IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
**Research Article**
April 2016 Vol.:6, Issue:1


# Study of Vitamin D Status in the Western Coastal Region of Vasai-Virar City Municipal Corporation (VVCMC), (M.S.), India

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**Submission:** 27 March 2016
**Accepted:** 2 April 2016
**Published:** 25 April 2016

**Keywords:** Vitamin D, deficiency, western, coastal region

**ABSTRACT**

Vitamin D deficiency is becoming very prominent in this area. However, it was observed that very few physicians especially family physicians seemed to be aware of this fact as it is rarely referred. Even the patients visiting pathology laboratories were found to be rarely serious or aware of the consequences of vitamin D deficiency. The objective of this study and analyze the vitamin D levels in the population of VVCMC (Local population).

## INTRODUCTION

Vitamin D refers to a group of fat-soluble secosteroid responsible for enhancing intestinal absorption of calcium, iron, magnesium, phosphate and zinc. In humans, the most important compounds in this group are vitamin $D_3$ also known as cholecalciferol and vitamin $D_2$ ergocalciferol.[1] Cholecalciferol and ergocalciferol can be ingested from the diet and from supplements.[1,2,3] Very few foods contain vitamin D; synthesis of vitamin D (specifically cholecalciferol) in the skin is the major natural sources of the vitamin. Dermal synthesis of vitamin D from cholesterol is dependent on sun exposure (specifically UVB radiation).Vitamin D is photosynthesized in the skin on exposure to UVB rays. Sun exposure alone ought to suffice for vitamin D sufficiency. However, vitamin D deficiency is widely prevalent despite plentiful sunshine even in tropical countries like India. [4]

Vitamin D from the diet or dermal synthesis from sunlight is biologically inactive; activation requires enzymatic conversion (hydroxylation) in the liver and kidney.

Vitamin D deficiency prevails in epidemic proportions all over the Indian subcontinent, with a prevalence of 70–100% in the general population[5]. In India, widely consumed food items such as dairy products are rarely fortified with vitamin D. Indian socio-religious and cultural practices do not facilitate adequate sun exposure. Thereby negating potential benefits of plentiful sunshine. Consequently, subclinical vitamin D deficiency is highly prevalent in both urban and rural settings, and across all socioeconomic and geographic strata.[6] Vitamin D deficiency is likely to play an important role in the very high prevalence of rickets, osteoporosis, cardiovascular diseases, diabetes, cancer and infections such as tuberculosis in India. Fortification of staple foods with vitamin D is the most viable population based strategy to achieve vitamin D sufficiency. [7] during regular referrals of Vitamin D, we realized that the deficiency of Vitamin D in this area was very common. Even though the population in this area was mostly non – vegetarian mostly including fish and poultry products, the deficiency was not uncommon.

Hence we decided to carry out a survey and monitor to evaluate vitamin status in all the patients samples with all age groups were included in the study, right from Children to Adults.

## MATERIALS AND METHODS

The present study was conducted from May 2014 to April 2015. Total 50 cases were referred and subsequently investigated for vitamin D levels and diagnosed as deficient for the same was taken as the study sample without known, thyroid, renal or hepatic disease or malignancy. Purposive sampling was done due to unavailability of substantial data in the western region nearby Mumbai of India pertaining to this study.

Vit-D was measured as 25-OH Vit-D on Chemiluminescent Microparticle Immunoassay (CMIA) from human serum and plasma. The manufacturer recommended reference range of 9.4-52.4ng/ml for males and 9.4-59.4ng/ml for females. During the first incubation, 25 OH Vitamin D is dissociated from its binding protein and binds to the specific antibody on the solid phase. After 10 minutes of the tracer (Vitamin D linked to an isoluminol derivative) is added. After 10 additional 10 minute incubation, the unbound material is removed with a wash cycle. Subsequently, the starter reagents are added to initiate a flash chemiluminescent reaction. The light signals measured with a photomultiplier. Seasonal variation based on exposure to sunlight is likely and hence a target range of 30-40ng/ml was considered as baselines for the purpose of this study.

The records were converted into anonymous sheets and confidentiality of the study subjects was maintained at all the levels of the research. Informed consent was taken from the study participants.

## RESULTS

On conducting the study on 50 patients from various age groups, it was observed that only 8 out of 50 had normal vitamin D levels, 1 out of 50 had high vitamin D level and the remaining 41 out of 50 were either vitamin D insufficient or deficient. It was observed during the study that most of the patients would have to travel to the city for employment. Some of them left their houses for work as early as 4:00 am and returned home by late in the evening. Those who worked nearby mostly wore sun-coats and sunscreen lotions thus preventing the population from direct sun exposure. This leads to more bone fracture cases in the area than ever before. People have developed the tendency to get a fracture even during minor fall. A majority of patients are

having knee degradation thus forcing them to undergo total knee replacement (TKR). A lot of people are also seen to have a hip fracture even after a minor fall. The need to study the vitamin D levels hence aroused. During the study it was observed that the percentage of Vitamin D deficient patients was 4% (vitamin D < 10 ng/ml), Vitamin D insufficient was 78% (vitamin D between 10 – 30 ng/ml) , Vitamin D sufficient was 16% (Vitamin D levels between 30 – 100ng/ml) , and hypervitaminosis was 2% (Vitamin D levels > 100 ng/ml). In this particular area, the least Vitamin D levels were found in men in the age group of 30 – 40 which was dominantly a working age group whereas in females the age group with Vitamin D insufficiency was 20 – 30 which were working class age group as well as females of childbearing age group.

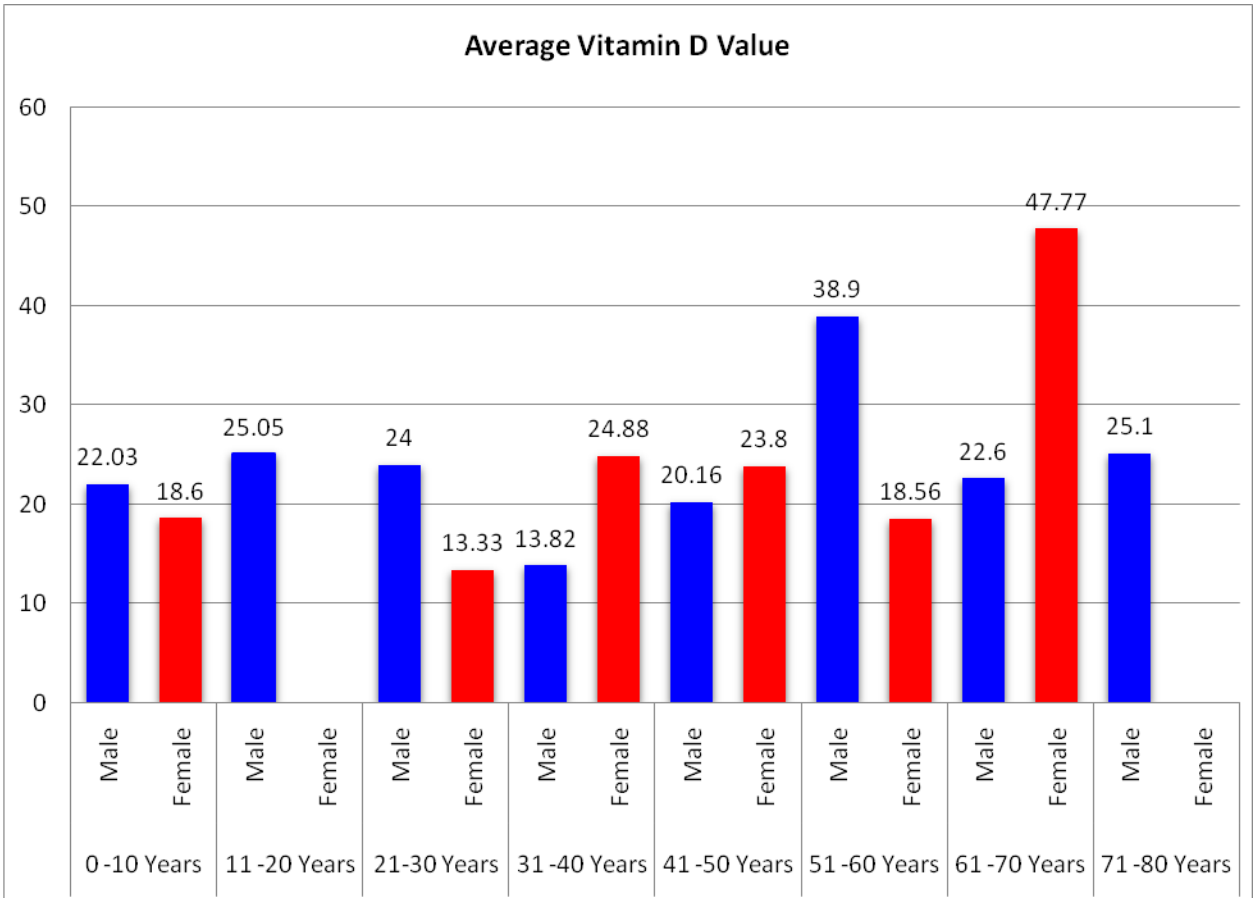


**Table.1 Showing Average Vitamin D Values in different age groups**

## DISCUSSION

It has been estimated that 1 billion people worldwide have Vitamin D deficiency or insufficiency[4]. There is the widespread prevalence of varying degrees (50- 90%) of Vitamin D deficiency with low dietary calcium intake in the Indian population according to various studies published earlier [5,6,8,9].

Vitamin D deficiency is on a rise as a major problem in India due to unawareness. In the present study, joint pain was the major complaint among males followed by muscle pain and history of recurrent fractures. We have also observed that patients with a history of recurrent fractures and osteoporosis are associated with significantly low levels of Vit-D. Most of the Vit-D deficient women were suffering from osteoporosis and anaemia. Although anaemia can be attributed to menstruation during this age group, the high prevalence of osteoporosis during premenopausal period is a major concern. A sizeable proportion of women with Vit -D deficiency (mean level- 4.8ng/ml) was also being investigated for possible carcinomatosis. The relationship between musculoskeletal disorder and Vit-D deficiency is well established. Several lines of evidence suggest that vitamin D deficiency may be a risk factor for cardiovascular, cancer and all-cause mortality. Ecological studies reveal that CVD events are higher in the winter when vitamin D levels are lower and cancer survival is better if the cancer is diagnosed in [8, 9] the summer when vitamin D levels are higher. High prevalence of vitamin deficiency exists in Jammu region among healthy population[8].

It is unclear why the association between 25(OH) D levels and morbidity are more pronounced amongst women. It may be that there is a hormone interaction between estrogens and 25(OH) D[11]. Therefore, the findings in a comparatively younger population can be attributed to sedentary lifestyle, or a diet deficient in Vit-D along with inadequate exposure to sunlight. Epidemiologic studies have shown an association between vitamin deficiency and increased risk of chronic diseases, such as cancer, cardiovascular disease, type 2 diabetes, and autoimmune diseases, such as multiple sclerosis and type 1 diabetes mellitus[12]. Similarly, more than half of the patients were screened for Vit-D levels only after three visits to their physicians are a concern not only to the patients but points towards a want of suspicion amongst the clinician in this part.

## CONCLUSION

During study, it was observed that around 82% of the population had either deficient or insufficient levels of Vitamin D. Awareness of consequences of Vitamin D deficiency needs to brought to light. Physicians need to be made aware of the necessity of prescribing Vitamin D tests and then to give Vitamin D supplements.

## REFERENCES

1. Holick MF. "High prevalence of vitamin D inadequacy and implications for health". *Mayo Clin. Proc.* (March 2006) **81 (3):** 353–73. doi:10.4065/81.3.353. PMID 16529140.
2. Calvo MS, Whiting SJ, Barton CN; Whiting; Barton. "Vitamin D intake: a global perspective of current status". *J. Nutr.* (February 2005) **135 (2):** 310–6. PMID 15671233.
3. Norman AW. "From vitamin D to hormone D: fundamentals of the vitamin D endocrine system essential for good health". *Am. J. Clin. Nutr.* (August 2008) **88 (2):** 491S–499S. PMID 18689389.
4. Mukherjee B.,Patra S., Sahoo S.. Evaluation of Vitamin D status in Urban population Employed in Office Jobs. *IOSR Jour. Of Dental and Medical Sciences (iosr-jdms)* e-ISSN: 2279-0853,P-ISSN:2279-0861. (2015) **14(6):** Ver-1-18-20 (Jun.2015).
5. Muley Arti and Uma Iyer.A pilot study on Vitamin-D status and Metabolic syndrome in Indian adult population. *Int.Jour. Appl.Sci and Biotechnol*. (2014) **2920:**126-131.
6. Ritu G and Ajay Gupta. Vitamin D Deficiency in India: Prevalence, Causalities and Interventions. *Nutrients.* Feb;. (2014) **6(2):** 729–775. doi: 10.3390/nu6020729PMCID: PMC3942730
7. Harinarayan CV, Joshi SR. Vitamin D status in India-Its implications and Remedial Measures. *J Assoc Physicians India*; (2009).**57:** 40-48.
8. Raina K., Verma H.N. , A. S. Bhatia. Prevalence of Vitamin D Deficiency in Jammu Region. *JK Science* 16(1) :21-23 (Jan-March, 2014).
9. ChopraB, Singh S,Singh KIs there a need to reassess reference level of vitamin D for India? -A Priliminary survey of vitamin D level in the normal population of Punjab.*Int.Jou. Sci.and Res (IJSR).*(2015). **4(1):** 1246-1248.
10.Lim HS, Rouchoudhuri R, Peto J, Schwartz G, Baade P, Moller HCancer survival is depended on season of diagnosis and sunlight exposure. *Int. J Cancer*. (2006). **119(7):**1530-1536.
11. Melamed ML, Michos ED, Post W, Astor B. 25 hydroxyvitamin D level and the risk of mortality in the general population..*Arch Intern Med*. (2008). 168(15): 1629-1637.
12. Dawson-Hughes B, Heaney RP, Holick MF, Lips P, Meunier PJ, Vieth R. Estimate of optimal vitamin D status. *Osteoporos Int*. (2005) **16:**713-716.