Is there rationale for vitamin D prescribing in the elderly population?

SIR—We read with interest the paper of Dhesi and colleagues [1] in which they reported a 72% prevalence of hypovitaminosis D in a falls clinic population. Vitamin D is essential for bone metabolism and for neuromuscular function, and may contribute to both osteoporosis and falls. The authors argued that ‘in the absence of toxic effects, a pragmatic approach may be to supplement all attendees at a falls clinic’. Although it is widely accepted that a combination of falls and intrinsic bony fragility are the main determinants of osteoporotic fractures, the issue of preventive vitamin D supplementation is still a matter of controversy [2–9].

We investigated the serum concentrations of 25(OH)D and PTH within 24 hours of sustaining a HF in 264 patients (75% females; mean age 83 ± 8.4 (SD) years) and in 69 sex and age matched patients without HF admitted to the geriatric ward at the same time. In HF patients, 25(OH)D levels were low (<50 nmol/l) in 208 (79%) and very low (<20 nmol/l) in 50 (19%) of subjects compared with 44% and 13% respectively in the non-HF group, indicating that hypovitaminosis D is a significant risk factor for HF (OR=1.80; 95% CI=1.2–3.0; P<0.02). Low vitamin D levels were more common in persons aged 75 years and over (83% vs 58%, P<0.03), in institutionalised persons (94% vs 75%; P<0.01) but equally represented in males and females. Hypovitaminosis D was associated with pertrochanteric more than cervical fractures (87% vs 74%), a longer length of hospital stay (26 vs 18 days) and increased discharge to residential care (20% vs 8%).

In elderly people with HF we also found a significant heterogeneity in vitamin D-PTH relationship. Four distinct states could be identified: (i) hypovitaminosis D and secondary hyperparathyroidism (25(OH)D level 22.8 ± 8.8 nmol/l; PTH level >5.5 pmol/l, mean 13.9 ± 8.3) in 48%; (ii) hypovitaminosis D (26.6 ± 7.8 nmol/l) and normal/low PTH level (3.5 ± 1.5 pmol/l) in 18%; (iii) hyperparathyroidism (11.1 ± 8.5 pmol/l) with normal 25(OH)D level (55.1 ± 11.9 pmol/l) in 21% and (iv) normal 25(OH)D and PTH levels in 13%. These data demonstrate that PTH secretion is not entirely due to 25(OH)D concentration and this relationship requires further investigation.

Although hypovitaminosis D and secondary hyperparathyroidism are very common in older people with HF, this remains a neglected problem. On admission only 8% of patients sustaining a HF were taking vitamin D and less than 2% were taking calcium supplements. On discharge 32% and 21%, respectively, were prescribed these agents, although it has been shown that supplementation with vitamin D (700–800 IU daily) and calcium significantly reduces the rates of hip and other fractures [3, 4, 6, 9], while monotherapy with vitamin D (without calcium) is less effective. Underutilisation of vitamin D and calcium in elderly patients with times by the year 2050 because of demographic changes, and implementation of an effective preventive strategy based on risk factor modification is therefore of great clinical importance.

Although vitamin D deficiency has often been reported in elderly people, there are few studies of vitamin D status in HFs and results are conflicting [3, 5, 6, 10, 11]. Moreover, secondary hyperparathyroidism which is thought to play a key role in bone resorption has not been a consistent finding in these patients. Furthermore, it is unclear which biochemical abnormality – increased parathyroid hormone (PTH) or decreased 25(OH)D levels – is more significant for muscle weakness and falls [12–14].
Osteoporotic hip and other fractures has been reported worldwide, and less than 10% of the population aged >65 years meet the current recommendations for calcium and vitamin D intakes [6].

It should also be noted that vitamin D and calcium supplementation was provided in most trials of anti-osteoporotic agents (including bisphosphonates and selective oestrogen receptor modulators). This raises the question of whether these drugs would be as effective without normalizing vitamin D and calcium status.

In addition to anti-fracture activity, vitamin D has potent noncalcaemic actions and vitamin D supplementation may be beneficial for prevention and treatment of hypertension, cardiovascular syndrome ‘X’, diabetes, some cancers and other diseases known to be associated with risk of falling. Utiger [15] states that all adults need 800–1000 IU vitamin D daily. In the majority of elderly patients primary hypovitaminosis D and secondary hyperparathyroidism can be corrected by plain vitamin D supplementation (1000 IU a day). However some subjects may have 1,25(OH)2 D3 deficiency (e.g. due to renal impairment) or resistance and require therapy with an active vitamin D analogue.

In conclusion, hypovitaminosis D is under-diagnosed and under-treated in elderly HF patients. There is now convincing evidence that low vitamin D levels are associated with ageing, occurrence and type of hip fracture, its severity and outcomes. Widespread prophylactic use of vitamin D and calcium is safe, effective and cheap and should be considered as a mandatory, integral part of treatment for both primary and secondary prevention of age-related bone disease in all older people at risk of fracture, particularly those over 75 years of age and in residential care. However, further investigations are needed to find the cause(s) of isolated hypovitaminosis D or secondary hyperparathyroidism and to evaluate the optimal treatment of these conditions.

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