Vitamin D Treatment and Toxicity: *Primum Non Nocere*

We read with interest the recent review article on Vitamin D deficiency and treatment in childhood [1]. Intermittent dosing with Stoss regimens is effective in the treatment and prevention of vitamin D deficiency, is much more economical than daily dosing, and ensures supervised administration and compliance. However, stoss does not necessarily mean large. Stoss (German for "bump up") effect can be obtained with smaller doses than those used currently by pediatricians in India. Caution needs to be exercised as vitamin D is fat soluble and accumulates in the body. The resulting hypercalcemia can be life threatening and hypercalciuria can result in nephrocalcinosis and renal failure.

The authors quote the study of Gordon, *et al*. [2] for the use of 2000 IU daily or 50,000 IU weekly for 6 weeks. They do not mention that some of the infants on weekly dose regimen developed toxic levels of 25 OHD by the end of the study. The study of Shah and Finberg, quoted by the author did not evaluate rigorously for toxicity. Studies have demonstrated that single oral doses of 600,000 IU used to treat nutritional rickets in 3-36 months old children led to significant risk of hypercalcemia [3]. Vanstone, *et al*. [4] have documented hypervitaminosis D, hypercalcemia and hypercalciuria in infants receiving 1400 to 2000 IU of vitamin D daily for 6 to 12 weeks. Thus many expert groups now recommend caution in treating children with higher doses of vitamin D. The APEG Australasian Pediatric Endocrine Group specifically mentions that stoss therapy is not recommended for children less than 3 months of age; for older children a more conservative approach of a single initial dose of 50,000 to 150,000 IU is recommended [5].

It is time pediatricians in India stopped using regimens which employ 6 lakh units, and avoid the risk of vitamin D toxicity. More emphasis should be laid on treating children with minimally effective doses.

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REPLY

In children with symptomatic vitamin D deficiency, Stoss therapy is ideal in situations where adherence to therapy is questionable, because the doses can be observed. Basic pharmacology principles suggest that the circulating half-life is a suitable dosing interval for a drug. Because vitamin D and 25(OH)D exhibit half-lives in the body that are in the order of months and weeks, the daily administration of vitamin is probably unnecessary [1]. None of the cases of hypercalcemia attributed to vitamin D supplements reported by Vanstone, *et al*. [2]. was symptomatic, and hence their observations might not be clinically relevant. Gordon, *et al*. [3] observed a higher overall incidence of mild hypercalcemia at baseline in contrast to after treatment, and also reported that all subjects were asymptomatic.

Emel, *et al*. [4] recently compared Stoss theray (150,000 units oral) with daily dose schedule (2000 units daily for 6 weeks) in children and reported that there was no evidence about the increased risk of hypercalciuria in low-stoss therapy. Higher vitamin D levels were obtained in low-stoss therapy group. Symptomatic hypercalcemia due to Stoss therapy (in appropriate doses) in children with Vitamin D deficiency has not been reported so far. In our review, Stoss therapy was suggested as an option only for children more than 1 year of age, and particularly in situations where lack of compliance is a possibility.

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