

# Vitamin D Deficiency Eradication: A National Priority

SANJAY KALRA\*, NITIN KAPOOR†, RAKESH SAHAY‡, ABDUL H ZARGAR#, SHEHLA SHEIKH¥, ARUNDHATI DASGUPTA£, SAMBIT DAS§, UNNIKISHNAN G^

## NUTRITION AND HEALTH

Nutrition is a major determinant of health. Food security and caloric sufficiency have contributed, in no small measure, to the improvement in lifespan and overall health observed across most of the globe.

Various facets of nutrition, apart from protein and energy balance, have been explored and addressed by researchers. One example is iodine nutrition. A well-known micronutrient, its fortification of salt has led to near-universal eradication of iodine deficiency disorders (IDD) and their resultant complications. Severe cases of cretinism and goiter are now a medical rarity. Credit for this achievement goes to clinical science and community medicine: to clinical endocrinology for understanding the link between iodine, thyroid function and physical/mental health, and to public health, for translating this knowledge to awareness, advocacy and action; the action being iodine supplementation.

## MALNUTRITION AND HIDDEN HUNGER

Malnutrition, however, remains a major challenge even in today's world. India is the biggest contributor of undernourished people in the world, with around

194.4 million people, or 14.37% of its population, not receiving enough nutrition. India has one of the worst rates of child malnutrition in the world, with one-third of malnourished children globally being Indian.<sup>1</sup> Advances in science and medicine have uncovered unique forms of malnutrition, termed 'hidden hunger' (Table 1). These include deficiencies in micronutrients such as vitamins, minerals and electrolytes. Suboptimal intake of these nutrients can lead to a wide spectrum of disorders and diseases. Individual ill health influences the health of the family and of the society and nation as well.<sup>2</sup>

Micronutrient malnutrition is a public health problem in several developing nations. Micronutrient malnutrition is a huge economic problem as well. The short-term economic cost of micronutrient malnutrition in India amounts to 0.8% to 2.5% of the gross domestic product.<sup>2</sup>

## VITAMIN D AND HEALTH

In this regard, one important micronutrient is vitamin D. Studies from India have reported a wide range of vitamin D deficiencies, from 30% to as high as 100%. Community-based studies conducted in the last 10 years have shown a prevalence range of 50% to 94% of vitamin D deficiency in India.<sup>3,4</sup>

This moiety is actually a hormone with multiple effects, including musculoskeletal, metabolic, mitogenic and anti-miasmatic (related to immunity). Epidemiological studies have revealed the high prevalence of vitamin D deficiency across all geographical areas of India in all population subsets. Research also documents the results of such deficiency on the musculoskeletal system and other organ systems. The health economic impact of hidden hunger is significant.

**Table 1. The Spectrum of Hidden Hunger**

Micronutrient deficiency
• Minerals – Ca, Fe, I
• Vitamins – D, B complex, A
• Electrolytes/fluids – Na, K, water

\*Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India

†Professor and Head (Unit 1), Dept. of Endocrinology, Diabetes and Metabolism, Christian Medical College, Vellore, Tamil Nadu, India

‡Professor and Head, Dept. of Endocrinology, Osmania Medical College, Hyderabad, Telangana, India

§Endocrinologist, Centre for Diabetes and Endocrine Care, National Highway Gulshan Nagar, Srinagar, India

¥Consultant Endocrinologist, Prince Aly Khan Hospital, Mumbai, Maharashtra, India

£Endocrinologist, Dept. of Endocrinology, Rudraksh Superspecialty Care, Siliguri, West Bengal, India

§Professor, Dept. of Endocrinology, KIMS Medical College, Bhubaneswar, Odisha, India

^CEO and Chief of Endocrinology, Chellaram Hospital - Diabetes Care & Multispecialty, Pune, Maharashtra, India

### Address for correspondence

Dr Sanjay Kalra

Dept. of Endocrinology, Bharti Hospital, Karnal, Haryana, India; University Center for Research & Development, Chandigarh University, Mohali, Punjab, India

E-mail: brideknl@gmail.com

The relevance of the widespread deficiency and necessity for supplementation has been debated. While vitamin D may not be a panacea, its strong association with chronic diseases and acute conditions has been highlighted. Hence, it is an important, inexpensive and safe therapy for several diseases and in different phases of life, such as pregnancy, childhood and old age.<sup>5</sup>

### VITAMIN D SUPPLEMENTATION

Due to its diverse and multidimensional impacts on the overall health of individuals, vitamin D is an important contributor to national health. As clinicians and community medicine experts, it is time to start a nationwide campaign to eradicate vitamin D deficiency. Just as previous campaigns against IDD, and current efforts against iron deficiency anemia, this fight for vitamin D sufficiency will have significant public health benefits. We have already witnessed the success of the IDD Control Program in India, with sustained political commitment, the increased production of iodized salt, and involvement of the private sector, the institution of legislation to ensure the iodization of salt, and the catalytic role played by academic institutes, civil society and international agencies.<sup>6</sup> Adopting the best practices from such successful programs and current situational analysis, a vitamin D deficiency eradication policy plan needs to be devised and implemented. Vitamin D sufficiency will be associated with better musculoskeletal competency, functionality and quality of life. Along with savings accrued by minimizing work hours lost in seeking health care, vitamin D sufficiency will enhance productivity and economic health.

### METHODS OF VITAMIN D SUPPLEMENTATION

Vitamin D is available through sunlight and food. However, the duration and extent of sun exposure required are difficult to achieve for most individuals. Though food fortification has been suggested as a means of improving vitamin D status, it is difficult to achieve adequate levels through this method. Fortification of milk is also not allowed in India, as it amounts to 'adulteration', coupled with the fact that vitamin D is hardly present in vegetarian, especially vegan, diets, vitamin D supplementation is required for most persons. While those with symptomatic/or documented

deficiency require higher doses for replacement, supposedly 'asymptomatic', individuals may also benefit from supplementation with doses mentioned in the recommended daily allowance. As the National Institute of Nutrition (NIN) recommends 600 IU/day,<sup>7</sup> a monthly dose of 60,000 IU should be deemed practical and prudent. Vitamin D supplementation may be integrated into existing national health care programs.

Relevant caveats, of course, must be kept in mind while suggesting vitamin D supplementation as a public health measure. Overdosage should be avoided, and persons with comorbid diseases like endocrine, renal or hepatic disease must be referred to appropriate specialists. National health is everyone's right and everyone's responsibility. Enhancing awareness about the importance of vitamin D sufficiency is the first step towards achieving this goal.

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