Commentary

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Vitamin D deficiency: supplementation or test & treat?

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The relation between lack of sunshine and rickets is known since the end of the 19th century. In the 1890s, Dr Palm, a Scottish medical missionary, working in Japan noted the absence of rickets. Back in England, he was intrigued by the very high prevalence of rickets. From other medical missionaries, Palm learnt that children in tropical zones, such as China, India and Ceylon were free of rickets. Palm came to the conclusion that "the geography of rickets appears to involve the temperate latitudes of Europe, and he attributed the absence of rickets in tropical countries to plenty of sunshine [1].

In 1921, Hess and Unger reported that exposing children to sunlight was an effective treatment for rickets [2]. This was quickly followed by the observation that exposure of various foods to ultraviolet radiation imparted anthracitic activity. In 1940s, when vitamin D2 became easily available, its direct addition replaced irradiation of food stuffs. As a result, vitamin D fortification of various types of food became widespread throughout the United States and Europe [3]. This practice was abandoned when hypercalcemia was reported in many infants and kidney stones in adults [2,4].

The world Health Organization defines vitamin D deficiency as 25(OH) D levels < 20 ng/mL, insufficiency as 2 1ng/mL to 29 ng/mL and sufficiency as >30 ng/mL. Using there criteria, a large number of reports highlighted the high prevalence of vitamin D insufficiency worldwide, including tropical countries with abundant sunshine throughout the year, such as India, Pakistan, Bangladesh, Ceylon and UAE [5]. Worldwide, an estimated 1 billion people suffer from vitamin D insufficiency, and the insufficiency is not restricted to any country or age group. It seems neither food nor solar exposure incidental to the day-to-day activity is able to provide vitamin D sufficiency. The clinical implication of this fact lies in the reports that inadequate vitamin D nutrition is associated with many disorders such as adverse pregnancy outcome, autoimmune disorders, heart disease, insulin resistance, etc. [5]. Therefore, it is obvious that most of the people need vitamin D supplementation.

In view of the earlier experience cited above, fortification of food is not desirable. The other option is administration of a known amount of vitamin D daily as a pharmaceutical agent. Due to differences in available sunshine, manner of clothing, food habits, environmental pollution and cutaneous pigmentation, there cannot be any guideline applicable to all the people. The US Endocrine Society's practice guidelines suggest daily vitamin D supplementation of 400 to 1000, 600 to 1000, and 1500 to 2000 IU for ages 0 year to 1 year, 1years to 18 years, and all adults, respectively [6]. These doses seem to be very safe, since hypercalcemia or renal stone disease was not observed in a retrospective study of 86 men and women,18years to 84 years, who received an equivalent of 3000 IU/d of vitamin D2 for treatment of vitamin D deficiency for a mean duration of 26 m (5m to 72 m) [7] . The possible risk of vitamin D toxicity due to vitamin D is usually cited as a concern. Therefore, periodically, of 25(OH) D levels may be determined in those on vitamin D supplements. Although vitamin D toxicity has been reported only when 25(OH) D levels exceeded 150 ng/ml, Institute of Medicine (USA) considers it desirable to keep 25(OH) D levels ≤ 50 ng/dL [8].

This leaves one to ponder: in view of the wide-spread vitamin D insufficiency in all populations, who should receive vitamin D supplements? Universal population-wise screening for vitamin D sufficiency may not possible. However, it would be prudent to test and treat selected individuals suffering from conditions in which vitamin D insufficiency has been implicated, e.g. pregnancy, hypertension, type II DM, autoimmune disorders, muscle weakness, osteoporosis etc.

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Conflicts of interest

None

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