Letters to the Editor

Osteoporosis and the role of vitamin D and calcium

SIR—We were interested to read the review by Sahota on vitamin D deficiency, insufficiency and sufficiency and its role in osteoporosis [1]. The author discussed the benefits of vitamin D and calcium supplementation in reducing the incidence of fractures by improving the mechanical and structural integrity of the skeleton. An additional interesting area of research that the article did not address was the role of vitamin D supplements in reducing the incidence of falls.

Falls increase with age, and more than 90% of fractures occur as a result of falls. The major predictive factors for non-vertebral fractures, besides bone density at the femoral neck, are increased body sway and impaired muscle strength [2], presumably because of the association with falling. Supplementation with vitamin D and calcium of nursing-home residents reduces hip fractures and other non-vertebral fractures. With this treatment, a marked reduction in fractures was noted within the first 3–6 months. However, within this period there was only a modest increase in bone mineral density [3]. This suggests that vitamin D and calcium treatment may have additional effects by reducing the frequency of falls and thereby fractures. There is now increasing evidence that vitamin D plays an important role in maintaining neuromuscular function.

Proximal muscle weakness, limb pain and abnormal gait are recognized symptoms of osteomalacia. Vitamin D receptors have been identified on skeletal muscle, and 25-hydroxycholecalciferol directly influences intracellular accumulation of phosphate, thereby playing an essential role in maintaining muscle metabolism and function [4]. Deficiency of vitamin D has been associated with proximal muscle atrophy with loss of type II muscle fibres, which recovers with 6–12 months of vitamin D supplementation [5]. Low serum calcidiol concentrations have been correlated with reduced muscular function, predominantly affecting the proximal musculature, in the older population [6]. A randomized double-blind study by Geusens et al. found that quadriceps strength increased more in a group of elderly women with low vitamin D after treatment with vitamin D than in the placebo group, though this did not reach significance [7].

With regards postural stability, Pfleifer et al. have recently demonstrated that short-term supplementation with calcium and vitamin D in community dwelling women aged over 70 years reduced body sway and mean number of falls over a 1-year period [8]. A significant reduction in fractures was not observed, but this may be related to the small sample size and small dosage of vitamin D.

Associations between improvement in vitamin D status and function have been observed in studies by Sorensen et al., who noted a reduction in time to dress after vitamin D treatment [9], and by Gloth et al., who observed the effects of vitamin D supplementation on function by questionnaire and found a significant improvement in frail home-bound older adults [10].

The hypothesis that, by improving postural stability, muscle strength and function, vitamin D supplementation may reduce the incidence of falls and thereby
fractures is indeed tenable and highlights the need for double-blind intervention studies to assess this further.

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