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Vitamin D Deficiency in Indians – Prevalence and the Way Ahead

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Vitamin D is endogenously synthesized in human beings from photo conversion of 7-dehydrocholesterol in the skin to cholecalciferol on exposure to ultraviolet radiation of sun. In a tropical country like India, where sunlight exposure is abundant, vitamin D deficiency seems unlikely. However, as opposed to this, various studies have highlighted that 70-100% Indians in different age groups vitamin D insufficient or deficient [1].

In a follow up study in infants, Agarwal et al showed that out of 179 exclusively breastfed infants, 55.67% at 10 weeks and 44.33% infants at 6 months at vitamin D levels <11 ng/ml and 16.49% infants developed rickets [2]. About 43.2% infants aged 2-24 weeks suffer from vitamin D deficiency [3]. Ekbote et al have demonstrated vitamin D deficiency in 83% of toddlers aged 2.7±0.52 years from Pune city (Western India) [4]. Seventy-seven percentages of the children who spent a majority of time in the day in daytime crèche had vitamin D deficiency as they had no exposure to sunlight [5]. Toddlers residing in areas of high levels of atmospheric pollution in Delhi (Central India) have shown to have significantly higher levels of vitamin D deficiency as compared to those from less polluted areas [6]. In older children, 93.7% children aged 6-17 years have shown to be deficient in vitamin D [7]. Prevalence of vitamin D deficiency is noted to be similar in children from both upper (91.9%) and lower (89.6%) socio economic strata [8].

In adults, Harinarayan et al studied vitamin D levels in women of reproductive age and postmenopausal women from South India. Seventy six percentage of reproductive age women and 70% of post-menopausal women were reported to be vitamin D deficient [9]. Studies from Lucknow (Central India) have also shown that 84.3% urban women and 83.6% rural women suffered from vitamin D deficiency [10]. In another study from Kashmir (North India), 58.5% adults have been shown to suffer from vitamin D deficiency [11].

The probable reasons of the wide spread vitamin D deficiency in Indians could be because of low dietary vitamin D intake, high fiber and phytate intake that depletes vitamin D levels [12], reduced exposure to sunlight [5], pollution [6] or reduced exposure of skin to sun light because of cultural and traditional habits like “burkha” or “parda”. However, what is really alarming is that despite the wide spread vitamin D deficiency, Indian Council of Medical Research (ICMR) has not given specific recommendations for daily vitamin D consumption except in specific medical conditions

where it recommends a daily supplement of 400 IU [13]. For normal healthy children and adults, ICMR only recommends outdoor activities in sun as a means to acquire adequate vitamin D levels [13] which really doesn't seem to be sufficient in the current Indian scenario to achieve optimum levels of vitamin D given the wide spread prevalence of deficiency in India.

To elevate the prevalence of vitamin D deficiency in India, it's very important that public and the private health sector work very closely with each other.

- Firstly, it is very important that the ICMR revise the recommended daily allowance to include daily recommendations for Vitamin D levels
- Educational programs need to be planned to increase public awareness regarding vitamin D deficiency, causes, long term consequences and treatment
- Vitamin D supplementation should be made available at affordable rates that are easy to consume and widely available to the general public. Prophylaxis programme could be planned for vitamin D supplementation especially for vulnerable groups such as infants, toddlers, pregnant and lactating women and elderly
- Public health policies should be devised for fortification of foods such as oil, milk, infant cereals, breakfast cereals with vitamin D
- Daily physical activity of half an hour in sun should be made compulsory part of school curriculum in India

It is thus very evident that vitamin D deficiency is wide spread and prevalent in all age groups in India. The prevalence in most studies is alarmingly very high. Long term vitamin D deficiency has severe consequences. Food fortification, educational programs and public health policies soon need to be formulated to reduce the prevalence of vitamin D deficiency in India.

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