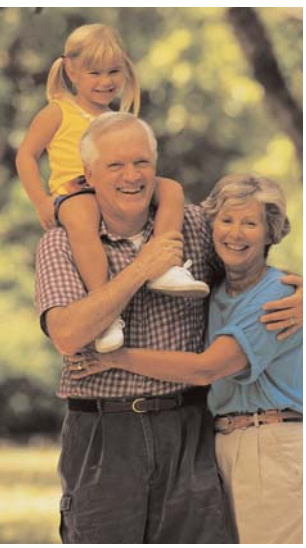
Osteoporosis Risk Factor Update



Osteoporosis is associated with an increased risk of fracture.

Fractures often occur in a situation of minimal trauma. For example, lifting a relatively heavy object such as a suitcase can cause a vertebral fracture due to compression of bone, that is thin and fragile as a result of osteoporosis. The consequences of fractures can be debilitating. Fractures are associated with a decline in the quality of life which can be either short-term while the fracture is healing or long-term due to ongoing pain, deformity and lack of mobility. There is also an increase in mortality associated with fractures - in particular hip fractures.

There are many factors that increase the risk of developing osteoporosis - some of these factors are modifiable and some are not.

Risk factors that can't be changed include; being of Caucasian race, being female and experiencing menopause, and advancing age in both men and women. Women tend to have a thinner bone structure compared to men, thereby increasing the risk of fracture in the presence of reduced bone density. Women with a low body weight and body mass index are at particular risk of osteoporosis. Around menopause and beyond there is progressive loss of bone in women due to both a decline in oestrogen levels and ageing. Women who experience premature menopause (that is prior to the age of 40 years) or prolonged amenorrhoea (lack of periods for longer than six months) in the premenopausal years are also at risk of developing osteoporosis.

Genetic factors can influence the level of attainment of peak bone density in the late adolescent years. Possibly about 20 percent of the population inherits genes that result in a peak bone density that may be well below the average for age and sex at the time when skeletal maturity occurs (age 25-30 years). A family history of osteoporosis, particularly of hip fracture, is a risk factor for osteoporosis. Other heritable diseases include coeliac disease and Crohn's disease. These diseases that affect the bowel can reduce the absorption of calcium and other vitamins such as vitamin D that are essential for normal bone growth. Other medical conditions such as severe liver or kidney disease increase the risk of developing osteoporosis.

Sustaining a fracture as the result of a minor fall, particularly in the middle to later years of life, is highly suggestive of the presence of osteoporosis. Having had one or more fractures in the presence of osteopenia or osteoporosis significantly increases the risk of further fractures.

There are some potentially modifiable medical conditions that are risk factors for osteoporosis. These include hyperparathyroidism, which acts to cause excessive loss of calcium from bone and hyperthyroidism, which increases the body's turnover of bone resulting in bone loss. Medications used to treat other medical conditions can also have a detrimental effect on bone. These include some anti-epileptic drugs and prolonged use of heparin for reducing the coagulation of blood in the treatment of thrombosis. Probably one of the most commonly prescribed drugs, which have an adverse effect on bone, are the oral glucocorticoids. Oral cortisone is used for treating severe asthma, rheumatic conditions and also inflammatory bowel diseases. The effects of cortisone on bone loss occur early in course of treatment and even at low doses such 5 mg per day.

There are a number risk factors for osteoporosis that can be modified. These include smoking, excessive alcohol intake, physical inactivity, drugs which alter stability of gait, environmental obstacles that increase the risk of falls, particularly in the elderly, and a low calcium intake. In addition despite living in a "sunny" climate such as Australia a significant proportion of the community has a

relative vitamin D deficiency. The elderly, in particular those who are mostly confined to indoors, are known to be vulnerable. As well as reduced exposure to sunlight there is reduced ability, associated with ageing, to produce the active form of vitamin D. This form of vitamin D enables the absorption of calcium into the body through the intestine and hence into bone.

Obviously, reducing the modifiable risk factors is important in reducing the risk of osteoporosis. In addition, maximising calcium and vitamin D intake through a well-balanced diet plus supplements if needed, is the first step in treating or preventing osteoporosis. Supplements at recommended levels are generally safe and low in side effects if taken with food. Regular weight bearing and muscle strengthening exercise is helpful in maintaining bone.

There are drugs available to reduce bone loss. The most commonly prescribed group of drugs, categorised as antiresorptive agents, are called bisphosphonates. These drugs are given orally either daily, on a once a week basis or intravenously in some people who are unable to tolerate oral medications. They act by reducing breakdown of bone, hence allowing some building up to occur. In general, research studies over the last 10 years or so indicate that fracture rates in those with osteoporosis can be reduced by 50%.

Hormone replacement therapy, which was often used as first line therapy in women in the early postmenopausal years for osteoporosis without fracture, is currently recommended to be used short term for menopausal symptoms only. Raloxifene is a selective oestrogen receptor modulating drug (SERM) that also reduces bone breakdown and also spinal fractures by 50%. Its use is also associated with a lower risk of breast cancer. A newer drug therapy is parathyroid hormone. This drug is given as a once daily injection. It has been shown to stimulate the formation of bone and to significantly reduce fracture risk. Strontium is a new drug that also reduces spinal fractures. It is never too late to start these medications to prevent fracture.

Non-Modifiable Risk Factors

- Medical conditions
- Hyperparathyroidism
- Hyperthyroidism
- Medications
- Anti-epileptic drugs
- Heparin
- Warfarin
- Oral corticosteroids

Modifiable Risk Factors

- Smoking
- Excessive alcohol intake
- Physical inactivity
- Drugs which cause instability of gait
- Environmental obstacles which cause falls (eg. loose electrical cords)
- Low calcium intake
- Vitamin D deficiency

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