POST MENOPAUSAL OSTEOPOROSIS

Osteoporosis is defined as a systemic skeletal disease characterised by low bone mass, micro architectural deterioration of bone tissue and compromised bone strength, with a consequent increase in bone fragility and susceptibility to fracture, particularly of the wrist, hip and spine. Patients are often not identified as being at risk of osteoporosis, even in the presence of a fracture. Osteoporosis is well recognised as having major morbidity and mortality risks, yet it is treatable if detected. To put it in perspective, a postmenopausal woman's annual risk of fracture is greater than her combined risk of cardiovascular disease and breast cancer.

Incidence/high risk groups

The risk of osteoporotic fracture rises steeply with age. By the age of 80, one in three women will have experienced a hip fracture. The number of women with osteoporosis is growing rapidly, mostly due to the increase in life expectancy, less exercise and reduced intake of calcium and Vitamin D.

Over and above the risk factor of advancing age, several others are known to be associated with an increased risk of osteoporosis in women:

- Premature menopause
- Amenorrhoea – primary or secondary
- Steroid therapy
- Past history of fracture
- Thyroid disease, other metabolic disorders and malabsorption syndromes
- Lifestyle risk factors – poor dietary intake of Calcium and Vitamin D, alcohol, smoking, physical inactivity

Signs and symptoms

Osteoporosis per se has no signs or symptoms. Bone loss itself does not cause pain or other symptoms; it is the resulting fracture or deformity resulting from osteoporosis that causes the ensuing pain. These are most commonly seen in the wrist, spine and hip. Examples of signs and symptoms of osteoporosis include:

- Fragility fractures. These are defined as fractures which are caused by a force equal to or less than a fall from standing. Examples include Colles and hip fractures. Adults in general should not incur a fracture from a trip and fall.
- Kyphosis due to anterior wedge fractures in the spine. This is commonly known as a Dowagers hump when seen in the upper back.
- A loss of height of 2-16cm

- Development of sharp sudden back pain with associated height loss may indicate vertebral fracture.

Diagnosis

The gold standard investigation for the diagnosis of osteoporosis is Dual Energy X-ray Absorbiometry (DEXA). This is recommended for women who:

- are postmenopausal with identified risk factors for osteoporosis,
- have a history of early menopause,
- have a pre-existing disease who would predispose them to osteoporosis,
- are menopausal and are considering hormone replacement therapy for symptom control.

The DEXA test measures the bone mineral density (BMD) of the spine and both hips. A T-score is then generated, which classifies the BMD into the following:

- Normal T-score 0 to -1.0
- Osteopenia T-score -1.0 to -2.49
- Osteoporosis T-score lower than -2.5

Clinical decisions are usually made based on the above results. Most fractures occur in the T-score range of -1.5 to -2.49, so it is essential to treat this group for fracture prevention. The World Health Organisation (WHO) has developed a new diagnostic tool called Fracture Risk Assessment (FRAX) to try to predict an individual patient's fracture risk. This incorporates their own clinical risk factors and their BMD to establish a 10 year fracture risk. This is considered to be more accurate than just BMD assessment.

A low trauma fracture is also considered to be osteoporosis until proven otherwise.

Self Help measures

In general there are lifestyle changes that need to be discussed with the postmenopausal woman regardless of the DEXA result. It is recommended that all postmenopausal women start calcium and vitamin D supplements. Requirements for postmenopausal women are 1,000mg calcium and 800 IU Vitamin D per day. Vitamin D greatly aids the absorption of calcium.

These are both essential for bone health, but are often found in inadequate quantities in postmenopausal women. This is due to several reasons:

- Poor dietary calcium and Vitamin D
- Low oestrogen levels which impairs calcium absorption
- Poor skin exposure to sunlight

Exercise is a very important part of the overall picture for postmenopausal woman as certain forms of exercise will reduce bone resorption. This exercise must be weight bearing such as running, walking, skipping, dancing etc. This will also maintain fitness levels which will contribute to a reduction in fall risk.

Fall prevention is an important aspect for older women. Simple measures such as regular visual assessment, occupational therapy assessment to identify hazards in the home, use of hip protectors in thin women and identification of medical conditions such as postural hypotension which can precipitate falls are all useful in reducing possible fracture risk.

General advice should be given about smoking and alcohol intake should be given.

Drug treatments used in postmenopausal osteoporosis

There are several drugs used in the treatment of postmenopausal osteoporosis, and the choice depends on the DEXA result, the specific areas of bone loss, the age and medical history of the patient, and their risk of fracture. The aim of treatment is always prevention of fracture by stopping further bone loss and increasing bone density. In practice the agents used for both treatment and prevention are the same. The use of preventative treatments should be confined to patients at the highest risk of osteoporosis.

All the treatment modalities have some side effects, but in general the benefits outweigh these side effects. Unfortunately patient compliance can be a problem, due to a combination of unwanted side effects and lack of perceived improvement. Thus regular DEXA measurements while on a course of treatment help to reinforce to the patient that treatment is worthwhile.

Bisphosphonates

This is probably one of the most familiar of the treatment options. They are a group of synthetic compounds which are absorbed onto the surface of the osteoclast, inhibiting their activity and therefore reducing bone resorption. They have no effect on osteoblasts, therefore over time there is a net gain on bone mass. Bisphosphonates are available as daily, weekly and monthly preparations. Studies would suggest that alendronate (Fosamax®) and risedronate (Actonel®) have the most effect on fracture reduction at the hip and spine. Bisphosphonates are associated with gastrointestinal side effects, including oesophagitis. This can be minimised and absorption improved by taking the medication 30 minutes before eating first thing in the morning, and remaining upright for 30 minutes after ingestion. Using less frequent dosing regimens may reduce the incidence of gastrointestinal side effects. Length of treatment required is uncertain but it can be up to 10 years. Evidence shows that that increases in bone density is well maintained for several years after discontinuation of treatment.

Denosumab (Prolia®)

This is one of the more recent additions to the range of products available in the treatment of osteoporosis. It is a monoclonal antibody with binds to RANK ligand. This inhibits osteoclast maturation. It is administered as a subcutaneous injection 6 monthly and has been shown to reduce fracture incidence at both the hip and spine.

Hormone Replacement Therapy (HRT)

This was previously used widely for postmenopausal osteoporosis. However now it has a limited role. It is now predominantly used only for control of menopausal symptoms in the early postmenopausal period, which is associated with a low fracture risk. There is a modest fracture reduction seen with HRT, which is lost after cessation of treatment. It is generally accepted that to maintain any gain in bone density, another antiresorptive agent such as a bisphosphanate then needs to be used. However this fits well with the rationale that agents such as bisphosphonates be reserved for later decades when fracture risk is much greater. Thus HRT does have a small but important role to play in women with mild to moderate bone loss and menopausal symptoms in the immediate postmenopausal period. The rule of prescribing HRT "as little as possible for as short a time as possible" holds true for postmenopausal treatment, in view of the possible slight increase in breast cancer incidence with extended HRT usage.

Raloxifene (Evista®)

Raloxifene belongs to a group of synthetic compounds called selective estrogen receptor modulators (SERMS) which have been shown to reduce the risk of vertebral fractures. It is administered as a daily tablet. It has no oestrogenic effects and some studies have shown a reduction in breast cancer risk.

Strontium ranelate (Protelos®)

Strontium ranelate reduces fracture incidence in both hip and spine. It acts by inhibiting bone breakdown and stimulating bone formation. It is taken in granule form daily and has few side effects.

Parathyroid Hormone (Preotact®)

This is a pharmaceutical form of parathyroid hormone (PTH) manufactured by DNA recombinant technology. It is prescribed only by consultants and is indicated for women at high risk of osteoporotic fracture. It stimulates new bone formation and is self-administered daily as a subcutaneous injection for 24 months.

Teriparatide (Forsteo®)

This is an artificial form of PTH which acts by building bone and reduces vertebral fracture risk. It is only prescribed by a consultant and is self-administered by subcutaneous injection daily for 24 months. It can also help with pain from vertebral fracture.

Conclusions

Postmenopausal osteoporosis is common and increasing in incidence due to an ageing population. There is no screening programme in place at present but that may have to change as the incidence increases. Clinicians can identify high risk patients and assess bone density using DEXA scans.. Prevention is a huge component in the management of this disease, as fractures are costly both to the patient and the health care system. Lifestyle changes can help and should be discussed with all newly postmenopausal women. Treatment options are varied and should be used judiciously at various stages in a woman's life, depending on her fracture risk.

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