

Indian Children need Higher Vitamin D Supplementation

The recent Indian Academy of Pediatrics (IAP) guidelines on prevention and treatment of vitamin D and calcium deficiency make an interesting read [1]. The committee has done well to formulate guidelines by deriving information from western recommendations and scant Indian data. However, we wish to point out that the proposed recommendations for vitamin D supplementation do not adequately address the issue of prevention of vitamin D deficiency in Indian children. The doses of vitamin D recommended in the western guidelines are based on their local data. Such data are virtually non-existent in our country [2]. Extrapolation of western data for Indian guidelines is inappropriate for several reasons. After a similar oral dosing, Indians do not achieve the same serum vitamin D concentrations as their western counterparts; an observation similar to their reduced ability for cutaneous vitamin D synthesis [2]. Although the reasons for variations in response to oral vitamin D are unknown at present, it is suggested that differences in vitamin D binding and degradation, and single nucleotide polymorphisms located in or near genes involved in synthesis, transport, activation, or degradation of vitamin D may influence serum vitamin D concentrations [2]. Evidently, there is a need to acquire data on efficacy and safety of graded supplementation doses of vitamin D (400, 1000, 2000, 4000 IU/day) in Indian children [3]. Based on their recent data, the US Endocrine Society has suggested daily vitamin D intakes of 400-1000 IU and 600-1000 IU in children <1 year and >1-18 years of age, respectively [3]. Similar higher intakes are recommended for Central European children. Furthermore, in view of the recently discovered statistical error in the estimation of the recommended dietary allowance (RDA) for vitamin D, the guidelines by the US Institute of Medicine on vitamin D supplementation are likely to change in near future to almost 3-times the current RDA [4]. Recent studies in Indian children suggest that oral doses of up to 2000 IU/day are barely able to maintain vitamin D sufficiency [3]. In both these studies, the apparently high doses of vitamin D were given for durations of 6-12 months, and were reported safe [3]. In another study, a dose of 60,000 IU (monthly or two-monthly) achieved vitamin D sufficient status in only 47% girls at the end of one year [5]. In this context, the currently recommended doses of 400 and 600 IU/day may be inadequate to maintain vitamin D sufficiency for musculoskeletal health in Indian children. For non-skeletal benefits, even higher doses are required for

which the evidence at present is not robust as the committee has rightly observed.

DEVI DAYAL¹ AND NIMISHA JAIN²

Departments of ¹Pediatrics and ²Endocrinology,
PGIMER, Chandigarh, India.
¹drdevidayal@gmail.com

REFERENCES

1. Khadilkar A, Khadilkar V, Chinnappa J, Rathi N, Khadgawat R, Balasubramanian S, *et al.* Prevention and treatment of vitamin D and calcium deficiency in children and adolescents: Indian Academy of Pediatrics (IAP) Guidelines. *Indian Pediatr.* 2017;54:567-73.
2. Khadilkar AV, Chiplonkar SA. Vitamin D supplementation in children: Indian perspectives. *In: Preedy VR, Srirajaskanthan R, Patel VB, editors. Handbook of food fortification and health nutrition and health.* New York: Humana; 2013. p. 373-81.
3. Dayal D. It's high time to revise Indian guidelines on vitamin D supplementation in children. *J Pediatr Endocrinol Metab.* 2016;29:425-6.
4. Papadimitriou DT. The big vitamin D mistake. *J Prev Med Public Health.* 2017;50:278-81.
5. Marwaha RK, Tandon N, Agarwal N, Puri S, Agarwal R, Singh S, *et al.* Impact of two regimens of vitamin D supplementation on calcium-vitamin D-PTH axis of schoolgirls of Delhi. *Indian Pediatr.* 2010;47:761-9.

AUTHORS' REPLY

To determine vitamin D requirements, dose response studies with various doses are essential. There is very little data on dose response to vitamin D in the Indian context. However, several studies have reported that if vitamin D is given together with calcium, and the compliance is adhered to, there is a significant increase in vitamin D concentrations [1].

The action of vitamin D on bone is mainly through the absorption of calcium. One of the major problems in the Indian children is poor intake of calcium and low calcium-to-phosphorous ratio. As this is very specific to Indian circumstances, the guidelines have stressed that adequate intake of calcium at all age groups is critical. We have considered data pertinent to the Indian situation while drafting the guidelines. Another set of recent Global guidelines specifically meant for children has Indian representation, and they also considered Indian data [2].

While many reasons have been suggested for low vitamin D concentrations in Indians, lack of exposure to sunlight (the main source of vitamin D in Indians) is likely to be a major contributor. Thus, for the prevention of vitamin D deficiency in Indians, the ICMR report on recommended daily intake (RDI) for Indians states that

increasing the RDI for vitamin D is not the solution but ensuring adequate exposure to sunlight is. Therefore, the ICMR Committee agreed outdoor physical activity as a mean to achieve adequate vitamin D. This is reflected in their recommendations and they make no specific suggestions for vitamin D intakes in different groups [3]. However, under situations of minimal sunlight exposure, a specific recommendation of a daily supplement of 400 IU (10 µg) has been suggested.

In references quoted by authors of this correspondence around 95% subjects were vitamin D deficient; hence, doses to prevent vitamin D deficiency would be insufficient. However, other Indian studies have shown a good response to 600 IU vitamin D supplementation per day with little difference between 600 and 1000 IU doses [4,5].

Acknowledgements: Dr Pramod Jog, Past President Indian Academy of Pediatrics (2016), Dr Jagdish Chinnappa, Dr Narendra Rathi, Dr Rajesh Khadgawat and Dr Balasubramanian provided their expert comments for preparing this manuscript.

***ANURADHA KHADILKAR AND VAMAN V KHADILKAR**
Hirabai Cowasji Jehangir Medical Research Institute,
Pune, India.
*anuradhavkhadilkar@gmail.com

REFERENCES

1. Ekbote VH, Khadilkar AV, Chipplonkar SA, Hanumante NM, Khadilkar VV, Mughal MZ. A pilot randomized controlled trial of oral calcium and vitamin D supplementation using fortified laddoos in underprivileged Indian toddlers. *Eur J Clin Nutr.* 2011;65:440-6.
2. Munns CF, Shaw N, Kiely M, Specker BL, Thacher TD, Ozono K, *et al.* Global consensus recommendations on prevention and management of nutritional rickets. *J Clin Endocrinol Metab.* 2016;101:394-415.
3. Indian Council of Medical Research (ICMR), Nutrient Requirements and Recommended Dietary Allowances for Indians, a Report of the Expert Group of the Indian Council of Medical Research 2010. Hyderabad, India: National Institute of Nutrition; 2010.
4. Garg MK, Marwaha RK, Khadgawat R, Ramot R, Obroi AK, Mehan N, *et al.* Efficacy of vitamin D loading doses on serum 25-hydroxy vitamin D levels in school going adolescents: an open label non-randomized prospective trial. *J Pediatr Endocrinol Metab.* 2013;26:515-23.
5. Khadgawat R, Marwaha RK, Garg MK, Ramot R, Oberoi AK, Sreenivas V, *et al.* Impact of vitamin D fortified milk supplementation on vitamin D status of healthy school children aged 10-14 years. *Osteoporos Int.* 2013;24: 2335-43.

Transcutaneous Bilirubin Measurement in Preterm Neonates Receiving Phototherapy

Pendse, *et al.* [1] published their unique study on transcutaneous bilirubin measurement in preterm neonates in a recent issue of *Indian Pediatrics*. I would like to draw authors' attention on certain issues.

Authors state that preterm neonates >28 weeks and <37 weeks of gestation having clinically detectable jaundice were included in study. Jaundice first becomes evident on face and progresses in a cephalocaudal direction to involve chest, lower abdomen/ thigh and soles/ palms [2]. Clinically detectable jaundice up to what level was defined for inclusion in the study? Recently, visual inspection of jaundice as being reliable indicator is increasingly debated [3-5].

Authors also acknowledge that no additional blood investigations except for total serum bilirubin before

starting phototherapy (PT) and at 12 hours of PT were done for the purpose of study. Exclusion criteria mentioned in the study include conjugated hyperbilirubinemia, evidence of hemolysis or poor perfusion [1]. How preterm babies having conjugated hyperbilirubinemia or evidence of hemolysis were decided clinically? Babies of mothers who are Rh-negative should ideally had a blood type, Rh and Coombs test done at birth as some unsensitized Rh-negative mothers would have needed Anti-D immunoglobulin within 72 hours after delivery.

SHAHID AKHTAR SIDDIQUI

*Department of Pediatrics,
SN Children Hospital and MLN Medical College,
Allahabad, Uttar Pradesh, India.
sha.akht@yahoo.com*

REFERENCES

1. Pendse A, Jasani B, Nanavati R, Kabra NK. Comparison of transcutaneous bilirubin measurement with total serum bilirubin levels in preterm neonates receiving phototherapy. *Indian Pediatr.* 2017;54:641-3.
2. Kramer LI. Advancement of dermal icterus in jaundiced newborn. *Am J Dis Child.* 1969;118:454-8.
3. American Academy of Pediatrics Subcommittee on