Editorial

Vitamin D Deficiency among Adults: Recent trends

Rabindran[1], Gedam DS[2]

[1]Dr. Rabindran, Consultant Neonatologist, Billroth Hospital, Chennai, [2]Dr D. Sharad Gedam, Professor, L. N. Medical College, Bhopal, MP, India

Address for Correspondence: Dr Rabindran, E mail: rabindranindia@yahoo.co.in

……

Abstract

Vitamin D Deficiency has become prevalent entity know. It is associated with various morbidities like osteoporosis, hip fracture, femur fracture. Early manifestation include pain in weight-bearing joints, back, thighs and/or calves, difficulty in walking and/or climbing stairs, or running and muscle cramps.

Key words: Vitamin D deficiency, Hip fracture, femur fracture, vitamin D level.

……..

Vitamin D deficiency possibly was described some 2000 years ago [1]. It was during the industrial revolution when it became a public health problem. Following the discovery of vitamin D, extensive public health measures like vitamin D fortification and provision of vitamin D supplements, the problem was almost eradicated in many parts of the globe. However over the past 20-30 years attention once again has been drawn to vitamin D deficiency. Vitamin D deficiency is defined as a total 25-hydroxyvitamin D level of less than 20 ng/mL [2]. Vitamin D insufficiency is defined as a level of 20 to 31 ng/mL, and a level of 32 ng/mL or greater is indicative of sufficient levels [2]. It is estimated that more than 1 billion people including elderly, young adults and children are vitamin D deficient [3]. The peak age for vitamin D deficiency is between 6 and 18 months; however adolescence and adulthood is another period during which the incidence increases.

It is highly unrecognised. Adults with severe deficiency may present with vague manifestations including pain in weight-bearing joints, back, thighs and/or calves, difficulty in walking and/or climbing stairs, or running and muscle cramps and can be misdiagnosed as fibromyalgia, chronic fatigue syndrome, or simply depression.

National Health and Nutrition Examination Survey estimated the prevalence of vitamin D deficiency as 79% among adults [4]. In India, prevalence of severe Vitamin D Deficiency was 27% among adolescent males and 42% among females [5].

There are many factors that can explain the recent resurgence of increasing vitamin D deficiency among adults. They include the zenith angle of the sun (those living in countries of high latitude are at higher risk than those living near the equator), atmospheric pollution, extent of skin coverage by clothing (veil/ hijab), degree of skin pigmentation, time spent outdoors, use of UV screens (especially >8 SPF) due to the concern of developing skin malignancies due to UV radiation from sunlight, Morbid obesity, Advancing age with decreased cutaneous Vitamin D production, Malabsorption caused by various gastrointestinal disorders like Gastrectomy, Small intestinal disease, resection/ bypass, Gluten enteropathy, Acquired vitamin D deficiency due to increased catabolism or metabolic clearance secondary to Anticonvulsants use, Calcium deficiency with secondary hyperparathyroidism, Primary hyperaparathyroidism and Paget's disease of bone.
Most natural foods contain very little quantities of vitamin D.

The current dietary recommendation for vitamin D is insufficient to maintain values for sufficiency (40 ng/mL) [6]. Intakes of 800 to 1000 IU/ day achieve concentrations > 28 ng/mL, the lower limit of desirable range [7]. Hence it is important to increase dietary source with fortification or supplementation. Recent evidence suggests that vitamin D deficiency may have a close association with cardiovascular morbidity and mortality, metabolic syndrome and Type 2 Diabetes Mellitus which also explains the increasing trend of vitamin D deficiency among adults. The prevalence of vitamin D deficiency was 88% among obese patients as compared to 31% among nonobese individuals. The sequestration of vitamin D metabolites in fat compartments decreases its bioavailability. Higher incidence of vitamin D deficiency was noted among pregnant women and those with Graves' disease [8].

Vitamin D deficiency is also highly prevalent in the HIV-infected population; the nonnucleoside reverse

transcriptase inhibitor, efavirenz has consistently been associated with vitamin D deficiency [9]. The formation of Vitamin D decreses by 50% with age as a result of decline in renal function and a decrease in calcium absorption. A high prevalence of vitamin D deficiency has been noted in patients receiving Home parenteral nutrition and those with chronic kidney disease. Three alleles of the genes CYP2R1, DHCR7, and GC have been found to be associated with lower vitamin D levels in a large genome-wide association study [10].

Hari Krishna Mata et al have measured vitamin D level and assessed association with Hip fractures. They found that there is no statistically significant correlation between the vitamin D level and hip fractures in males more than 50 yrs (p=0.489) [11].

Conclusion

It is not necessary to perform universal screening of Vitamin D levels in the general population, however those who present with nonspecific musculoskeletal pain and those with elevated levels of serum alkaline phosphatase (500-1000 IU/L among adults), high-risk groups including those with malabsorption, gastric bypass, liver disease, nephrotic syndrome, renal impairment, and patients on drugs affecting vitamin D metabolism should be periodically screened. Awareness to increase sunlight exposure and high intake of vitamin D rich food at mass level and starting of Vitamin D food fortification programs at government level is the need of the hour for curtailing the resurgence of VItamin D deficiency among adults.

References

1. Pettifor, J.M. Rickets and vitamin D deficiency in children and adolescents. Endocrinol Metab Clin North Am. 2005;34:537–553. DOI: http://dx.doi.org/10.1016/j.ecl.2005.04.002.

2. Michael E. Angeline, Albert O. Gee, Michael Shindle, Russell F. Warren, Scott A. Rodeo. The Effects of Vitamin D Deficiency in Athletes ; Am J Sports Med February 2013 vol. 41 no. 2 461-464 DOI: 10.1177/0363546513475787.

3. Holick MF. Vitamin D deficiency. N Engl J Med. 2007;357(3):266-281. DOI: 10.1056/NEJMra070553.

4. Gerome V. Escota, Sara Cross, William G. Powderly. Vitamin D and Calcium Abnormalities in the HIV-Infected Population ;Endocrinol Metab Clin N Am 2014 Sep; 43 (3) 743–767, http://dx.doi.org/10.1016/j.ecl.2014.05.005.

5. Marwaha RK, Gopalakrishnan Sripathy.. Vitamin D and bone mineral density status of healthy schoolchildren in northern India. Indian J Med Res 127, March 2008, pp 239-244.

6. Vieth R. Vitamin D supplementation, 25-hydroxyvitamin D concentrations, and safety. Am J Clin Nutr 1999 May;69(5):842–56.

7. Vieth R. Why the optimal requirement for Vitamin D3 is probably much higher than what is officially recommended for adults. J Steroid Biochem Mol Biol. 2004 May;89-90(1-5):575-9.

8. Yamashita H, Noguchi S, Murakami T, Watanabe S, Uchino S, Ohshima A, Kawamoto H, Toda M (2000) Seasonal changes in calcium homeostasis affect the incidence of postoperative tetany in patients with Graves' disease. Surgery 2000, 127(4):377-382. DOI: 10.1067/msy.2000.104123.

9. Mueller NJ, Fux CA, Ledergerber B, Elzi L, Schmid P, Dang T, Magenta L, Calmy A, Vergopoulos A, Bischoff-Ferrari HA. . High prevalence of severe vitamin D deficiency in combined antiretroviral therapy-naive and successfully treated Swiss HIV patients. AIDS. 2010 May 15;24(8):1127-34. doi: 10.1097/QAD.0b013e328337b161.

10. Wang TJ, Zhang F, Richards JB, et al. Common genetic determinants of vitamin D insufficiency: a genome-wide association study. Lancet. 2010 Jul 17;376(9736):180-8. doi: 10.1016/S0140-6736(10)60588-0.

11. Hari Krishna Mata, Gupta DC, Nataraj A.R. Correlation of serum vitamin D with hip fracturesin males more than 50 years of age. *Int J Med Res Rev* 2015;3(5):478-483. doi: 10.17511/ijmrr.2015.i5.092.

.....

How to cite this article?

Rabindran, Gedam DS. Vitamin D Deficiency among Adults: Recent trends. *Int J Med Res Rev* 2015;3(5):454-455. doi: 10.17511/ijmrr.2015.i5.102.

……