone density less than -2.5 standard deviation below normal
- Osteoporosis is a common disease and all over the age of 65 years or younger with other medical concerns should be screened with a bone density.
- Parkinson's Disease increases the risk of Osteoporosis with effects from the disease itself and treatment with dopaminergic medications. All those with Parkinson's Disease should be screened for Osteoporosis.
- The increased risk of osteoporosis in itself is NOT a reason to avoid Sinemet treatment
- Treatment for Parkinson's Disease and Osteoporosis focuses on reducing risk of Falls, lifestyle changes including resistance exercises, supplements of vitamin D and Calcium and prescription medications.
- There are specialized clinics for Osteoporosis and it is suggested that one be under the care of a specialists for bone health.

Questions

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