



Insulin Dependent Diabetes Trust

Osteoporosis is There a Link With Diabetes?

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Osteoporosis is a common problem and in the UK one in two women and one in five men over 50 will break a bone.

Treatments focus on slowing down or stopping bone loss, preventing bone fractures by reducing the risks of falls and controlling pains associated with having the condition.

Recent research has shown that there may be links between osteoporosis and both Type 1 and Type 2 diabetes



What is osteoporosis?

It literally means 'porous bones'. Our bones are made up of a thick

outer shell and a stronger inner mesh of tiny struts of bones and in osteoporosis some of these struts become thin or break. This makes the bone more delicate and likely to break. The most common fractures in people with osteoporosis are wrists, hips and spinal bones. Osteoporosis often goes undetected until a fracture occurs.

Causes of osteoporosis

There are two types of cells in bones that are constantly working – one group of cells builds up new bone and the other breaks down old bone. Calcium and phosphate are essential for normal bone formation and up to the mid-20s uses these minerals to enable the bone-building cells work harder to build strength into the skeleton. If calcium and phosphate intake is insufficient or if the body does not absorb enough calcium from the diet, then bone production and tissue may suffer.

As part of the natural aging process, from 40 years onwards the cells that break down bones overtake and bones gradually lose their density.

Who is at risk of osteoporosis?

It is a common problem and in the UK one in two women and one in five men over 50 will break a bone. It is extremely rare in children, young people and pregnant women.

Bone health is largely hereditary but there are factors that can increase the risk of osteoporosis:

- Women who have early menopause or hysterectomy.

- Men with low levels of testosterone.
- People who have broken a bone after only minor injury.
- Medical conditions which make people immobile for a long time.
- The use of certain medications such as steroids and anticonvulsants.
- Medical conditions that affect the absorption of food eg Crohn's disease, coeliac disease or ulcerative colitis.
- Smoking.
- Excessive alcohol intake.
- Women who are underweight or have an eating disorder.

Symptoms

There are no symptoms of osteoporosis in the early stages. In the late stages the symptoms include:

- Fractures of the vertebrae, wrists or hips.
- Low back pain.
- Neck Pain
- Bone pain or tenderness
- Loss of height over time.
- Stooped posture.

If you think you are at risk of osteoporosis

You should discuss this with your GP. You may need a special scan called a dual energy x-ray absorptiometry (DXA), which measures bone density. It is a simple and painless procedure that is recommended for people at high risk. Osteoporosis diagnosed on a bone density scan does not always mean you are at high risk of bone fractures as other factors such as age, have to be taken into account.

Treatment

Treatments focus on slowing down or stopping bone loss, preventing bone fractures by reducing the risks of falls and controlling pains associated with having the condition.

There is a range of drug treatments to reduce the risk of breaking bones which your doctor will discuss.

Note: 21.11.07 A drug to treat osteoarthritis pain has been suspended. The Medicines and Healthcare products Regulatory Agency [MHRA] suspended the sales of Prexige because it can damage the liver. It is used to treat osteoarthritis pain and is in the same class of drugs as Vioxx, withdrawn 3 years ago for causing heart attack and stroke. The MHRA advice is that people who are in good health and benefiting from taking Prexige may continue on it but should see their doctor to discuss alternatives but people taking it who feel unwell should stop taking it immediately and see their doctor as soon as possible.

Lifestyle changes can also help.

- **Regular exercise** that requires muscles to pull on bones help the bones to retain or even gain density eg walking, jogging, yoga, resistance exercises. [Not exercises that increase the risk of falling.]
- **Diet** should include adequate amounts of calcium, vitamin D and protein. High calcium foods include low-fat milk, yogurt, ice cream and cheese, salmon and sardines (with the bones), and leafy green vegetables.
- **Give up unhealthy habits** such as smoking and limit alcohol intake.
- **Prevent falls** by making sure vision is as good as possible, remove hazards around the house, wear good fitting shoes, avoid walking on icy roads alone.

Are there links between osteoporosis and diabetes?

A review of 16 studies involving over 800,000 people who sustained a total of nearly 140,000 hip fractures has found that having diabetes, especially Type 1 diabetes, makes people more likely to have hip fractures.

The review of 12 studies showed that people with Type 2 diabetes are 70% more likely to fracture their hip and in the review of 6 studies, those with Type 1 over 6 times more likely to do so. The researchers suggest that the cause could be diabetes complications, such as retinopathy, neuropathy, low blood sugars and stroke making people more likely to fall.

A study [J Cell Biochem, Nov 2007] refers to bone loss [which can lead to osteoporosis] as 'a less well-known complication of Type 1 diabetes' and that there are differences between bone loss in Type 1 diabetes and age-related bone loss. It suggests that possible contributors to the suppression of bone formation in Type 1 diabetes include: increased marrow adiposity, hyperlipidemia, reduced insulin signaling, hyperglycemia, inflammation, altered adipokine and endocrine factors, increased cell death and altered metabolism.

Another study carried out in Germany [J. Bone Miner Res. Sept 2007 (9)] has shown the trends of longer life expectancy and a lifestyle of low physical activity and high-energy food intake contribute to an increasing incidence of diabetes and osteoporosis. However, people with newly diagnosed Type 1 diabetes may have impaired bone formation due to the absence of the anabolic effects of insulin and amylin, but in people with long-standing Type 1 diabetes, vascular complications may account for low bone mass and increased fracture risk. It is suggested that prevention of fractures caused by osteoporosis in people with Type 1 diabetes may include tight control of blood glucose levels and aggressive prevention and treatment of vascular complications.

People with Type 2 diabetes have an increased fracture risk thought to be caused by increased risk of falling. The research suggests that people with Type 2 diabetes may benefit from early visual assessment, regular exercise to improve muscle strength and balance and specific measures for preventing falls.

Excess body fat may contribute to poor bone health, according to a new study of 115 young women between 18 and 19 years old. The finding adds to the growing list of obesity-related health problems, which already includes an increased risk of heart disease, stroke, cancer, and others.

In the study, researchers conducted three-dimensional bone scans of women with normal body fat (less than 32%) and high body fat (greater than 32%). Women with high body fat had bones that were 8 to 9% weaker than those with normal body fat.

While it's not known exactly why excess fat is bad for bone health, animal studies have found that obese rats produce more fat cells than bone cells in bone marrow, which may explain the weakening.

The finding could be particularly damaging for obese children, whose bones are still developing. Childhood obesity, researchers said, could have a lasting negative impact on the skeleton.

Warning: Avandia, a drug to treat Type 2 diabetes may cause increased risk of bone fractures

In March 2007 GlaxoSmithKline [GSK] issued a warning to women and doctors of an increased risk of bone fractures when taking Type 2 diabetes medications containing rosiglitazone - sold under the names of Avandia, Avandamet and Avandaryl. The warning came after GSK reviewed the Diabetes Outcome and Progression Trial [ADOPT] in which 4,360 people with Type 2 diabetes were followed for 4-6 years to compare rosiglitazone medications to metformin and glyburide [sulphonylurea] on their own.

The trial discovered a pattern of fractures in women taking rosiglitazone

which occurred in the upper arm, hands and feet. These are not places where osteoporosis in postmenopausal women is commonly seen - it is usually in the hip or spine. Men in the study taking the three types of rosiglitazone did not show a difference in fracture rates. In the US people using any of these medications are being advised to report fractures as an adverse reaction.

It is worth noting that a Cochrane Review of Avandia also found an increased number of bone fractures in women taking the drug. It recommended that if you are a woman, especially if you are this, then you should avoid taking Avandia due to the increased risk of bone fractures. There are other drugs for the treatment of Type 2 diabetes that have not been shown to have this risk.

General information about osteoporosis can be obtained from:
National Osteoporosis Society,
Manor Farm, Skinners Hill, Camerton, Bath, BA2 0PJ
Telephone 01761471771 or e-mail info@nos.org.uk

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