

# Vitamin D – a timely review

There is absolutely no question that vitamin D is a hot topic in primary care. There has been an exponential growth in vitamin D research over recent years and, as such, the review by Poole et al published in this edition of the Journal (starting on page 199) is both timely and relevant, providing as it does a very comprehensive review of a complicated subject area.

Vitamin D is probably somewhat taken for granted and there is an assumption that it is plentiful in a healthy diet. Unfortunately, very few foods contain naturally occurring vitamin D. This partly explains why vitamin D deficiency has become an epidemic in all age groups in both the US and Europe. Vitamin D deficiency not only causes metabolic bone disease among children and adults but may also increase the risk of many common diseases. This latter area is now where considerable research is being directed (Holick, 2004).

Some understanding of vitamin D physiology is important and this is covered very well in Poole et al's review. Vitamin D is a pro-hormone, converted to 25(OH) vitamin D, with subsequent conversion to 1,25(OH)<sub>2</sub> Vitamin D in the kidney. Measurement of 25(OH) vitamin D, the major circulating form, is the only way to determine whether a person is vitamin D replete, is vitamin D deficient or has intoxication. It is not unreasonable to ask why 1,25(OH)<sub>2</sub> is not measured, it being the physiologically active form. The reasons are that: its half-life is less than 4 hours; its concentrations are 1000-fold less than those of 25(OH) vitamin D; and, most importantly, as an individual becomes vitamin D deficient a compensatory increase in parathyroid hormone stimulates the kidney to produce more 1,25(OH)<sub>2</sub> vitamin D. Therefore, concentrations of 1,25(OH)<sub>2</sub> vitamin D are not useful and can mislead clinicians into thinking that individuals are vitamin D replete when they are in fact severely deficient.

A meta-analysis published in the *BMJ* in June this year (Schöttker et al, 2014) is worthy of mention in addition to the evidence

presented in the review. This study sought to investigate the association between serum 25(OH) vitamin D and mortality in a large consortium of cohort studies, with particular focus being given to age, sex, season and differences between countries. This included data from eight prospective cohort studies from Europe and the US. Results showed that the lowest quintile of serum 25(OH) vitamin D was associated with increased all-cause cardiovascular mortality. However, although demonstrating an association, no conclusion can be made about causality in relation to mortality and vitamin D, owing to the observational nature of the data.

## Clinical implications

Therefore, in a similar fashion to anaemia screening, which I discussed in the previous issue (Downie, 2014), I think that readers will want to consider whether more widespread measurement of 25(OH) vitamin D should be performed in people with diabetes. In cases where clinical symptoms dictate such a course of action, then there is no doubt that the answer is yes, but in otherwise asymptomatic individuals then I would argue that "routine" measurement is not indicated, or at least the arguments for it are not well enough established.

However, the article serves to remind us of the importance of vitamin D in health and disease and, at the very least, should ensure that vitamin D and its measurement is included in our considerations when seeing and treating people with diabetes. ■



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Downie P (2014) Screening for anaemia as part of an annual diabetes review: Is it needed? *Diabetes & Primary Care* **16**: 118–20

Holick MF (2004) Sunlight and vitamin D for bone health and prevention of autoimmune diseases, cancers, and cardiovascular disease. *Am J Clin Nutr* **80**(6 Suppl): 1678S–88S

Schöttker B, Jorde R, Peasey A et al (2014) Vitamin D and mortality: meta-analysis of individual participant data from a large consortium of cohort studies from Europe and the United States. *BMJ* **348**: g3656