

The Need of Vitamin D Supplementation Programme in India

Vivek Dixit¹, James Pegrum², Dinesh K Dhanwal³, Sahil Batra⁴, Bhavuk Garg⁵

Purpose

With the aim to alleviate the vitamin D deficiency in Indian population for the achievement of better bone health on the path of holistic health approach.

Background & Introduction

Vitamin D is unique as it is both a nutrient and hormone that provides wide variety of health benefits to human health. The health benefits of vitamin D are beyond bone health confirmed from various studies viz vitamin D not only regulate calcium metabolism but also regulates insulin production, reduces the risk of diabetes and cancer, rennin production, helps in destruction of infectious agents, regulation of cell growth, enhances immunity, maintenance of vascular tone of the body, myocardial function and helps in many more complex diseases as well. Recently, Vitamin D has received enormous attention worldwide and referred as drug of the decade when its deficiency referred pandemic [1]. The quantum of problem can be understood by looking at its (vitamin D) deficiency in Indian subcontinent with a prevalence rate between 70 to 100% [2].

Several studies have seen the result of vitamin D supplementation including improvement in handgrip strength [3] increased newborn's length in pregnant women [4]. Vitamin D supplementation shown reduces risk of maternal co morbidities and helps improve neonatal outcomes [5]. Vitamin D requirements are probably greater in pregnancy, as evidenced by physiologically higher 1,25-dehydroxy vitamin D levels seen in the second and third trimesters. Studies recommend that vitamin D should continue to supplement in all pregnant women from the 12th week of gestation onwards. The results suggest a safest dose to adhere to 4000 IU/day as a standard practice [6].

Whether vitamin D supplementation in pre-diabetes subjects prevents the development of diabetes is a matter of debate as the results from the available studies are inconsistent. However, a short-term vitamin D supplementation was found helpful in the decline of residual beta cell function (RBCF) in children with type 1 diabetes [7]. Effect of 12 months of vitamin D supplementation on glycemic parameters and progression of pre-diabetes to diabetes in an ethnically homogeneous Kashmiri population showed significant lowering in FPG, 2-h plasma glucose and A1C levels [8]. Study on healthy subjects also shown beneficial effect that were supplemented with cholecalciferol at a dose of 60,000 IU/week for 12 weeks resulted in improvement in the skeletal muscle energy metabolism [9]. Indian studies regarding vitamin D supplementation including pregnant women [10], Young women [11] and Asian Indians [12] already shown beneficial effect. However, randomized controlled trials provide some low-quality evidence to support vitamin D supplementation in asthma [13], acute respiratory infections (ARI) [14] and in improving insulin resistance as well [15].

¹Department of Orthopedics, All India Institute of Medical Sciences, New Delhi, India.

²Nuffield Orthopedics Centre, University of Oxford, UK.

³NMC Super Specialty Hospital, Abu Dhabi, UAE.

⁴Junior Resident, ⁵Associate Professor, Orthopedics, AIIMS.

Correspondence: Dr. Vivek Dixit, Department of Orthopedics, All India Institute of Medical Sciences, New Delhi, India.

E-mail Id: vivek_sgpgi@yahoo.com

Orcid Id: <http://orcid.org/0000-0002-3448-1856>

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The advocacy for vitamin D supplementation would not have been done only for populations at risk for developing vitamin D deficiency; sensible sun exposure is an inexpensive and enjoyable way to maintain vitamin D stores. It seems a paradox where majority of population is vitamin D deficient living in sunny country. Reasons to this problem are many including environmental (latitude & altitude), clothing pattern, higher melanin content, food habits and genetic factors [16].

Fortification of food products in India is rare. According to recommended dietary allowance (RDA), should meet the need of majority of the population. Therefore, an additional intake of vitamin D needed either through supplements or fortified foods. Foods fortified with vitamin D usually contain 100 IU per serving. Consumption of vitamin D fortified foods; especially milk has shown a significant improvement in 25(OH) D levels. Even though, fortification has many practical issues including the choice of product, how much to fortify to be enough! Logistics of fortification and monitoring is a challenge too. Developed countries like USA and Canada have started fortification of milk with vitamin D in 1930s. Recent studies suggest the fortification of vitamin D through staple food may be a viable strategy to meet up vitamin D deficiency especially in children [2]. According to Institute of Medicine (IOM), the recommended intake of vitamin D should be 600 IU/day for all individuals (1–70 years), appears insufficient to meet vitamin D sufficiency (≥ 30 ng/mL) [17]. Let's assume, if the typical serum 25 (OH) D levels in average Indian is 10 ng/ml and the target serum 25 (OH) D levels is around 30 ng/ml, then the requirement would be at least 2000 IU/day. However, recent studies suggest the vitamin D intake to attain a desired serum 25(OH) D status required a dose of 4000 units/day [18].

However, 1000 IU of vitamin D/day has shown better results than 60,000 IU/week in populations but it will be difficult to feed 1000 IU/Day to populations due to logistics issues. In clinical practice, a dose of 60,000 IU/week initially for 8 weeks and then limiting for once a month commonly seen as prophylactic doses schedule in populations to acquire optimal status of vitamin D [19]. It is equally important to monitor vitamin D levels in body through periodic blood check-up while supplementation to monitor the vitamin D toxicity. It would be appreciable if the voluntary testing of vitamin D in government hospitals to be tested for free in similar fashion like ongoing voluntary HIV and diabetes testing. This voluntary testing of vitamin D will be helpful in population to keep updated about their bone health.

Ongoing studies encourage improving the knowledge, awareness and attitude towards vitamin D especially in young generation [20]. Needless to say, a wide publicity and advocacy of vitamin D supplementation programme from civil societies with the help of government will be

an appreciable step. Likewise the success of previous major supplementation programmes in India such as iron-folic acid supplementation; iodine fortification and vitamin A supplementation programme, it will be good to have fortified food products to boost bone health of population. This approach will not only help to optimize the vitamin D deficiency but also help to mitigate the growing burden of communicable and non-communicable diseases as well. Moreover, while implementing the Vitamin D supplementation/fortification programme as a public health initiative; the diversity in Indian population should be kept into consideration thus requires a careful selection of target population in the community.

Conflict of Interest: None

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