OSTEOSCAN

PARTNERS IN OSTEOPOROSIS MANAGEMENT

Dr Wilton Braund * Dr George Tallis * Dr Simon Vanlint

December 2013

The staff and doctors of Osteoscan wish you a very happy and safe Festive Season. We thank you for your support in 2013 and look forward to continuing to provide your patients with expert densitometry and advice on fracture prevention in 2014.

We present two topical issues and a quick quiz for your entertainment.

Locations

Kurralta Park

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520 South Road KURRALTA PARK

Marion

1st Floor, Suite 9, Marion Medical Centre
199 Sturt Road SEACOMBE GARDENS

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CALCIUM, VITAMIN D AND CARDIOVASCULAR DISEASE—HOW SHOULD WE ADVISE OUR PATIENTS?

The Framingham Offspring Study showed that low Vitamin D was associated with increased CVD risk and that high levels appeared protective. However, without specific randomised intervention studies we are left with association but cannot establish causation.

In the Women's Health Initiative combined daily supplementation with calcium (1000 mg) and vitamin D (400 IU) did not favorably alter the risk for coronary events or stroke. However, the vitamin D dose was low. It is also possible that the use of supplemental calcium may have increased the risk of CVD events, thus masking the potential beneficial effects of vitamin D.

The possibility of a relation between calcium intake and CVD has generated significant debate. As calcium supplements are widely used, even a modest increase in risk of CVD might translate into a large burden of disease in the population.

A secondary analysis by Bolland of a randomised controlled trial of calcium supplementation in healthy postmenopausal women, primarily designed to assess the effects of calcium on bone density and fracture incidence over five years, concluded that calcium supplementation in healthy postmenopausal women was associated with a trend to increased CVD risk. However, this study used a high dose of a less common form of supplemental calcium (1 g of elemental calcium as the citrate). Bolland has also published a meta-analysis to show that calcium supplements (without Vitamin D) are associated with CVD.

A five-year, double-blind, placebo-controlled study in which 1460 Western Australian women aged over 70 years were given daily supplemental calcium carbonate 1200 mg or placebo showed no effect on CVD risk.

A very large Swedish cohort study showed that CVD was not increased where total daily calcium intake was between 600 mg and 1400 mg , but over 1400 mg daily there was an increase in the risk of CVD and all cause mortality. To add to the confusion, the Canadian Multicentre Osteoporosis Study found that calcium supplements of up to 1000 mg, and increased dietary calcium intake, may be associated with decreased mortality risk in women.

The scientific data is not at all clear-cut!

Key messages for patient management

- Aim for a total calcium intake of 600 – 1400 mg per day. If you have trouble determining your patient's dietary calcium intake, Prof. Chris Nordin has helped develop a fairly simple on line tool for this very purpose, which can be found at http://www.abc.net.au/health/quizzestools/tools/2008/09/30/calcium_quiz.htm#calciumIntake
- High peak calcium levels may be deleterious in terms of CVD risk, so if high dose calcium supplements are required one should prescribe as a divided dose.
- Vitamin D may be shown to offset any adverse effects of calcium and so should be co-administered with calcium.

GLUCOCORTICOID - INDUCED BONE DISEASE

This includes osteonecrosis of the femoral and humeral heads and osteoporotic fractures. Glucocorticoid-induced bone loss mainly affects areas with a lot of cancellous bone: the vertebrae and the hip.

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Telephone Consultations

Wilton Braund and George Tallis are both practicing endocrinologists at EndocrineSA and are available to discuss patient management by telephone. This often occurs in the context of a situation too complicated to address in a standard report.

A consultation may be arranged by telephoning Lisa on 1300 791 996.

Practice Audits

It is estimated that only about 10% of the over-70s population have used the new Medicare item number to have screening BMD performed. It is similar in the United States where 87% of women > 65 years have never had BMD measured. From July 2012 Osteoscan will liaise with practices wishing to conduct audits of their over 70s patients and will provide a free VFA (Vertebral Fracture Assessment) as part of the BMD service. The pick-up rate for new fractures in this age group is about 20%.

Please contact Lisa on 1300 791 996 or email admin@osteoscan.com.au for further information about this service.

GLUCOCORTICOID - INDUCED BONE DISEASE (cont)

It occurs rapidly in the first year of treatment with estimated loss being between 6 and 12%. It continues in subsequent years at a rate of about 3% per annum.

Fractures increase by 75% within the first 3 months. Yet the Australian PBS regulations require a delay of at least 3 months before an anti-resorptive drug will be subsidised. Increased fracture risk has been reported with doses as low as 2.5mg to 7.5mg of prednisolone equivalents per day (our PBS chooses the 7.5mg figure).

In a cohort aged 18 to 64, continuous treatment with 10 mg of prednisolone for more than 90 days led to a 7-fold increase in hip fracture and a 17-fold increase in vertebral fracture. Inhaled glucocorticoids have much less impact, but have some harmful effect at high doses.

Mechanisms

Osteocytes – **apoptosis,** perhaps explaining the early increase in fracture risk. Osteoblasts – fewer. Osteoclasts – numbers are unchanged (fewer form, but their life is prolonged).

Risk Factors

- **Age**. Patients aged 60-80 have a relative risk of fracture of 26 compared to age 18-31. The interval between starting corticosteroids and fracture is less in the elderly.
- **Low BMI**
- **Underlying disease.** Rheumatoid, polymyalgia rheumatica, inflammatory bowel disease, chronic lung disease, transplants are independent risk factors.
- **Existing low bone mass**
- **High glucocorticoid dose.** Fracture risk is not abolished by alternate day dosing.

Fracture Risk Prediction

The FRAX calculator under-estimates fracture risk for corticosteroid-treated patients.

Fracture prevention

All patients should receive Vitamin D and calcium, but this is not sufficient. Alendronate, risedronate, zoledronate, denosumab and teriparatide have been shown to slow the rate of glucocorticoid-induced bone loss. Almost no studies have been designed to show the effect on fracture.

Australian PBS guidelines for alendronate, risedronate and zoledronate permit subsidized treatment for patients on long term (> 3 months), high dose corticosteroid treatment (at least 7.5 mg per day prednisolone or equivalent) with a BMD T score of - 1.5 or less. For Repat patients holding a gold card one can prescribe alendronate or risedronate with T score of – 1.0 or less.

QUIZ

1. In glucocorticoid-treated patients, the risk of fragility fracture rises within the first:
   A. 1 week
   B. 3 months
   C. 9 months
   D. Decade

2. Concerning the relation of CVD risk to calcium and Vitamin D supplementation which statement is false?
   A. Total daily calcium intake greater than 1400mg may be associated with an increase in CVD risk.
   B. Limiting peak calcium levels by split-dosing may theoretically limit any adverse effect of high dose calcium supplementation.
   C. Vitamin D should be co-administered with calcium supplements to counteract any potential adverse effect on CVD risk.
   D. Current scientific data provides clearcut and unequivocal evidence to guide therapeutic rationale.

Answers: 1B; 2 D