

Original Research Article

Vitamin D deficiency: how prevalent it is?

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ABSTRACT

Background: Vitamin D deficiency is frequently seen nowadays due to inadequate exposure to sun and pollution. The present study was undertaken to evaluate the prevalence of vitamin D deficiency in patients presenting with suggestive complaints.

Methods: The present study is a retrospective study done at Srinivas Institute of Medical Sciences and Research Centre, Mukka, Suratkal, Mangaluru. Patients who have musculoskeletal or other problem suggestive of vitamin D deficiency were advised vitamin D levels. We went through OPD papers of only those patients with reports of Vitamin D levels.

Results: In present study, out of 100 patients, 42 (42%) patients had normal BMI, 23 (23%) patients were overweight, 24 (24%) patients were obese while 11 (11%) patients were underweight. 46 (46%) patients were having walk for exercise purpose, 21 (21%) were doing work out at gym while 33 (33%) patients were walking only for doing some work. 47 (47%) patients had normal levels of vitamin D, 31 (31%) had insufficient levels while 22 (22%) patients had deficient levels of vitamin D. So, prevalence of vitamin D deficiency was 22% and for vitamin D insufficiency was 31%.

Conclusions: In present study, we conclude that irrespective of normal body mass index or physical activity, patients presented with various complaints. In them, vitamin D levels were either insufficient or deficient in large number of patients. So, vitamin D levels should be done as screening or at least when patients present with suggestive complaint.

Keywords: Vitamin D levels, Body mass index, Physical activity

INTRODUCTION

Vitamin D deficiency is prevalent all over the world. But it is very infrequently diagnosed and so under-treated nutritional deficiency in the world. Vitamin D deficiency is seen in all age groups, gender, race and all geographic regions. Though sunshine is enough in tropical countries like India, Vitamin D deficiency is widely prevalent.¹

Vitamin D deficiency impairs bone mineralization, causing bone softening diseases like rickets in children. It can also worsen osteomalacia and osteoporosis in adults.

Thus leading to an increased risk of bone fractures, muscle weakness is also a common symptom of vitamin D deficiency. This further increasing the risk of fall and bone fractures in adults.²

Most common cause of vitamin D deficiency is inadequate exposure to sunlight with adequate ultraviolet B rays.²

Other causes of Vitamin D deficiency are inadequate nutritional intake of vitamin D, disorders limiting vitamin D absorption, and conditions impairing vitamin D

conversion into active metabolites like certain liver, kidney and hereditary disorders.³

Deficiency vitamin D is diagnosed by measuring the levels of serum 25-hydroxyvitamin D. It is considered as the most accurate measure to assess the stores of vitamin D in the body.³

Vitamin D levels are categorized as:⁴

- Deficiency: <20 ng/ml
- Insufficient: 20–29 ng/ml
- Normal: 30–100 ng/ml

The amount of vitamin D recommended in U.S. and Canada in 2016 is 400 IU per day for children, 600 IU per day for adults, and 800 IU per day if the person is above 70 years of age.⁵

In NHANES study, it was found that 8% people were at risk for very low 25 (OH) D levels (<12 ng/ml) from 2001 to 2006. 25% people were at risk for deficiency (serum 25 (OH) D levels of 12 to 20 ng/ml).⁶

Cardiovascular diseases are associated with vitamin D deficiency as found in the various epidemiological observational studies.⁷

Inverse relation of 25 (OH) D levels and calcium status with insulin resistance and hyperglycemia has been found in a meta-analysis of observational studies. Here, supplementation with both the nutrients combined showed benefit in optimizing glucose levels.⁸

When 25 (OH) D levels were <20 ng/ml there was a 30–50% increased risk of development and death due to colorectal, prostate, breast, pancreatic, and esophageal cancer as found in retrospective and prospective epidemiologic studies.⁹

There are various options available for individual to give supplements of vitamin D. It includes capsules, chewable tablets, liquids, and drops. A good source of vitamin D is cod liver oil. But if it is given in large doses, there is a risk of vitamin A toxicity.¹⁰

Aims and objectives are to impress upon about the gravity of the vitamin D deficiency problem throughout India, and to appeal the health ministry, and the food and nutrition board in India for population based strategy of fortification of staple foods with vitamin D.

METHODS

The present study is a retrospective study done from 1st December 2018 to 31st January 2019 at Srinivas Institute of Medical Sciences and Research Centre, Mukka, Suratkal, Mangaluru. It is a tertiary care centre. Usually vitamin D levels are not done routinely here because they are not available free of cost or at subsidized rate. So

patients who have musculoskeletal problems or any other problem where vitamin D deficiency can be there were advised vitamin D levels. We went through OPD papers of only those patients who came with reports of Vitamin D levels.

Inclusion criteria

Inclusion criteria are patients with some or other complaint who have done vitamin D levels, patients who were ready to participate in this study and patients of all ages and sex.

Exclusion criteria

Exclusion criteria are patients not willing to participate in the study and patients who have not done vitamin D levels

Other data like age, sex, socioeconomic status, body mass index, level of physical activity, type of physical activity was also noted.

Data was analyzed. Statistics was taken in percentages.

RESULTS

In present study, out of 100 patients, (22%) patients were of 3 months-10 years, (9%) were of 11-20 years, (14%) were of 21-30 years, and (22%) were of 31-60 years while 33 (33%) patients were of more than 60 years of age.

So, almost equal patients were from 3 months to 10 years and 31-60 years age group. More number of patients were above 60 years of age. Number of male and female patients was almost equal (Table 1).

Table 1: Age and sex distribution.

Characteristics	Percentage of patients
Age distribution	
3 months to 10 years	22
11 years to 20 years	9
21 years to 30 years	14
31 to 60 years	22
More than 60 years	33
Sex distribution	
Males	49
Females	51

In present study, out of 100 patients, (42%) patients had normal BMI, (23%) patients were overweight, (24%) patients were obese while (11%) patients were underweight. So, more number of patients had normal body mass index (Table 2).

In present study, (46%) patients were having walk for exercise purpose, (21%) were doing work out at gym

while (33%) patients were walking only for doing some work. So, more than half patients were doing proper exercise (Table 3).

Table 2: Body mass index.

Body mass index	Percentage of patients
Normal	42
Underweight	11
Overweight	23
Obese	24

Table 3: Type and level of physical activity.

Type and level of physical activity	Percentage of patients
Walk for exercise	46
Working in gym	21
Walk for routine work	33

In present study, some patients had more than one complaint. (53%) patients came with backache, (22%) patients had whole body ache, (44%) had pain in muscles, (25%) had alopecia, (21%) had repeated fall or fractures while (3%) patients had muscular chest pain.

Table 4: Complaints of patients.

Complaints of patients	Percentage of patients
Back ache	53
Body ache	22
Pain in the muscles	44
Child not sitting properly	18
Alopecia Repeated fractures	25
Repeated fall	21
Muscular chest pain off and on	3

Parents who brought their children complained that their child is not sitting properly 18 (18%). So, backache and muscular pain were chief complaints (Table 4).

In present study, (47%) patients had normal levels of vitamin D, (31%) had insufficient levels of vitamin D while (22%) patients had deficient levels of vitamin D.

So, though almost half patients had normal levels, half patients had either insufficient or deficient levels of vitamin D (Table 5).

Table 5: Vitamin D levels.

Vitamin D levels	Percentage of patients
Normal: 30–100 ng/ml	47
Insufficient: 20–29 ng/ml	31
Deficiency: <20 ng/ml	22

DISCUSSION

In present study, out of 100 patients, (22%) patients were of 3 months-10 years, (9%) were of 11-20 years, (14%) were of 21-30 years, (22%) were of 31-60 years while (33%) patients were of more than 60 years of age.

Number of male and female patients was almost equal (Table 1).

Contrary to our study, Orwoll et al found that patients in their study were from 65–99 years. Average age in this study was found to be 73.8±5.9 years.¹¹

In present study, out of 100 patients, (42%) patients had normal BMI, (23%) patients were overweight, and (24%) patients were obese while (11%) patients were underweight (Table 2).

Similar to our study, Orwoll et al found that in patients where BMI was normal, 21% had 25 (OH) D levels below 20 ng/ml. In patients with BMI in the category of overweight, 24.5% had vitamin D deficiency. 33.6% people had vitamin D deficiency and 4.3% had levels below 10 ng/ml in patients with BMI in the category of obese. 53.3% people were deficient who were morbidly obese.¹¹

In present study, (46%) patients were having walk for exercise purpose, (21%) were doing work out at gym while (33%) patients were walking only for doing some work (Table 3).

Contrary to our study, Orwoll et al found that in persons who had higher activity level had higher 25 (OH) D levels. For persons who had less activity level, total 25 (OH) D was 23.2 ng/ml, and 35.2% were deficient. Men who reported at least one outdoor yard activity had a mean 25 (OH) D of 25.6 ng/ml (p<0.0001). Here, 22.6% were deficient.¹¹

In present study, some patients had more than one complaint. (53%) patients came with backache, (22%) patients had whole body ache, (44%) had pain in muscles, (25%) had alopecia, (21%) had repeated fall or fractures while (3%) patients had muscular chest pain.

Parents who brought their children complained that their child is not sitting properly 18 (18%) (Table 4).

No comparable study was found for this. In present study, (47%) patients had normal levels of vitamin D, (31%) had insufficient levels of vitamin D while (22%) patients had deficient levels of vitamin D (Table 5).

Contrary to our study, Hashemipour et al found the prevalence of severe deficiency as 9.5 %. Moderate vitamin D deficiency was seen in 57.6%. Mild vitamin D deficiency was seen in 14.2%.¹²

Contrary to our study, Sedrani et al found the prevalence of vitamin D deficiency as 70% in males. In spite of greater clothing in females, it was 30% in young females.¹³

CONCLUSION

In present study, we conclude that irrespective of normal body mass index or physical activity, patients presented with various complaints. In them, vitamin D levels were either insufficient or deficient in large number of patients.

Vitamin D levels should be done as screening or at least when patients present with suggestive complaint.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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