

Original Research Article

High prevalence of vitamin D deficiency in school children in Jammu: a whistle blower

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ABSTRACT

Background: Vitamin D deficiency prevails in epidemic proportions among school going children in India, but there is scarcity of searchable data on vitamin D status in school children in Jammu and Kashmir; hence we have assessed the vitamin D status in school going children attending outpatient department in a tertiary care hospital Jammu.

Methods: The study was conducted in the department of Biochemistry Government Medical College Jammu during June to December, 2018 and after obtaining informed consent, a total of 104 school going children between the age group of 6 years to 12 years, attending SMGS Hospital Jammu were screened for their vitamin D (25 OH-D) status by using Abbott architect chemiluminescent micro particle immunoassay.

Results: Out of a total of 104 school going children screened in the study, 91 (87.5%) were found to be having insufficient vitamin D levels in their blood (<30ngm/dl) whereas 63 (60.5%) children showed severe deficiency with vitamin D levels below 20ngm/dl.

Conclusions: Despite of abundant sunshine throughout the year and also with the consideration that people of this region are well off economically and can afford good nutrition, the results of our study revealing high prevalence of Vitamin D deficiency in school going children can be taken as a whistle blower for the health policy makers of the region.

Keywords: Jammu, Prevalence, School children, Vitamin D, Vitamin D deficiency

INTRODUCTION

Vitamin D also known as, 'the Sun Shine Vitamin' is an important metabolic regulator with unique steroid hormone like activities. In spite of the fact that 90% of vitamin D can be synthesized endogenously in the skin by exposure to sun light, yet vitamin D deficiency is pandemic and remains the most under diagnosed and under treated nutritional deficiency in world.¹⁻³ Low dietary intake and poor exposure to sunlight are common causes of vitamin D deficiency in general population. The most preferred and commonly used parameter for assessment of vitamin D status in serum is 25 (OH) D levels. It is the major circulating metabolite of vitamin D

and also reflects the endogenous synthesis in skin along with dietary intake⁴. The active form of vitamin D, 1, 25 dihydroxy D influences the expression of a wide variety of genes which regulates cell growth and cellular differentiation and acts as a potent antioxidant protecting against free radical damage and is an effective inducer of cellular differentiation. Vitamin D is essential not only for skeletal growth but also for improving immune status in children and its deficiency is likely to play an important role in the very high prevalence of rickets, osteoporosis, cardiovascular diseases, diabetes, autoimmune disorders, cancer and infections such tuberculosis in India.^{5,6} However, as these diseases are multi factorial, optimum vitamin D levels may not

prevent these diseases but it can help in lowering their risks.

Deficiency of vitamin D has been well documented in school children in many parts of the country, but there is scarcity of searchable data on prevalence of vitamin D deficiency in these children in J and K, hence this study was undertaken to assess vitamin D status in school going children in this hilly state of Jammu and Kashmir.

METHODS

The study was conducted in the department of Biochemistry Government Medical College Jammu from the month of June, 2018 to December 2018 and a total of 104 school going children between the age group of 6 years to 12 years attending SMGS Hospital Jammu were screened for their vitamin D (25 OH-D) status. Blood samples were obtained from antecubital vein under aseptic conditions from each child, duly following the guidelines and norms of the hospital and serum obtained from this was taken for vitamin D level by using Abbott architect chemiluminescent microparticle immunoassay.⁷ The cut off value of vitamin D (25 OH-D) levels below 20ngm/ml (<50nmol/L) was considered as severe vitamin D deficiency, 20-30ngm/ml (50-75nmol/L) as insufficiency levels and levels more than 30ngm/ml (>75nmol/L) was taken as vitamin D sufficiency.

Children with previous history of diabetes mellitus, thyroid disorder, cardiovascular disorder, metabolic bone disorder were excluded from this study. The results were analyzed by applying standard statistical procedures.

RESULTS

A total of 104 school going children were screened for vitamin D (25 OH-D) levels in their blood and 91 (87.5%) of these children were found to have insufficient levels of vitamin D (<30mg/dl), whereas 63 (60.5%) children had vitamin D levels below 20ngm/ml, the mean level was 10.8ngm/ml, 28 (26.9%) were having vitamin D level between 20-30ngm/ml with a mean value of 22.5ngm/dl. Only 13 out of 104 (12.5%) of the school going children were having levels above 30ngm/ml with the mean value 42.7ngm/ml. Amongst 104 school going children screened, 48 were boys and 56 were girls. Out of these 48 boys, 25 (52%) were having severe deficiency with levels below 20ngm/ml, whereas 16 (33.3%) and 07 (14.5%) school children had blood levels between 20-30ngm/ml and above 30ngm/ml respectively. Out of 56 girls screened, 38 (67.8%) were severely deficient having vitamin D levels below 20ngm/dl, further 12 (21.4%) and 06 (10.7%) out of these 56 school girls had levels between 20 to 30ngm/dl and above 30ngm/dl respectively. The lowest values of vitamin D were 5.9ngm/ml in boys and 2.9ngm/ml in girls.

Table 1: Prevalence of vitamin-d deficiency among 6-12 years of age school going children.

Study subjects	25 (OH) D Status		
	Deficient <20ngm/ml	Insufficient 20-30ngm/ml	Sufficient >30ngm/ml
Total subjects			
n = 104	63 (60.5%)	28 (26.9%)	13 (12.5%)
Mean value			
25 (OH) D ngm/ml	10.8	22.5	42.7
Gender			
Boys (n = 48)	25 (52%)	16 (33.3%)	07 (14.5%)
Girls (n= 56)	38 (67.8%)	12 (21.4%)	06 (10.7%)

DISCUSSION

Vitamin D deficiency has assumed a shape of pandemic, yet it is the most under diagnosed and under treated nutritional deficiency in the world.⁸ Vitamin D deficiency has been well documented in school going children in other parts of the country, but there is scarcity of searchable data on the prevalence of vitamin D deficiency in school going children in Jammu and Kashmir. This study showed a very dismissal picture of alarming high prevalence of vitamin D deficiency in otherwise healthy school going children in this hilly state of Jammu and Kashmir.

In this study, A total of 104 school going children in the age group of six years to twelve years of age were screened for vitamin D levels in their blood and surprisingly a total of 91 (87.5%) children were found to have insufficient levels of vitamin D in their blood. Khadgwat et al, have also reported similar findings, where it was found that 92.3% school going children had vitamin D concentration <20ngm/ml in accordance with our findings.⁹ In our study 85.4% of boys and 89.2% girls were found to have below normal values, but the severity of vitamin D deficiency with cut off value below 20ngm/dl was higher in girls (67.8%) as compared to only 52% in boys. Similar results have been reported in a study conducted by Khadikar et al amongst school girls

with a prevalence of 25(OH) D deficiency in 70% girls with mean serum values as less as 12ngm/ml.¹⁰ Whereas no significant difference was seen in serum 25(OH)D levels between boys and girls in a another study study.¹¹

In accordance with this study, many studies have shown that despite of having so many sunny days in India throughout the year, vitamin D deficiency is highly prevalent in our country irrespective of their age group and gender.¹²⁻¹⁵ In a study conducted in North India (27°N), 91% of healthy school girls were found to have hypovitaminosis D, findings similar to the results shown in our study.¹⁶

Inadequate sun exposure along with ever increasing air pollution contributes significantly to vitamin D deficiency in school going children. Overindulgence in indoor games, internet addiction and over protective attitude of parents, in not allowing the children to play outdoor games are other significant contributing factors which need to be studied in detail in the present scenario of high tech internet based childhood.

CONCLUSION

The analysis revealed a high prevalence of vitamin D deficiency in among young children aged six to twelve years, despite of abundant sunshine throughout the year and also with the consideration that people of this region are well off economically and can afford good nutrition, It is highly suspected that vitamin D deficiency may represent other underlying public health problem in Jammu and Kashmir that should be explored. The results of our study revealing prevalence of alarming level of vitamin D deficiency in school going children should be taken as a whistle blower for the health policy makers of the region.

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REFERENCES

1. Van Schoor NM, Lips P. Worldwide vitamin D status. *Best Pract Res Clin Endocrinol Metab.* 2011;25:671-80.
2. Mithal A, Wahi D A, Bonjour JP, Burkhardt P, Dawson-Hughes B, et al. Global vitamin D status and determinants of hypovitaminosis D. *Osteoporos Int.* 2009;20:1807-20.
3. Vander Meer IM, Middelkoop BJ, Boek AJ, Lips P. Prevalence of vitamin D deficiency among Turkish, Moroccan, Indian and Sub Saharan African populations in Europe and their countries of origin: An overview. *Osteoporos. Int.* 2011;22:1009-21.
4. Prentice A, Goldberg GR, Schoenmakers I. Vitamin D across the lifecycle: Physiology and biomarkers. *Am J Clin Nutr.* 2008;88(2):500SS-506S.
5. Bartoszewski M, Kamboj M, Patel DR. Vitamin D, muscle function and exercise performance. *Pediatric Clin North Am.* 2010;57:849-61.
6. Walker VP, Modilin RL. The vitamin D connection to pediatric infections and immune function. 2009;65:106R-113 R.
7. National Committee for Clinical Laboratory Standards. Procedures for handling and processing of blood specimens; approved guidelines- third edition. NCCLS Document H18-A3; Wayne (PA); NCCLS; 2004.
8. Ritu G, Ajay Gupta. Vitamin D deficiency in India: Prevalence, causalities and interventions. *Nutrients* 2014;6(2):729-75.
9. Khadgawat R, Marwaha RK, Tandon N, Mehan N, Upadhyay AD, Sastry A, Bhadra K. Percentage body fat in apparently healthy school children from northern India. *Indian pediatrics.* 2013 Sep 1;50(9):859-66.
10. Khadikar A, Das G, Sayyad M, Sanwalka N, Bhandari D, Khadikar V, et al. Low calcium intake and hypovitaminosis D in adolescent girls. *Arch Dis Child.* 2007;92(11):1045.
11. Puri S, Marwaha RK, Agarwal N, Tondon N, Agarwal R, Grewal K, et al. Vitamin D status of apparently healthy school girls from two different socioeconomic strata in Delhi. *Br J Nutr.* 2008;99(4):876-82.
12. Marwaha RK, Tondon N, Agarwal N, Puri S, Agarwal R, Singh S, et al. Impact of two regimens of vitamin D supplementation on calcium- Vitamin D- PTH axis of school girls of Delhi. *Indian Pediatr.* 2010;47(9):761-9.
13. Mehlaawat U, Singh P, Pande S. Current status of Vitamin-D deficiency in India. *Innovat Pharma Pharmacother.* 2014;2(2):328-35.
14. Ritu G, Ajay Gupta. Vitamin D deficiency in India: prevalence, causalities and interventions. 2014;6(2):729-75.
15. Bachhel R, Singh NR, Sidhu JS. Prevalence of vitamin D deficiency in north-west Punjab population: A cross-sectional study. *Int J App Basic Med Res.* 2015 Jan;5(1):7.
16. Malhotra N, Mithal A. Vitamin D status in Asia. International Osteoporosis Foundation. Available at: <http://www.iofbonehealth.org/sites/default/files/PDFs/Vitamin-D-Asia.pdf>.

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