LETTERS

Vitamin D: Ten Beliefs

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To the Editor:

The narrative review by Allan and colleagues concluded that while vitamin D supplementation provides some benefit in fracture prevention, it has not been demonstrated to prevent cancer, respiratory tract infections or rheumatoid arthritis.¹ What the authors failed to realize is that many of the clinical trials were based on the guidelines for pharmaceutical drugs. Such trials have two main assumptions: (1) that the trial is the only source of the agent and (2) that there is a linear dose-response relation. Neither assumption is satisfied for vitamin D trials. Heaney recently outlined the guidelines for trials of nutrients such as vitamin D.² They include that the baseline 25-hydroxyvitamin D [25(OH)D] concentration should be measured, only those with low concentrations should be enrolled in the study, sufficient vitamin D should be given to raise concentrations to achieve significant reductions in the risk of health outcomes, and the achieved concentration should be measured. In addition, meta-analyses should only compare trials with similar conditions.

A typical 25(OH)D concentration-health outcome relation is given for breast cancer in Figure 2 in a recent paper.³ Risk decreases rapidly from 10 to 30 nmol/l, at a moderate rate from 30 to 60 nmol/l and slowly above 60 nmol/l. The percentile values of 25(OH)D concentrations for women aged over 50 years in the US for 2001–2006⁴ can be used with the 25(OH)D-breast cancer incidence relation to estimate the reduction in breast cancer rates if all women achieved 100 nmol/l, which could take about 4000 IU/day vitamin D₃. The result is a 35 % reduction. This value compares well with the results from the Women's Health Initiative for those women not taking vitamin D or calcium prior to enrollment: taking

1500 mg/day calcium plus 400 IU/day vitamin D₃ by them significantly decreased the risk of total, breast and invasive breast cancers by 14–20 %.⁵

Regarding respiratory tract infection clinical trials (Belief 3 in Ref. 1), it is noted that in the trial from New Zealand finding no benefit for large-dose vitamin D₃, the baseline 25(OH)D concentration was 72.5 nmol/l, which is in stark contrast to the trial from Mongolia finding significant benefits of 300 IU/day vitamin D₃ had a baseline concentration of 17.5 nmol/l.

Thus, more progress could be achieved in the near term if clinical trials were designed to evaluate 25(OH)D concentration-health outcome relations trying to determine whether giving vitamin D₃ supplements to the general public affects health outcomes.

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Compliance with Ethical Standards:

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