

Diagnosis and Treatment of Hypovitaminosis D: Recommendations from India and Brazil

Brazil and India are continental-sized countries with approximately 20% of the world population (1.2 billion persons in India and 200 million in Brazil). Both belong to the BRICS economic group (Brazil, Russia, India, China, and South Africa), sharing financial features common to developing nations.

They have a large heterogeneity of climates. Almost the entire Indian territory is located between the Equator and the Tropic of Cancer, whereas most of Brazil territory is located between the Equator and the Tropic of Capricorn.^[1] The Indian and Brazilian coastline, where most of the population lives, is 7500 and 8500 km long, respectively.

Exposure to sunlight is essential for cutaneous Vitamin D synthesis. In spite of being sunny during most of the year, a significant amount of persons in these two countries carry the burden of Vitamin D insufficiency or deficiency, especially the elderly and postmenopausal women, although otherwise “healthy” adolescents are also represented. In India, risk factors include traditional dress, avoidance of sunlight exposure, skin pigmentation, and multiple dietary factors as a result of specific cultural beliefs.^[2] Although a mild lack of Vitamin D may be asymptomatic or cause tiredness, a severe deficiency may cause serious problems such as growth retardation, rickets, osteomalacia, and secondary hyperparathyroidism favoring osteopenia and osteoporosis.

The Brazilian Society of Endocrinology and Metabolism published, in 2014, their recommendations for the diagnosis and treatment of hypovitaminosis D,^[3] and in this current issue of the Indian Journal of Endocrinology and Metabolism, the Endocrine Society of India reports their detailed and updated recommendation providing guidance for the endocrinologists in how to assess, treat, and prevent Vitamin D deficiency.^[2]

There are controversies in how to diagnose Vitamin D deficiency, who should be tested, who should be treated for, and what is the best therapeutic regimen. This is aggravated by the exponential rise in Vitamin D testing and supplementation which raises the concern that many individuals are being tested and treated without solid-based evidence.^[4] Therefore, Vitamin D guidelines from these countries, with limited financial resources, are welcomed to reinforce previous recent recommendations in guiding physicians how to avoid unnecessary tests and supplementation.^[5,6]

The most recent guidelines all agree that Vitamin D is important for skeletal health, but there is no solid evidence demonstrating its benefits for nonskeletal outcomes (i.e.,

cancer, cardiovascular, autoimmune, and mental disorders). Both Brazilian and Indian Endocrine Societies agree that universal screening for the 25-hydroxyvitamin D (25(OH) D) status is not recommended due to the high cost of this procedure and due to the risk of routine supplementation in healthy population with adequate Vitamin D levels. Persons who should be tested are the individuals at risk for hypovitaminosis D. The Endocrine Society of India makes an important recommendation that Vitamin D supplementation may be occasionally prescribed, without previous testing, in resource-constrained environments, a commonly encountered problem in several regions of countries with a similar economic status.^[3] In spite of these recommendations, Vitamin D testing increased several folds in the past decade.

The 25(OH)D serum levels are the recommended method to assess the Vitamin D status.^[2,3] Although high-performance liquid chromatography coupled to mass spectrometry is the gold standard method, immunoassays are acceptable if ones take in consideration their limitations, in special within-assay and between-assay variability.

There is no consensus regarding the cutoff value for the definition of vitamin deficiency. The Brazilian Endocrine Society utilizes the following definition: serum 25(OH) D below 20 ng/mL (50 nmol/L) is classified as deficiency, levels ranging from 20 to 29 ng/mL (50–74 nmol/L) as insufficiency, and between 30 and 100 ng/mL (75–250 nmol/L) as sufficiency.^[2] Following this assumption, hypovitaminosis D may be defined as a serum 25(OH)D below 30 ng/mL (75 nmol/L). The Endocrine Society of India defines 25(OH)D levels between 20 and 40 ng/mL (50–100 nmol/L) as adequate for most of the population.^[3] The need for a consensual definition is important in view of an apparent Vitamin D insufficiency epidemic.

For both endocrine societies, the serum 25(OH)D >30 ng/mL (75 nmol/L) may provide additional health benefits than a cutoff above 20 ng/mL (50 nmol/L) for individuals presenting with conditions such as osteoporosis, obesity, pregnancy, lactation, elderly, malabsorption syndromes, renal or liver insufficiency, and medications interfering with the Vitamin D metabolism.^[2,3]

Recently, a consensus group representing 11 international scientific organizations, published a paper defining new references values for the serum 25(OH)D levels: sufficiency being defined as 25(OH)D >20 ng/mL (>50 nmol/L), insufficiency when the 25(OH)D are between 12 and 20

ng/mL (30–50 nmol/L), and deficiency when the 25(OH)D is <12 ng/mL (30 nmol/L).^[4] By adopting these new recommendations, the present Vitamin D deficiency “pandemy,” may return to more acceptable numbers, avoiding unnecessary supplementation for persons with adequate Vitamin D nutritional status.

Most medical societies also recommend routine Vitamin D supplementation to maximize bone health utilizing doses adjusted for the patient’s age: children from birth-1 year (400 IU/day), individuals between 1 and 70 years (600 IU/day), and those over 70 years (800 IU/day).^[2,3-7]

Cholecalciferol (Vitamin D3) is the preparation of choice. The doses vary according to the degree of deficiency, the patient’s age, and the presence of risk factors. As a practical rule, it can be predicted that for every 100 IU supplemented, there is an increase of 0.7–1.0 ng/mL in the concentration of 25(OH)D. Vitamin D3 supplementation is a safe procedure with doses up to 10,000 IU daily for 5 months not inducing signs of toxicity. The Vitamin D daily maintenance doses recommended by the Indian and Brazilian Endocrine Societies are the same as the Endocrine Society.^[2,3-7]

Both guidelines offers recommendation in how to treat Vitamin D deficiency in special situations (i.e., chronic kidney disease, osteoporosis, obesity, postbariatric surgery, pregnancy).^[2,3]

Since the dietary sources of Vitamin D are scarce, especially in India and Brazil, recommendations for a healthy and safe sunlight exposure (more than 90% of Vitamin D is obtained by skin synthesis trough sunlight), associated with Vitamin D food enrichment (most food contains very little Vitamin D naturally), could be sufficient to control the epidemic of hypovitaminosis D and its negative health effects, in addition of reducing the medicalization of a easily preventable problem. Until these objectives are met, Vitamin D supplementation should be indicated to meet the minimum requirements.

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Website:
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DOI:
10.4103/2230-8210.205485

How to cite this article: Alves C. Diagnosis and treatment of hypovitaminosis D: Recommendations from India and Brazil. *Indian J Endocr Metab* 2017;21:367-8.