

What you should know about Corticosteroid Induced Osteoporosis



What are corticosteroids?

Corticosteroids are powerful anti-inflammatory drugs, widely used in the treatment of a number of medical conditions such as rheumatoid arthritis and asthma. For many people they are life saving or life enhancing drugs, and their use may be the only way to achieve a better quality of life. Like all potent medications, oral corticosteroids have side effects and osteoporosis (thinning of bone) occurs frequently if they are given for long enough and in high enough doses.

How do corticosteroids affect bone?

Throughout life, bone which is not inert but a living metabolising tissue is constantly being remodelled so that the skeleton can increase in size during childhood/adolescence and repair structural damage, such as when bone fractures. At any one moment the average adult has 500,000 bone remodelling sites throughout the skeleton. Special cells, known as osteoclasts, nibble away an area of old bone creating a small hole (bone resorption). *Osteoblasts*, bone-forming cells, fill in the hole with new bone (bone formation). Corticosteroids affect the rate at which osteoblasts work and reduce their activity. This causes an imbalance in the natural cycle of bone formation and bone resorption, resulting in less bone. Corticosteroids also decrease absorption of calcium in the gut and increase urinary calcium excretion.

What are the consequences of thin bones?

Thin bones are more likely to break as a result of a minor bump or fall. Not all patients prescribed corticosteroids will suffer a fracture. The risk is related to the dose and duration of treatment as well as other underlying medical problems.

Is there a bone-safe dose of corticosteroids?

Theoretically the answer to this question is no. However, in general terms the risk of having a fracture caused by corticosteroid-induced osteoporosis depends on a number of factors. Scientific studies suggest that corticosteroids equal to or exceeding 5 mg of prednisolone per day, taken for several months or more, will cause an increase in bone loss. The effect that this has depends on how strong the bones were to begin with, e.g. men have stronger bones than women.

Will taking inhaled corticosteroids increase my risk of developing osteoporosis?

Inhaled corticosteroids are frequently prescribed as preventive therapy for asthmatics. They have fewer side effects than oral corticosteroids. Higher doses of beclomethasone, budesonide and fluticasone have been shown to have an effect on bone but generally the effect is far less than oral therapy.

How can I reduce my risk of developing corticosteroid-induced osteoporosis?

There are a number of actions that can be taken to reduce the risk.

Can lifestyle changes prevent bone loss?

There are important lifestyle steps that can help to protect bones, but lifestyle alone will not prevent bone loss associated with corticosteroids.

Diet

It is important to maintain an adequate daily dietary intake of calcium (10500mg) e.g. 3 glasses of Physical milk. Vitamin D is important to bone health and is manufactured in the skin through exposure to



sunshine. For those who are house bound and don't get sun exposure, Vitamin D supplements can be taken orally – 800 iu Vitamin D is recommended.

Exercise

Scientific studies have shown that weight-bearing exercises, where the body supports its own weight (e.g. brisk walking), is good

at strengthening bone. Any exercise can be helpful as it increases muscle tone and condition, can improve balance and reduces the risk of falling which is vitally important as a cause of bone fracture.

Smoking

Smoking cigarettes has been shown to increase the risk of fracture, as it limits normal weight gain and has an adverse effect on health, fitness and exercise patterns. Women who smoke are more likely to have an early menopause (before 45 years) than women who don't, and are therefore without protective oestrogen for longer. Giving up smoking isn't easy, but is important for many aspects of health not only bone health

Alcohol

Alcohol taken in excess affects physical co-ordination and reaction times, making you more likely to have a fall. When taken in excess particularly in men reduces bone strength and increases fracture risk. Keep within the recommended guidelines:

- Men: between 3 and 4 units/day or less
- Women: between 2 and 3 units/day or less

These guidelines apply whether you drink every day, once or twice a week, or occasionally. (1 unit of alcohol = pint of ordinary strength beer, lager, or cider or a small glass of wine or a single pub measure of spirits.)

Falls

It is important to reduce the likelihood of a fall resulting in a fracture by removing slippery rugs from polished wooden floors, removing items of furniture or electrical cords near the bed to avoid tripping over in the middle of the night, have non-slip grips on stairs with rails, shower rails and chairs etc. Your Doctor needs to consider minimising medications that cause confusion at night, maximise vision, and balance with glasses and walking sticks and prescribe hip-protectors to wear beneath undergarments which have been shown to significantly reduce the risk of hip fractures when a fall occurs.

What else can your doctor do to reduce your risk of developing corticosteroid-induced osteoporosis?

Your Doctor can prescribe the smallest dose of Corticosteroids and use them for the shortest time possible, or use other

“steroid-sparing” medications that help reduce the dose of steroids needed to treat the underlying disease.

Anti-osteoporosis therapy.

Now your Doctor has a number of medications available to use at the same time as corticosteroids are prescribed to minimise bone loss that results from steroid usage – however, covered by the Pharmaceutical Benefit Scheme (PBS) only if fracture has already occurred.

Hormone replacement therapy, both oestrogen in women and testosterone in men when found to be deficient have a role in preserving bone. Though not studied as extensively as newer therapies they still have a role balanced by each individuals other medical requirements and problems.

A group of drugs called Bisphosphonates, which act to block resorption of bone and are available in this country for treating osteoporosis as alendronate (Fosamax), risedronate (Actonel) and cyclical etidronate with calcium (Didrocal) have been proven to improve bone strength and in limited studies results suggest

reduction in fractures both in the treatment as well as prevention of corticosteroid-induced osteoporosis particularly in post-menopausal women. For those who cannot tolerate oral medications, intravenous options such as pamidronate (Aredia) whilst not covered by the PBS for this indication has been shown to be effective in preventing bone loss.

Other medications you may be aware of such as Evista (raloxifene) have not been adequately studied for this reason. Whilst not yet available for this indication daily injections of parathyroid hormone have also been shown to preserve bone density in this setting.

Conclusion

The clinical problem of steroid-induced osteoporosis is a common one but as you can see there are a number of simple and practical measures available to all that can be undertaken as well as a number of treatment options also readily available that can combat and treat this consequence of otherwise valuable and often life-saving therapy.



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