Care of Older Adults

CRANLEIGH MEDICAL PRACTICE

Case Presentation – Mr X

- 70 year old gentleman was admitted with severe back pain
- BG:
  - Malignant Melanoma treated with immunotherapy
  - Hepatitis secondary to immunotherapy treated with high dose steroids and mycophenolate
  - Osteoporosis secondary to steroid use

- MRI spine demonstrated vertebral fractures at several levels throughout the thoracic and lumbar spine
- Admitted for pain control – commenced on 4 hourly immediate release morphine with additional morphine PRN
- Received one dose of Zolendronic Acid and an outpatient DEXA scan arranged

Frailty

- A distinctive health state related to the ageing process in which multiple body systems gradually lose their in-built reserves
- Around 10 per cent of people aged over 65 years have frailty, rising to between a quarter and a half of those aged over 85
- Even simple events can have unforeseen and adverse outcomes
- Cumulative Deficit Model which looks at accumulating deficits which can occur with aging 'frailty markers' which combine to increase the 'frailty index' which in turn increases the risk of adverse outcome.
- Mr X had several frailty markers. He was assessed by the wider MDT and treated very holistically

Osteoporosis

A progressive skeletal disease characterised by **reduced bone mass** and **micro-architectural deterioration of bone tissue**

This leads to an **increase in bone fragility** and **susceptibility to fracture**

Bone Remodeling

- Daily resorption is balanced against deposition of new minerals
- Osteoclasts are responsible for bone resorption
- Osteoblasts are responsible for laying down new bone mineral
- The balance between the activities of these two cell types governs whether bone is made, maintained or lost
- Peak bone mass is reached in early adulthood

Why is it important?

Osteoporotic fragility fractures are fractures that result from mechanical forces that would not ordinarily result in fracture.

In the UK, approximately 536,000 new fragility fractures occur each year

Hip and vertebral fractures are associated with decreased life expectancy.

Hip fractures are fatal in 20% of cases and lead to permanently disables 50% of those affected

Vertebral fractures are often undiagnosed. They are associated with long-term pain and disability.

Osteoporotic fractures in general cause severe pain and disability to individuals who sustain them, at an annual cost to the NHS of over £1.73 billion

DXA

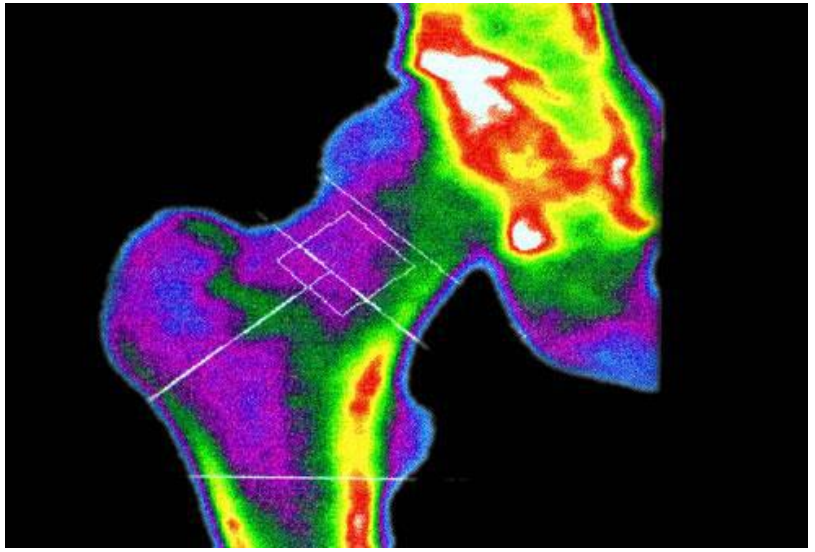
2 uses:

1) diagnosis osteoporsis

2) the assessment of BMD provides information on the likely hood of future fractures

Hip Bone Mineral Density Categories:

Normal: T score greater than or equal to -1
Osteopenia: T score less than -1 but above -2.5
Osteoporosis: T score less than or equal to -2.5
Severe Osteoporosis: T score less than -2.5 plus a fracture



Additional clinical risk factors that provide information on fracture risk independently of BMD

- Age
- Low BMI
- Prior fracture at a site characteristic for osteoporosis
- parental history of hip fracture
- Smoking
- Glucocorticoids increase fracture risk in a dose-dependent manner
- Alcohol
- Rheumatoid arthritis

Assessing fracture risk

- 2 algorithms that integrate the weight of clinical risk factors for fracture risk, with or without information on BMD

- FRAX tool – computes 10 year risk of hip or other major osteoporotic fracture

- Qfracture – UK based study which doesn't incorporate data on BMD. Calculates 1-10 year cumulative incidence of hip or other major osteoporotic fracture

- NICE recommends the use of one of these should be considered in all women age 65 years or older and men age 75 years or older

Managing fragility fracture risk scores

High risk of fragility fracture

DXA scan and offer drug treatment if T score is – 2.5 or less

If T score is greater than – 2.5 modify risk factors and repeat DXA in 2 years

Intermediate risk of fragility fracture

DXA scan and offer drug treatment if T score is – 2.5 or less

Low risk of fragility fracture

Offer lifestyle advise and follow up within 5 years

Lifestyle measure to improve bone health

- Stop smoking
- Reduce alcohol intake to less than or equal to 2 units per day
- Ensure adequate dietary calcium intake
- *Recommended daily calcium intake is 700 to 1200mg daily*
- Check vitamin D status
  - *Recommended nutritional intake of Vitamin D is 400 IU for all adults*
  - *Post menopausal women and men over 50 who are at increased risk of fracture should have 800 IU of cholecalciferol daily*
- Encourage weight bearing exercise

Pharmacological interventions

Bisphosphates – inhibit bone resorption

Oral bisphosphonates:

- Alendronate - treatment of postmenopausal osteoporosis (10 mg daily or 70 mg once weekly) and osteoporosis in men (10 mg daily). Also approved for the prevention of postmenopausal osteoporosis and for prevention and treatment of glucocorticoid-induced osteoporosis (5 mg daily)

- Risedronate - 5 mg daily or 35 mg once weekly by mouth is approved for the **treatment** of postmenopausal osteoporosis and treatment of osteoporosis in men at high risk of fractures. Risedronate 5 mg daily is approved for the prevention of glucocorticoid-induced osteoporosis in postmenopausal women.

- Side Effects of oral bisphosphates include upper GI symptoms, bowel disturbance, headache and musculoskeletal pain

- Oral bisphonates should be taken first thing in the morning, at least 30 minutes before food, other medication or drink (except water)

- Tablets should be swallowed whole with a glass of water while sitting or standing

- Patients can not lie down for at least half an hour after taking them

IV bisphosphonate:

- Zolendronic Acid – 5mg given intravenously once a year

- Approved for the treatment of osteoporosis in postmenopausal women and men at increased risk of fracture, and for the treatment of osteoporosis associated with long-term systemic glucocorticoid therapy.

- Side-effects include an acute phase reaction (flu like illness) and gastrointestinal symptoms

Contraindications to bisphosphonates:

- Hypocalcemia
- Severe renal impairment
- Pregnancy and breast feeding
- Abnormalities of the osephagus which delay oesphogeal emptying (PO bisphosphonates only)

Rare adverse effects:

- Osteonecrosis of the jaw

Other Pharmacological Treatments

- Denosumab – monoclonal antibody against RANKL, a major regulator of osteoclast development and activity. Given as a subcutaneous injection every 6 months.
- HRT – consider risk/benefit balance and therefore its use is generally restricted to younger post menopausal women at high fracture risk who are also suffering from menopausal symptoms.
- Calcitriol - active form of vitamin D and is approved for the treatment of established postmenopausal osteoporosis. It acts mainly by inhibiting bone resorption.
- Raloxifene - selective oestrogen receptor modulator and inhibits bone resorption. It is approved for the treatment and prevention of osteoporosis in postmenopausal women.

Duration of treatment

- Review need for ongoing treatment after 3 years of Zolendronic acid or 5 years of oral bisphosphonates

- Continue treatment if:

- The patient sustained a fracture while on treatment
- History of hip or vertebral fracture
- Patients taking oral glucocorticoids
- Patients 75 years or older

References

https://www.sheffield.ac.uk/NOGG/NOGG%20Guideline%202017.pdf

https://qfracture.org/index.php

https://www.sheffield.ac.uk/FRAX/tool.aspx?country=1