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Shifting of Vitamin D Deficiency to Hypervitaminosis and Toxicity

Sir,

There has been an increasing awareness of roles of Vitamin D and parathyroid hormone (PTH) in maintaining a variety of essential regulatory functions in health and complex role in increasing the incidence of many chronic diseases. Vitamin D deficiency (VDD) and secondary hyperparathyroidism (sHPTH) in the general population are reported globally. Newer strategies and recommendations have been put forward for dietary and supplementation intake of Vitamin D and Calcium in the light of pandemic of VDD.

At the same time, with increased Calcium and Vitamin D supplementation, the incidence of renal stones has increased. Unprescribed and prescribed supplementation and faulty preparations or errors of labelling are being detected and now an increasing number of patients are reporting with Vitamin D toxicity.¹

An area of great controversy in our setup is in the treatment strategies for correcting VDD. Several strategies adopted have been reported in literature recently and practice patterns of physicians in treating VDD are also widely variable. Very few physicians perform complete biochemical testing to assess the overall bone health and response to Vitamin D replacement.

We reported that single injection of 600,000 IU of cholecalciferol achieved Vitamin D levels above 20 ng/ml in 75% of the healthy adults volunteers after 8 weeks.² There is no change in intestinal Calcium absorption before or after Vitamin D injection and maximum Vitamin D-dependent Calcium absorption is achieved even at lower Vitamin D levels in our population.³ The effects of these mega doses are still under study and practices are based on individual experiences.

We have been reporting high prevalence of VDD from our laboratory since 2000.^{4,5} Recently, we noted a shift in the data and encountered a significant number of subjects tested at our laboratory to be suffering from high Vitamin D levels. Of more significance is the group of subjects under one year of age reported to have levels greater than 150 ng/ml (Table I).

Table I: Frequency of children with high and toxic Vitamin D levels reported from clinical laboratories of the Aga Khan University Hospital, Karachi.

25(OH)D levels	Frequency (%)	Mean \pm SD
Deficiency (< 20.0 ng/ml)	886 (39.4%)	11.2 \pm 5.4
Insufficient (> 20.0 - 30.0 ng/ml)	553 (24.6%)	24.6 \pm 2.7
Sufficient (30 - 80 ng/ml)	590 (26.2%)	44.8 \pm 13.5
High (80 - 150 ng/ml)	148 (6.6%)	110 \pm 21.6
Toxicity (> 150 ng/ml)	72 (3.2%)	152.9 \pm 11.6

These finding shows that there is inadvertent use of higher doses of Vitamin D resulting in toxicity. Replacement of Vitamin D for maintaining sufficient bone health is necessary but achieving balance between optimal and toxic levels is equally important. For this, serum Vitamin D should be tested appropriately, and doses adjusted accordingly. Furthermore, pharmacists, physicians, nutritionists and patients should be educated about the toxic potentials of Vitamin D as it is not a benign agent.

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