ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 03 | March - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF VITAMIN D DEFICIENCY IN SCHOOL GOING CHILDREN

Paediatrics

Dr. Shubhi Agarwal* Senior Resident, Department of Paediatrics, United Institute of Medical Sciences, Prayagraj, U.P. *Corresponding Author

Dr. Sagar Senior Resident, Department of Orthopaedics, United Institute of Medical Sciences, Prayagraj, U.P.

Dr. Sakshi 2nd Year Resident, Department of Radiodiagnosis, Sri Aurobindo Institute of Medical Sciences, Indore, M.P.

Dr. K. Sai Kishore 3rd year Resident, Department of Paediatrics, Dr KNS Memorial Institute of Medical Sciences, Gadia, Barabanki, U.P.

Dr. Mohd. Kashif Professor, Department of Paediatrics, Dr KNS Memorial Institute of Medical Sciences, Gadia, Barabanki, U.P.

ABSTRACT

Background & Objectives- Vitamin D deficiency is the most often untreated nutritional deficit. It is advised to test school-going children for vitamin D insufficiency as they are more susceptible to the condition and the resulting impairment of bone mineralization. Thus the objective of the present study is to find out the prevalence of Vitamin D deficiency in school going children. **Methods-** 100 school going children in all were enrolled after receiving permission from their parents or legal guardians. Measured serum 25(OH)D levels were categorised as inadequate, sufficient, and deficient. **Results-** 63 people were determined to be vitamin D deficient, 22 to be inadequate, and 15 to be sufficient. Females, living in cities, being overweight, having dark skin, not participating in sports and not spending enough time in the sun were all associated with vitamin D insufficiency and inadequate levels. Encouragement of outdoor and athletic exercise, regular monitoring of vitamin D levels, and treatment of low levels. **Interpretation & Conclusion-** Given how sensitive this population of school going children is, physical activity and sun exposure-especially in urban areas-are vital to preventing this deficit. Vitamin D should be supplemented to the vulnerable group as defined in our study so as to safeguard and promise a happy and healthy lifestyle.

KEYWORDS

25(OH)D, Adolescents, Hypovitaminosis D, School Children, Vitamin D Deficiency.

INTRODUCTION–

Although vitamin D insufficiency is widespread, it is the dietary deficiency that is least frequently recognised and addressed [1-3]. Regardless of age, gender, colour, or location, vitamin D insufficiency is common in people.

Early in the 20th century, vitamin D was categorised as a vitamin, and in the second half, as a prohormone. Anti-ricket factor or sunlight vitamin are the traditional names for it. It may be produced endogenously (in the skin), it acts as a hormone, and it is a fat-soluble vitamin, making it a special nutrient [2,4].

Both skeletal and non-skeletal disorders are affected by vitamin D deficiency [5]. India has a lot of sunlight, but hypovitaminosis is widespread too.

People who are socioeconomically disadvantaged make up a sizable portion of the Indian population. Poor nutrition is typically a problem for the less fortunate. For the majority of Indians, there are few and expensive dietary sources of vitamin D. Although there are vitamin D supplements available, the majority of Indians are unaware that they require more vitamin D. Furthermore, the majority of people find the expense of these supplements to be practically unaffordable [5].

The World Health Organization defines the 10-19 years age group as adolescent, 15-24 age group as youth and 10-24 age group as young people [6].Young age and adolescence are risk factors for vitamin D deficiency, which is known to affect more females than males [7, 8].

MATERIALAND METHODS

The prospective longitudinal interventional based study was conducted for a period of 2 years. A total of 100 patients were enrolled after taking permission from the Ethics Committee.Height, weight were measured and BMI was calculated. BMI levels classified as underweight (< 18, 5), normal (18, 5-24, 99), overweight (≥ 25) and obese (> 30).Vitamin D i.e. 25(OH)D, testing is carried out utilizing CLIA technology in a fully automated analyser Advia Centaur.

Inclusion criteria –

Patients of either sex
Patients of age group 10-19yr
Signs of Vitamin D deficiency (low backache, lethargy, muscle weakness, fatigue, any signs of bowing of legs)
Parents/Legal Guardian giving consent for the study

Exclusion criteria –

Patients suffering from various diseases
Patients on palliative treatment
Patients with neurological deficit
Parents not willing to participate in the study

RESULTS-

(Table 1)

33 males and 67 females made up the study population, which had a mean age of 12.46 + 0.96 years. With an interquartile range of 12.78 to 28.7 ng/ml, the median vitamin D level was 17.95 ng/ml. In the research population, 28 people were from rural areas and 72 people were from urban. Only 15 of the participants in the research had enough amounts of vitamin D, while 22 had inadequate levels and 63 had deficits. A substantial risk factor for vitamin D deficiency and insufficiency was identified to be female gender. Insufficiency or deficit was seen in 61 (92.04%) of the 67 females and 24 (72.72%) of the 33 males.

Out of 33 males, 24 (72.72%) exhibited deficit or insufficiency, and out of 67 females, 61 (92.04%) had as well. 42 (58.3%) of the 72 individuals in the urban area had vitamin D deficiency, while 21 (29.1%) had insufficiency.16 (57.14 %) of rural area participants had vitamin D deficiency and 6 (21.4 %) had insufficiency. High frequency of vitamin D insufficiency and deficiency was substantially correlated with living in an urban area. As a result, 6 (8.3%) of the rural areas had normal levels, whereas 9 (32.14%) of the urban areas did. 50 of the study population participated in sports, 66 had dark skin, 69 spent less than 60 minutes in the sun, and 59 out of 100 in the study did not consume milk.

DISCUSSION

A study was carried out among school going children, with 100 participation. Within the study sample, 15 people had normal blood vitamin D levels, whereas 85 people either had vitamin D deficiency or insufficiency. According to Anitha et al. [9], 8.62% of school-aged children had adequate vitamin D levels, whereas the remaining

children either had vitamin D deficiency or insufficiency. Due to increased demand in this age range, vitamin D deficiency is significantly more common. Other researchers have documented a higher frequency of vitamin D insufficiency in adolescents [10,11].
In the current study, 72.72% of males and 92.04% of females had deficiencies or insufficiencies. 90.8% of schoolgirls had hypovitaminosis D, according to Puri S et al [12]. Females were shown to have a greater frequency of vitamin D insufficiency, according to Vasudevan J et al [13]. Both Harinarayan et al. [14] and Vupputuri et al. [15] revealed that urban dwellers had a greater prevalence of hypovitaminosis. Vitamin D insufficiency was shown to be more prevalent in females, according to Moore C et al [7] and Rockell JE et al [8]. Additionally, it has been noted that anorexia also has low vitamin D levels.

The risk of fracture is increased in healthy adolescents with low calcium intake and high BMI. Even though the production of vitamin D varies according to seasons, altitude and skin pigmentation; legs and arms should be exposed to sunlight for 5 to 30 minutes between 10:00 AM and 03:00 PM twice a week to for appropriate production of vitamin D [17].

One of the reasons why vitamin D deficiency or insufficiency is more common in females may be related to their decreased sun exposure from wearing clothes that covers their skin and their restricted access to outdoor activities due to cultural or security concerns. Because of compact homes and flat systems, urban inhabitants are more likely to suffer from hypovitaminosis, which may be caused by a lack of exposure to sunlight or access to green places.

CONCLUSION-

Since Vitamin D and calcium deficiency go hand in hand, so it is very important to look for warning signs and start vitamin D supplementation along with calcium supplements. Given how sensitive this population of school going children is, physical activity and sun exposure—especially in urban areas—are vital to preventing this deficit. Early warning signs should not be disregarded and medical attention should be sought prophylactically. Vitamin D should be supplemented to the vulnerable group as defined in our study so as to safeguard and promise a happy and healthy lifestyle.

Acknowledgement- We thank all parents for their consent to participate in the study.

Financial Support - None

Conflicts Of Interest-None

Table 1- Results

Clinico – Social Characteristics	N
Age group	10-19 years, mean- 12.46±0.96 years
Gender	Males – 33 Females - 67
Residence	Urban- 72 Rural – 28 p= 0.001
Serum 25(OH) D levels	Deficit- 63 Insufficient- 22 Sufficient – 15 p= 0.002
Height	136 – 170cm, Mean – 153cm p= 0.435
Weight	25-75kg p=0.042
BMI	Min- 13.85, max- 25.95 p=0.042
MILK CONSUMPTION	Yes – 41 No - 59 p= 0.039
DIET	Veg- 52, mix- 48 p= 0.562
SKIN COLOUR	Dark – 66 Light- 34 p=0.004
TIME SPENT IN SUN	<60 min – 69 >60 min – 31 p=0.001
DOING SPORTS	Yes – 50 No- 50 p= 0.631

REFERENCES-

1- Cannell JJ, Hollis BW, Zasloff M, Heaney RP (2008) Diagnosis and treatment of vitamin D deficiency. Expert OpinPharmacother 9: 107-118.
2- Holick MF (2007) Vitamin D deficiency. N Engl J Med 357: 266-281.
3- Holick MF (2006) High prevalence of vitamin D inadequacy and implications for health. Mayo Clin Proc 81: 353-373
4- DeLuca HF. Overview of general physiologic features and functions of vitamin D. Am J Clin Nutr. 2004;80:1689S-6S
5- G R, Gupta A. Vitamin D Deficiency in India: Prevalence, Causalities and Interventions. *Nutrients*. 2014; 6(2):729-775
6- http://www.euro.who.int/document/e81703.pdf
7- Moore C, Murphy MM, Keast DR, Holick MF (2004) Vitamin D intake in the United States. J Am Diet Assoc 104: 980-983.
8- Rockell JE, Green TJ, Skeaff CM, Whiting SJ, Taylor RW, et al. (2005) Season and ethnicity are determinants of serum 25-hydroxyvitamin D concentrations in New Zealand children aged 5-14 y. J Nutr 135: 2602-2608.
9- Anitha A, Poovathinall SA, Viswambharan V, Thanseem I, Vasu MM, Ranjitha M. Cross-Sectional study reveals a high prevalence of vitamin D deficiency among healthy school children in central Kerala, India. Int J ContempPediatr. 2019; 6 (2): pp867-71
10- Vasudevan J, Reddy GMM, Jenifer A, Thayumanavan S, Devi U, Rathinasamy M. Prevalence and factors associated with vitamin D deficiency in Indian Children: A hospital based Cross-Sectional study. PediatricOncall Journal. 2014; 12 (3). 71-6
11- Basu S, Gupta R, Mitra M, Ghosh A. Prevalence of vitamin D deficiency in a pediatric hospital of Eastern India. Ind J Clin Biochem. 2015; 30 (2): 167-73.
12- Puri S, Marwaha RK, Agarwal N,TandonN,Aarwal R, Grewal K. Vitamin D status of apparently healthy schoolgirls from two different socioeconomic strata in Delhi: relation to nutrition and lifestyle. Br J Nutr. 2008; 99:876-882.
13- Vasudevan J, Reddy GMM, Jenifer A, Thayumanavan S, Devi U, Rathinasamy M.Prevalence and factors associated with vitamin D deficiency in Indian Children: A hospital based Cross-Sectional study. PediatricOncall Journal. 2014; 12 (3). 71-6
14- Harinarayan CV, Ramalakshmi T, Prasad UV, Sudhakar D. Vitamin D status in Andhra Pradesh: a population based study. Indian J Med Res. 2008; 127(3):231–8.
15- Vupputuri MR, Goswami R, Gupta N, Ray D, Tandon N, Kumar N, et al. Prevalence and functional significance of 25-hydroxyvitamin D deficiency and vitamin D receptor gene polymorphism in Asian Indians. Am J Clin Nutr 2006; 83:1411-9
16- Watanabe D, Hotta M, Ichihara A (2015) Osteomalacia, severe thoracic deformities and respiratory failure in a young woman with anorexia nervosa. Intern Med 54: 929-934
17- Kardelen AD, Yildiz I, Omer B, Oguz F (2018) Serum 25(OH) Vitamin D Levels of Adolescent and Young Medical Students. Int J Pediatr Res 4:032. doi.org/10.23937/2469-5769/1510032