

What are effective strategies for reducing the risk of steroid-induced osteoporosis?

EVIDENCE-BASED ANSWER Calcium, in combination with vitamin D, prevents bone loss and is recommended in all patients. (Grade of recommendation: A, based on systematic reviews of randomized controlled trials [RCTs]). Alendronate and risedronate prevent fractures and should be considered for all patients at increased risk of fracture (5 mg of prednisone or equivalent, daily for longer than 3 months). (Grade of recommendation: A, based on RCTs) Replacement of sex hormones in hypogonadal patients prevents bone loss and increases bone mineral density (BMD). (Grade of recommendation: A for women, based on RCTs; B for men, based on one randomized, crossover trial.) Calcitonin prevents bone loss for up to 1 year. (Grade of recommendation: A, based on systematic review.)

EVIDENCE SUMMARY A systematic review of 5 RCTs (N=274) confirmed clinically and statistically significant prevention of bone loss at the lumbar spine for patients receiving glucocorticoids who also received calcium (500–1000 mg daily) and vitamin D (400–800 IU) daily.¹ A systematic review found that patients receiving steroids longer than 3 months gained bone mass when placed on a bisphosphonate.² A two-year RCT of 208 patients receiving steroids who also received alendronate or placebo demonstrated an incidence of vertebral fracture of 0.7% and 6.8% (NNT=16; RRR=90%; ARR = 5.9%; $P = .026$), respectively.³ A 48-week RCT involving 477 patients receiving steroids who also received alendronate or placebo demonstrated a 2.3% and 3.7% in incidence of vertebral fracture, respectively (RRR = 38%; ARR = 1.4%; $P = NS$).⁴ A 1-year RCT of 184 men on or off steroids using risedronate found an 82.4% decreased incidence of vertebral fractures compared with those who received placebo (NNT = 5; $P = .008$).⁵

In hypogonadal patients, several small studies have shown that replacement of sex hormones (estrogen in women and testosterone in men) increases lumbar spine BMD (women 2% and 3–4%; men 5%; all $P < .05$). Fracture reduction and risk of long-term use were not studied.^{6–8} In a sys-

tematic review of 9 RCTs, including 441 patients, calcitonin preserved bone mass in the lumbar spine but not the femoral neck during the first year of steroid therapy. Lumbar spine BMD values with calcitonin were significantly higher than with placebo at 6 and 12 months, but were similar at 24 months.⁹

RECOMMENDATIONS FROM OTHERS The American College of Rheumatology recommends calcium and vitamin D be offered to all patients initiating a regimen of prednisone 5 mg/d or its equivalent with expected duration of longer than 3 months. Bisphosphonates should be prescribed for all patients starting steroids and for patients receiving steroids with a T-score less than -1.0; however they should be used with caution in premenopausal women.⁸ A leading researcher states the rank order for prevention is a bisphosphonate followed by a vitamin D metabolite or hormone replacement.¹⁰

Peter G. Koval, PharmD, BCPS

Sarah F. Hutton, PharmD

*Moses Cone Family Practice Residency
Greensboro, North Carolina*

Ann Thering, MLS

*Family Practice Inquiries Network
Columbia, Missouri*

Clinical Commentary by Michael Fisher, MD, at <http://www.fpin.org>.

REFERENCES

- Homik J, Suarez-Almazor ME, Shea B, Cranney A, et al. Cochrane Database Syst Rev. Issue 2, 2002.
- Blair MM, Carson DS, Barrington R. J Fam Pract 2000; 49:839–48.
- Adachi JD, Saag KG, Delmas PD, Liberman UA, et al. Arthritis Rheum 2001; 44:202–11.
- Saag KG, Emkey R, Schnitzer TJ, Brown JP, et al. N Engl J Med 1998; 339:292–9.
- Reid DM, Adami S, Devogelaer JP, Chines AA. Calcif Tissue Int 2001; 69:242–7.
- Kung AW, Chan TM, Lau CS, Wong RW, et al. Rheumatology 1999; 38:1239–44.
- Reid IR, Wattie DJ, Evans MC, Stapleton JP. Arch Intern Med 1996; 156:1173–7.
- American College of Rheumatology Ad Hoc Committee on Glucocorticoid-Induced Osteoporosis. Arthritis Rheum 2001; 44:1496–503.
- Cranney A, Welch V, Adachi JD, Homik J, et al. Cochrane Database Syst Rev. Issue 2, 2002.
- Sambrook PN. Ann Acad Med Singapore 2002; 31:48–53.

Members of the Family Practice Inquiries Network answer clinical questions with the best available evidence in a concise, reader-friendly format. Each peer-reviewed answer is based on a standard search of resources, including MEDLINE, the Cochrane Library, and InfoRetriever, and is graded for level of evidence (<http://minerva.minervation.com/cebm/docs/levels.html>). The collected Clinical Inquiries can be found at <http://www.jfponline.com> and <http://www.fpin.org>; the latter site also includes the search strategy used for each answer.