



Glucocorticoids (“steroids”) and osteoporosis

What is osteoporosis?

Osteoporosis occurs when the struts which make up the mesh-like structure within bones become thin causing them to become fragile and break easily, often following a minor bump or fall. These broken bones are often referred to as ‘fragility fractures’. The terms ‘fracture’ and ‘broken bone’ mean the same thing. Although fractures can occur in different parts of the body, the wrists, hips and spine are most commonly affected. It is these broken bones or fractures which can lead to the pain associated with osteoporosis. Spinal fractures can also cause loss of height and curvature of the spine.

What are glucocorticoids?

Glucocorticoids (sometimes called corticosteroids or “steroids”) are drugs that are very effective at reducing inflammation caused by conditions such as asthma and arthritis. They are also sometimes prescribed in adrenal or pituitary disease, where they are used to replace the body’s natural steroids.

The most commonly used glucocorticoids are prednisolone and dexamethasone. They can be life-saving and are frequently a vital part of the treatment of many medical conditions. However, doctors only recommend them when they are really needed, and typically use the lowest dose necessary to treat the condition.

How do they affect bone?

One of the recognised side effects of treatment with glucocorticoids is that they can reduce bone strength and make broken bones more likely, particularly when taken over a long period of time. Glucocorticoids have both direct and indirect effects on bone which result in bone loss and reduced strength.

They have a negative effect directly on bone by stimulating the activity of normal cells that remove bone and suppressing the activity of bone building cells.

They can also interfere with the body’s handling of calcium as well as affecting levels of sex hormones.

People vary in the amounts of bone they lose but in those prescribed 7.5mg or more of prednisolone per day, the risk of fractures increases by over 50% in the first year of treatment.

Do all glucocorticoid treatments affect bone?

The impact of glucocorticoid treatments on bone depends on the dose of glucocorticoids as well as the way they are taken (as an injection, cream, inhaler etc). It is, however, glucocorticoid tablets that have been most closely associated with bone loss. The exact dose that is harmful to bone varies between individuals, but research suggests that increased fracture risk can occur even with low doses (2.5-7.5mg prednisolone per day) and rises further with increasing daily doses.

The length of time glucocorticoid tablets are used is also significant. Most experts agree that if they are used continuously, in tablet form, for more than 3 months, there can be an impact on bone. This effect may be seen even earlier if very high doses are used.

When glucocorticoids are used in low doses to replace what the body is not able to make (e.g. in Addison’s disease or pituitary disease), the overall health benefits of the glucocorticoids by far outweigh any potential small negative effect on bones and it is essential that they are taken as directed by your doctor.

What about steroid inhalers, injections and creams?

When taken via an inhaler, or as a cream or an injection, the glucocorticoid is directed at local tissues where it reduces inflammation. Less of the active drug is absorbed into the bloodstream where it can travel to bone and cause damage. Some research has found a link between long term inhaled glucocorticoid use and increased fracture risk but some of this bone loss may actually result from causes or consequences of the disease that requires the glucocorticoid therapy, for example, smoking, underlying lung disease and immobility.

In addition, many people who use inhaled glucocorticoids for a long period of time also have had occasional courses of steroid tablets making it unclear what has caused the damage to bone.

More reliable studies that have accounted for these factors have not found a connection between inhaled glucocorticoids and risk of fracture. In contrast, patients receiving intravenous or intramuscular glucocorticoid injections at regular or high doses may be at risk of broken bones.

What about the impact of long term steroid inhalers used for asthma since childhood?

The impact of glucocorticoid inhalers when used for asthma in young children and continued potentially for many years is uncertain. More work is required in this area. It is very important that the inhaler is not stopped without discussion with your doctor.

Do I need a bone density scan if I am prescribed glucocorticoids?

A bone density scan provides information about the strength of your bones and helps your doctor determine whether or not you are at increased risk of broken bones. A bone density scan will be recommended if it is felt that the results will help decide whether or not you would benefit from drug treatment to reduce the risk of broken bones (see below).

If your risk of breaking a bone is deemed to be high, for example if you are older (usually over 70 years) or have already had a broken bone, or if you are taking a high dose of steroids (more than 7.5mg per day) your doctor may decide to go ahead and begin drug treatment without the need for a scan. If you are not thought to be at high risk, a bone density scan may help to determine what your actual risk is and help guide treatment decisions.

Do I need to take a drug treatment for osteoporosis if I am taking glucocorticoid tablets?

The aim of osteoporosis drug treatment is to reduce the risk of broken bones. Treatments will usually be recommended if it is considered that your risk of fracture is high.

Your risk is assessed based on a combination of factors such as your age, personal and family history of fractures, lifestyle factors such as alcohol intake and smoking as well as the dose of steroids that you are taking. Bone density scanning may also form part of this assessment.

Due to the rapid nature of bone loss that may be caused by glucocorticoids, it is important that bone health is considered when a glucocorticoid is first prescribed and a treatment for osteoporosis commenced as early as possible if it is needed. It is more difficult to assess risk in younger people who are taking glucocorticoids and in these circumstances further specialist opinion may be recommended.

What if I have used glucocorticoids in the past?

It is current use of glucocorticoids that is most strongly associated with bone loss. However, previous use of glucocorticoids may also influence bone strength. Whether or not you need a bone health assessment, because of past steroid use, including a bone density scan, will depend on your individual circumstances. You should discuss these with your doctor.

Do I need to continue with my osteoporosis drug treatments if the glucocorticoids have been discontinued?

If the drug treatment for osteoporosis was prescribed solely because you are taking glucocorticoid tablets it may be possible to discontinue the treatment when the steroid is stopped.

Should I stop my glucocorticoid treatment or reduce the dose because of the risk to my bones?

It is very important that you do not stop taking your glucocorticoid medication until your GP says it is safe to do so. If you suddenly stop taking your medication, it is very dangerous and you could become very ill.

What else can people taking glucocorticoid tablets do to prevent osteoporosis and fractures?

Factors which can help to maintain healthy bones are a well-balanced diet with adequate calcium-rich foods; safe sunlight exposure to get adequate vitamin D; regular weight-bearing exercise; avoiding smoking and keeping alcohol consumption within the recommended limits.

This information reflects current evidence and best practice but is not intended to replace the medical advice provided by your own doctor or other healthcare professional.

This is one of many information resources available about osteoporosis and bone health. View the range at theros.org.uk and order more by calling us on **01761 471 771** or emailing info@theros.org.uk

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