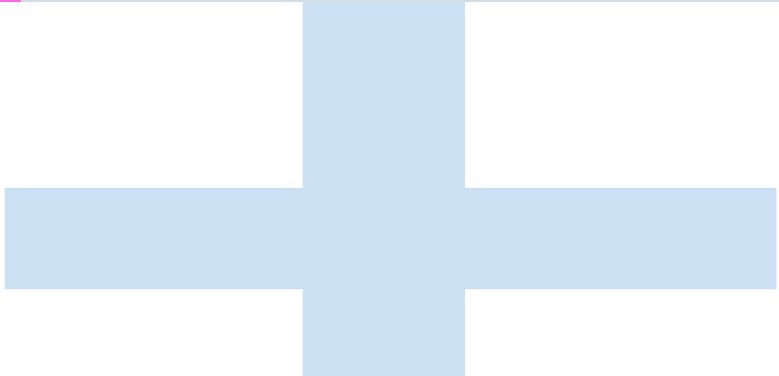


THE
WELL
WOMAN
CENTRE

Osteoporosis



OSTEOPOROSIS

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OSTEOPOROSIS

Definition

Osteoporosis is the term used to describe bones that are weak and susceptible to fracture. It is a very common condition that will affect one in three women and one in eight men during their lifetime. It is thought that women are more at risk because their bones tend to be lighter and less dense, and because their bodies experience hormonal changes after menopause that appear to accelerate the loss of bone mass. In men, osteoporosis is uncommon until after the age of 70.

Bone biology

Like all living tissue, bone is in a constant state of change – remodelling. Minor defects in the bone are broken down and replaced by new healthy bone. Calcium is required for this very complex event and there is a lot of research being done to clarify how the body regulates the whole process. Osteoclasts are the cells that break down bone and osteoblasts are the cells that form new bone. If something happens to either speed up the osteoclast activity or slow down the osteoblast activity then overall bone density may fall.

The natural history of bone

In young people bone is broken down and replaced continuously. Peak bone mass is reached in the early 30's. Bone loss starts to occur naturally from the mid 30's onwards. Calcium is lost from the bone, less remodelling takes place and the bones become thinner. It is important that people have a good peak bone mass because this will largely determine their risk of developing osteoporosis in later life. In women there is a sharp reduction in bone density for the first five to seven years after the menopause. This is thought to be due to the natural fall in the level of oestrogen that is experienced at that time. The rate of bone loss continues after this but at a lower rate. So loss of bone density is a natural part of ageing.

Although the osteoporosis may affect all bones, those of the spine, hip and wrist are most likely to break with minimal trauma. These are called fragility fractures.

Risk factors

Being female

Family history: if close relatives have experienced low impact fractures in their 50's/60's

Over 40

Early menopause – before age 45

Postmenopausal

Smoking

Drinking excessive amounts of alcohol

Sedentary lifestyle

Body mass index under 20 (BMI = height (sq.m)/wt.kg)

Low calcium intake – e.g. in those who eat little or no dairy products

History of eating disorders

History of long intervals between menstrual periods 6-8 week cycles or longer

Prolonged use of injectable contraceptive hormones

Hyperthyroidism – a condition caused by over production of thyroid hormone

Malabsorption problems such as inflammatory bowel disorders

Prolonged use of oral steroid medication

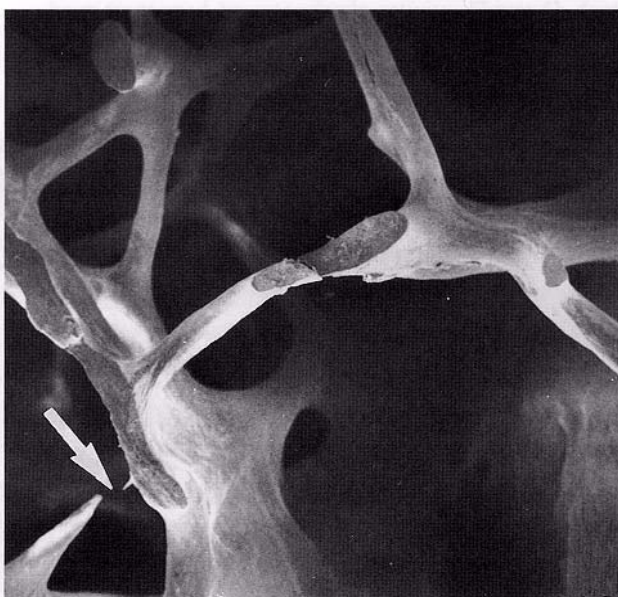
Some antiepileptic medication

Low testosterone levels in men

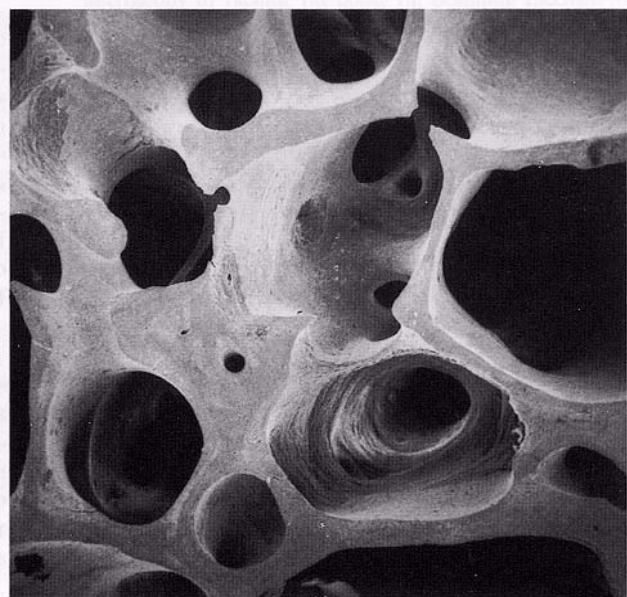
Previous history of one or more fragility fractures

High intake of carbonated drinks, e.g. sparkling water, coca cola

Osteoporotic Bone



Normal Bone



Diagnosing osteoporosis

Unfortunately in many cases the diagnosis is only made after a person has suffered a low impact – fragility – fracture. This may be obvious if it is a wrist or hip fracture. Crush fractures of the bones in the back, the vertebrae, may go unnoticed although in some people there will be severe pain.

Over the last number of years, the availability of DEXA scans has increased the likelihood that people at risk of osteoporosis may be diagnosed before they develop fractures. DEXA (Dual Emission Xray Absorptiometry) scans measure absorption of small amounts of radiation to assess bone density. The radiation involved is much less than that needed for conventional X rays. Measurements are taken at the hip and lumbar spine. If follow up scans are recommended, these should be done by the same clinic / hospital because measurements may vary from one DEXA scanner to another. Normal X Ray equipment that is used for example to take a chest X Ray do not show bone loss until 20 - 30% of the bone has been lost.

Osteopenia means that the bone density is lower than normal but has not reached the stage of osteoporosis where fractures are a risk. If a person has significant osteopenia, as assessed by DEXA scan, then changing their risk factors, e.g. stopping smoking and increasing exercise levels, and possibly taking medication may avoid the risk of developing osteoporosis.

The consequences of fractures

Fractures can be extremely painful and can mean that a person who was previously living independently will need either help in the home or a significant period of residential care before they regain their independence. A wrist fracture, depending on how it heals, may result in permanent reduced function e.g. not being able to confidently lift items with that hand because the wrist may give way causing spillages or breakages. A crush fracture of one vertebra puts pressure on adjoining vertebrae causing further vertebral bones to collapse. This causes the person to lose height and is the reason for the ‘dowager’s hump’ that is sometimes seen particularly in older women. This change in the shape of the back causes the chest and abdomen to be pushed downwards causing problems with breathing and indigestion. Hip fractures tend to occur in older people. The average age of hip fracture in women is 78. The consequences can be devastating. The immobility caused following the fracture can result in

pneumonia or blood clots developing. About 20% of people who have a hip fracture die within six months. Up to 75% of those who survive never regain full independence.

The Domino effect of vertebral fracture



Treatment of osteopenia/ osteoporosis in women

Lifestyle issues are a major factor so the first thing to do is look at these risk factors. Weight bearing exercise in the form of walking for at least 30 mins three times per week will help stimulate bone remodelling. It is also good for balance and muscle strength, thus ensuring less risk of falling. Smoking should be avoided completely. Moderate alcohol intake is acceptable and this is about 14 units per week in women and 21 units per week in men. Those who are underweight should try to gradually attain a normal weight giving them a BMI of 20 –25. Those who are intolerant of dairy products or simply don't like eating them should take calcium supplements. Vitamin D helps calcium absorption so choose a supplement that has a combination of calcium and Vitamin D. The recommended daily intake of calcium is 1500mg. Supplements may be bought over the counter in pharmacies without prescription. Women

who are on long-term injectable hormonal contraception should discuss alternatives with their doctor or consider a bone density scan if they are not keen to change their method of contraception.

People with medical problems such as inflammatory bowel disorders, hyperthyroidism or on antiepileptic medication should discuss the possibility of having a bone density scan with their specialist or GP.

Prescription medication

The first line of treatment is adequate calcium and vitamin D supplementation. Several brands are available on the GMS and drug refund scheme as well as being available over the counter. Medications solely available on prescription fall into three categories – those that reduce bone breakdown (the action of osteoclast cells), those that increase bone formation (osteoblast activity) and those that act on both types of cell. Research is ongoing into how we can easily identify which medication should be best for each individual patient. However, most doctors working outside of research units do not have access to tests that might decide whether a patient's osteoporosis is due to increased bone breakdown or reduced bone formation or both. In the absence of this information, most clinicians base their choice of drug on other factors such as possible side effects and likelihood of patient compliance with drug regimens.

Reduce bone breakdown – HRT, bisphosphonates, raloxifene

Increase bone formation – parathyroid hormone (PTH)

Combination of both actions—strontium

There are no prescription medications licensed for use in premenopausal women because their effects on human pregnancy have not been researched.

In women who are perimenopausal and who have symptoms such as hot flushes and night sweats, consideration should be given to Hormone Replacement Therapy (HRT). HRT will preserve bone density while at the same time relieving their menopausal symptoms. If this treatment is commenced, it is generally recommended that the woman stay on HRT for 2- 4 years depending on the stage in the menopause at which she started medication. The plan

would then be to change to one of the other medications detailed below. (For information on the pros and cons of HRT, please read the section on Menopause).

Bisphosphonates are the most commonly used treatments in the UK and probably also in Ireland. They need to be taken at least 30 - 60 minutes before breakfast or other medications. The patient must remain upright for 30 - 60 minutes after taking the medication to avoid possible oesophagitis (inflammation of the lower end of the tube leading from the mouth to the stomach). So they may not be suitable for people who have stomach problems. However, they are now available in once weekly preparations. A once monthly tablet has been available since the beginning of November 2005. Yearly injection preparations are being developed. Some of the tablets also have either calcium or vitamin D supplements added.

Raloxifene reduces the risk of vertebral fractures but not other fractures such as at the hip. It has some anti oestrogen effects and therefore reduces the risk of breast cancer. However, up to 10% of women get hot flushes as a side effect and like HRT, there is a small risk of developing blood clots.

Parathyroid hormone is a subcutaneous daily injection. It is licensed for use under hospital specialist direction only. The duration of therapy is unclear but it has been used for up to two years in trials. There are no guidelines as to what the best course of action is after treatment has stopped. It seems to reduce both vertebral and non-vertebral fractures.

Strontium ranelate is the newest type of medication to be released for use both by hospital specialists and community doctors such as GPs. It comes as granules that are mixed with water to form a drink that is taken every day. Trials have shown that it reduces the risk of vertebral fracture and hip fracture. It may be better tolerated than bisphosphonates particularly in people who have stomach problems.

Monitoring treatment

Many physicians suggest repeating DEXA scans every two years. However the information gained by repeat scanning when on treatment is limited. Often the bone density level will be unchanged yet we know from population studies that fracture risk is reduced while on

treatment. Tests monitoring bone turnover are probably a better indication but they are not freely available outside research settings.

What is the length of the course of treatment?

For most treatment there is no guidance as to how long someone should take the medication. Often women are on treatment for life. Trials are studying whether or not “drug holidays” (i.e. stopping a medication temporarily for a few months) are of any benefit.

Treatment of osteopenia/osteoporosis in men

There has been less research into the treatment of men with low bone density even though up to 30% of hip fractures occur in men. The beneficial role of calcium and vitamin D has not been proven in men but these supplements have very little in the way of side effects so until more research is available, it would seem sensible to advise calcium and vitamin D as first line treatment. Currently only alendronate, one of the bisphosphonates, is licensed for use in men.

CONCLUSION

Osteoporosis is an extremely common condition that can have devastating effects on quality of life and can even be a cause of death. People need to know how to maximise their peak bone mass in order to reduce their risk of developing osteoporosis in later life. Simple changes in lifestyle can reap huge benefits in the future. For those with significant osteopenia or established osteoporosis there are medications that will help reduce fracture risk. If you feel you are at risk, talk to your Well Woman Clinic doctor, GP or specialist about having a DEXA scan done and / or starting treatment.