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Original Research Article

Prevalence of Vitamin D Deficiency among Geriatric Patients: An Institutional Based Study

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ABSTRACT

Introduction: Vitamin D Deficiency (VDD) is prevalent in India, a finding that is unexpected in a tropical country with abundant sunshine. India is located between 8.4°N and 37.6°N latitude with the majority of its population living in regions experiencing optimum sunlight throughout the year. Despite its sunny environment, hypovitaminosis D is common in India. Objective of the study was to assess the prevalence of vitamin D deficiency among geriatric patients of a tertiary care hospital.

Materials and Methods: This study was an observational and analytical cross sectional study carried out in Department of General Medicine, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur, Uttar Pradesh (India). The study was conducted from July 2016 to June 2017. Blood samples were taken from study participants and sent to laboratory.

Results & Conclusion: Calculated sample size for this cross sectional study was 129 and we have taken 160 sample. Geriatric patients who were not on vitamin D and calcium supplements for last 6 months were included for the study. Out of 160 participants, only 8 (5%) participants had normal vitamin D levels and 152 (95%) study participants had low vitamin D levels among them 107 (66.88%) participants had vitamin D deficiency, 45 (28.13%) participants had vitamin D insufficiency.

Keywords: Geriatric Patients, Vitamin D, Deficiency, Prevalence.

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INTRODUCTION

Vitamin D was classified as a vitamin in the early 20th century and in the second half of the 20th century as a prohormone.[1,2] Vitamin D has been traditionally known as "anti-ricketic factor or sunshine vitamin". It is a unique nutrient because it can be synthesized endogenously (skin) and it functions as a hormone.[3] Vitamin D deficiency is pandemic, yet it is the most under-diagnosed and undertreated nutritional deficiency in the world.[4-6] Vitamin D deficiency is widespread in individuals irrespective of their age, gender, race and geography. It has been estimated that 1 billion people worldwide have Vitamin D deficiency or insufficiency.[7] Vitamin D Deficiency (VDD) is prevalent in India, a finding that is unexpected in a tropical country with abundant sunshine.[8] India is located between 8.4°N and 37.6°N latitude with the majority of its population living in regions experiencing optimum sunlight throughout the year. Despite its sunny environment, hypovitaminosis D is common in India. In a north Indian study prevalence of vitamin D deficiency among healthy Indians above 50 years of age was found to be 91.6 % and insufficiency 6.8%.[9] Against this background present study was carried out to determine the prevalence of vitamin D deficiency in vulnerable age group of geriatric patients.

METHODOLOGY

This study was an observational and analytical cross sectional study carried out in Department of General Medicine, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur, Uttar Pradesh (India).

The study was conducted from July 2016 to June 2017. For this study, blood was drawn from participants after an overnight fast (minimum8 h), centrifuged and transported daily to the central laboratory.

Sample size

Sample size was calculated by using the formula for sample size estimation for cross sectional study. Going through extensive literature reviews, It was found that prevalence of vitamin D deficiency in apparently healthy adult of mean age 57.67 ± 9.46 years in India is 91.2% (10). Sample size was estimated by using the formula:

N= 4PQ/L2

Where Q= (100-P); N=Sample size; P= Prevalence of vitamin D deficiency; L=Margin of error of 5 %

Minimum sample size to be studied came out to be 129 and a total of 160 subjects were taken for study. Patients who were

on vitamin D and calcium supplements for last 6 months were excluded. A semi structured questionnaire was developed by incorporating inputs from other published literature, text books, regarding socio demographic details. Blood samples were taken from study participants after informed consent.

RESULTS

Table 2 shows age wise distribution of geriatric patients. Majority of participants i.e. 102 (63.75 %) belonged to the age group of 60-69 years, while 53 (33.13 %) participants were in the age group of 70-79 years. Only 5 (3.12 %) participants belonged to age group of 80 above years. Table 3 shows distribution of geriatric patients according to serum vitamin D3 levels. Majority of participants i.e. 107 (66.88%) belonged to deficiency, while 45 (28.13 %) participants were suffer from Insufficiency. Only 8 (5%) participants were normal. Fig 1 shows distribution of geriatric patients according to serum vitamin D3 levels. 107 (66.88%) participants had vitamin D3 deficiency, 45 (28.13%) participants had vitamin D3 insufficiency, and 8 (5%) participants had normal vitamin D3 levels.

Table 1: Expected Range values of the ADVIA Centaur Vitamin D Total Assay

Vitamin D Status	Deficiency	
Deficiency	<20	<15
Insufficiency	20 to <30	50 to <75
Sufficiency	30–100	75–250

Table 2: Age wise distribution of geriatric patients

Age group in years	Number of Participants	Percentage N=160
60-69	102	63.75 %
70-79	53	33.13%
Above 80	5	3.2%
TOTAL	160	100%

Table 3: Distribution of geriatric patients according to serum vitamin D3 levels

Age	Deficiency	Insufficiency	Normal
60-69	32	11	3
70-79	35	15	4
Above 80	40	19	1
TOTAL	107	45	8

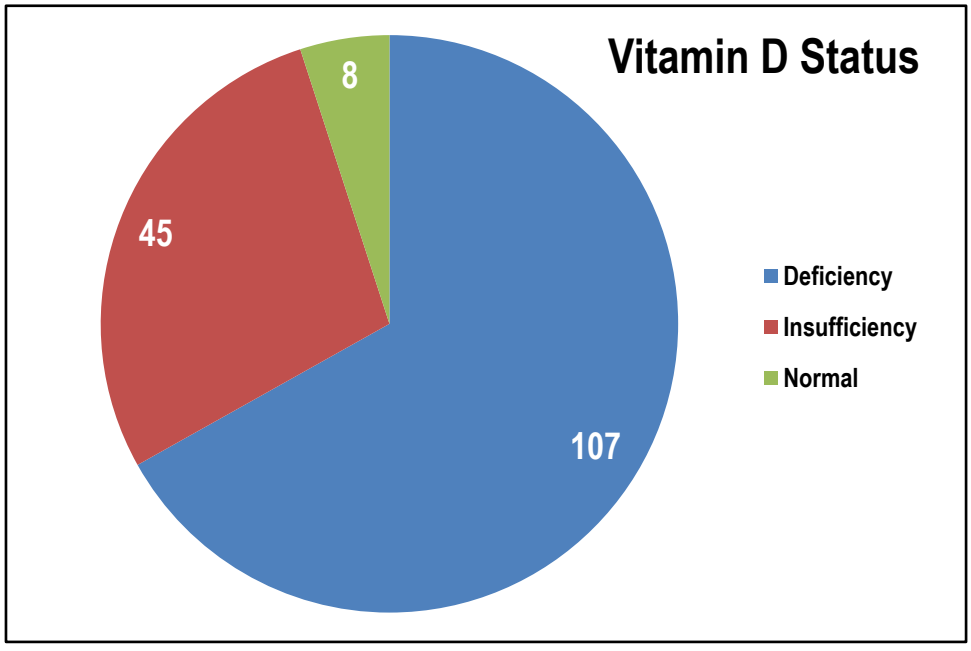

Fig 2: Distribution of geriatric patients according to serum vitamin D3 levels

DISCUSSION

In our study , Majority of participants i.e. 102 (63.75 %) belonged to the age group of 60 – 69 years, while 53 (33.13 %) participants were in the age group of 70 – 79 years. Only 5 (3.12 %) participants belonged to age group of 80 above years and according to serum vitamin D3 levels majority of participants i.e. 107 (66.88%) belonged to deficiency, while 45 (28.13 %) participants were suffer from Insufficiency. Only 8 (5%) participants were normal.

RK Marwaha et al (2011) conducted a cross sectional study in Delhi to know the prevalence of vitamin D deficiency, they selected age group of study participants from 50 to 84 years.[10] Present study age group is similar to this study.

Arti Muley et al (2014) conducted a cross sectional study at Vadodara among 141 adults in the age group 30 to 60 years.[11]

Maria I Lapid et al (2013) conducted a cross sectional study to find association of vitamin D status with depression. There were 1618 patients with age group above 65 years.[12]

A H Zargar et al (2007)[13] conducted a study to assess the vitamin D status among healthy adults of Kashmir, they selected 92 healthy adults in the age group of 18 to 40 years RK Marwaha et al (2011) conducted a cross sectional study in Delhi to know the prevalence of vitamin D deficiency. There were 643 (47.77%) males and 703 (52.22%) females.

A H Zargar et al (2007) conducted a study to assess the vitamin D status among healthy adults of Kashmir. They selected 92 healthy adults including 64 men and 28 women.

Jawed Altaf Baig et al (2013)[14] conducted a study to assess vitamin D deficiency, they have observed out of 176 participants there were 89 (50.57%) males and 87 (49.43%) females. Present study finding are consistent with above mentioned study.

Dr Elham Sharif Et al (2010) conducted a cross sectional study at Quatar to assess the vitamin D status, (53.5%) participants were having severe vitamin D deficiency, (44.5%) participants were having Vitamin D insufficiency and 3% participants were having normal vitamin D levels.[15] Shajee Ahmed Siddique et al (2011) conducted a study among 243 patients of lower backache of age ranged from 13-74 years. Out of these 81 % had suboptimal vitamin D levels which comprised of 83.3% females and 16.7% males.[16] RK Marwaha et al[10] (2011) conducted a cross sectional study among 1346 subjects. They found that that vitamin D deficiency [VDD, serum 25(OH) D levels < 20 ng/ml) was present in 91.2% and Vitamin D insufficiency [VDI, serum 25(OH)D levels 20-<30 ng/ml] in 6.8% of study participants.

CONCLUSION

This study conducted among geriatric patients highlighted important facts about vitamin D status of a vulnerable geriatric age group. Present study confirmed that Vitamin D deficiency is a major public health problem among geriatric age group. Thus according to data analyzed in this study and available in the literature indicate need for public health planner to think of preventive strategies like food fortification with vitamin D and availability of vitamin D supplements at primary health and promote research to find out different factors associated with vitamin D deficiency.

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