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FREQUENCY OF VITAMIN D DEFICIENCY AMONG PATIENTS ATTENDING IN OUT-PATIENT DEPARTMENT IN A TERTIARY CARE HOSPITAL IN LAHORE

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ABSTRACT

Objective: To determine the prevalence of Vitamin D deficiency among individuals attending in Fatima Memorial Hospital Lahore.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at Medicine outpatient department of Fatima Memorial Hospital Lahore, from May 2017 to Aug 2017.

Material and Methods: A total of 460 individual participated in the study. All patients who attended the Medical Outpatient Department (OPD), above 20 years of age, well oriented and voluntarily agreeing to participate in the study were included. Patients who had any risk factor which could alter vitamin D levels were excluded from the study. Informed consent was taken before enrollment. All data were analyzed by using SPSS version 23.0

Results: A total of 460 people were included in the study out of which 101 (21.9%) were males and 359 (78.04%) were females. The mean age was 42.7 years with a range of 20 to 80 years of age. Median (range) of vitamin D in males was 23 (7.0-99) ng/ml while in females was 16 (1.3-107) ng/ml. Prevalence of vitamin D deficiency according to its severity was: mild deficiency: 22.6%, moderate deficiency: 24.8% and severe deficiency: 25.3%.

Conclusion: Vitamin D deficiency is more prevalent among young age group and in women among all groups. Vitamin D deficiency is a common problem in our society. Proper and timely diagnosis and treatment can help in prevention of several diseases and can lead to better bone health.

Keywords: Bone health, Vitamin D, Vitamin D Deficiency, 25-hydroxy vitamin D.

INTRODUCTION

The vitamin D deficiency is one of the most common nutritional deficiencies in developing as well as in developed countries and it is considered as one of the emerging medical challenges[1]. There are two main sources of vitamin D in our body: internal production on exposure to sunlight and consumption of vitamin D containing foods like milk. Maintenance of calcium and phosphorus levels within normal range in our body is the main function of vitamin D. It enhances calcium and phosphorus absorption from intestine and kidneys and stores them into bones.

Decreased bone density and mineralization in children and adults leading to rickets and osteomalacia respectively are two well-known complications of vitamin D deficiency[1,2]. If we review the literature, it is evident that vitamin D deficiency can lead to cardiovascular diseases, common cancers, nonspecific musculoskeletal pains and autoimmune diseases most importantly Diabetes Mellitus (DM)[3-10]. Incidence of diagnosed congenital rickets has increased during last few years and this only simulates the tip of ice berg, actual condition is worse than these known cases[1-4,11].

One of the main sources of vitamin D production in our body is sun light exposure, which is the common reason behind the fact that around 40-50% population of Europe and America are suffering from vitamin D deficiency[5]. But recent studies have also demonstrated that the prevalence is high even in the sunniest countries like the Kingdom of Saudi Arabia (KSA), United Arab Emirates (UAE), India and Pakistan. Results of previous studies in the subcontinent have also demonstrated that

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vitamin D deficiency is currently rising issue in these areas[3].

Due to illiteracy and poor quality of food, people in Pakistan are suffering from poor nutrition, one of the main reasons of vitamin D deficiency in our country[6]. We conducted this study to find out the deficiency of vitamin D among men and women in urban conditions. This study was done in a tertiary care hospital of a central city of Punjab: Lahore.

MATERIAL AND METHODS

We conducted this cross sectional study to determine the prevalence of vitamin D deficiency among patients visiting outpatient department (OPD) of Medicine from May, 2017 till August, 2017 in Fatima Memorial Hospital, Lahore. Non-probability convenience sampling was done and 460 patients were selected using 99% confidence interval and 5% margin of error, Survey Monkey Calculator was used.

All patients who attended the Medical Outpatient Department (OPD), above 20 years of age, well oriented and voluntarily agreeing to participate in the study were included. Patients having any other risk factors like metastatic cancers, prolonged immobilization due to any reasons, parathyroid diseases, type 1 DM, bone disease or any other condition which can alter blood levels of vitamin D were excluded.

In all patients 25-hydroxy vitamin D levels were measured. Levels between 30-90 ng/dl were considered as normal. Vitamin D deficiency was defined as mild: 20-30 ng/ml, moderate: 10-20 ng/ml and severe <10 ng/ml.

Data was presented as mean and standard deviation for the variables with normal distribution, while for those variables which did not have a normal Gaussian distribution median values were used. To reduce the skewness, we used log transformation.

Statistical Package of Social Science (SPSS Inc., Chicago, IL) for Windows version 23.0 was used for data analysis.

All the study objects were informed about the details and purpose of the study in a comprehensible way and only those who gave voluntary informed and written consent were selected to participate in the study.

RESULTS

A total of 460 people participated in the study out of which 101 (21.9%) were men and 359 (78.04%) were women. The mean age of participants was 42.7 years while the age range was from 20 to 80 years of age. The median of age participants was 41 years. Vitamin D levels showed skewed distribution both in males and females. The median and range of vitamin D level in males was 23 ng/ml and 7.0-99 ng/ml respectively, while for females' median of vitamin D level was 16 ng/ml with a range of 1.3-107 ng/ml. In our study population, 126 patients

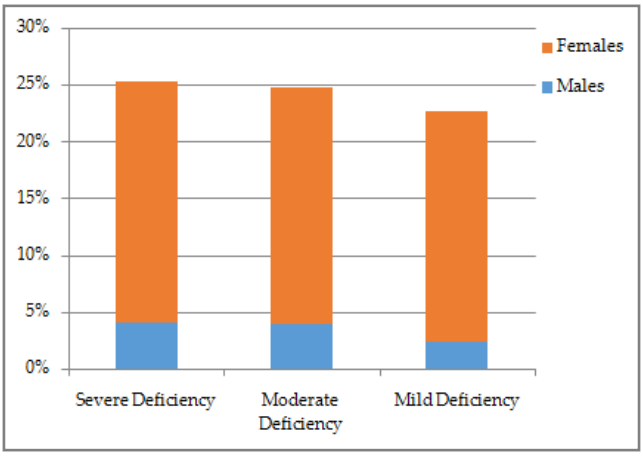

Figure: Distribution of deficiency of Vitamin D Level.

Table: Distribution of mean (standard deviation) of Vitamin D among individuals of different age groups according to gender in study population.

Vitamin D (ng/ml)	20-39 years	40-59 years	60-80 years
Overall(ng/ml)	13 (5-105)	27 (8-120)	21 (6-165)
Males	15 (8-105)	32 (12-120)	8 (3-160)
Females	11 (5-80)	22 (4-120)	13 (9-170)

(27.4%) had normal vitamin D levels while the prevalence of mild deficiency of vitamin D level (20-30ng/ml) was 104 (22.6%), of moderate deficiency (10-20ng/ml) was 114 (24.8%) and severe deficiency was seen in 116 (25.3%).

Distribution of deficiency of Vitamin D Level is given in the figure.

The population was further divided into three groups on the basis of their age: 20-39, 40-59 and 60-80. The prevalence of vitamin D deficiency was compared among these groups. Younger age group showed a higher prevalence of vitamin D deficiency. Among all of these age groups the prevalence of vitamin D deficiency was higher in females than in males.

DISCUSSION

Calcium deficiency is a nowadays well-documented reality in our country which by itself hints towards co-existing low levels of vitamin D in our population[8,12]. The results of our study showed that the prevalence of vitamin D deficiency is very high in patients attending the OPD of a tertiary care hospital in the city of Lahore which is a thickly populated and one of the well-developed cities of Pakistan. Study demonstrated that almost 70% of the study population have vitamin D deficiency out of which 25.3% are severely depleted with a value of less than 10 ng/ml of vitamin D. The results are contrary to the fact in common population that high sun exposure in countries like Pakistan covers for all need of vitamin D. Similar results have been shown in previous studies conducted in Kingdom of Saudi Arab, Iran and other Middle East countries with high sun exposure[1,3,13,14]. A number of different factors can be blamed for this surprising reality. The quality of milk and its products are really poor, which lead to decreased intake of vitamin D in our body. Cultural and religious restrictions also contribute to the fact that it is highly prevalent in young women[15]. Environmental factors also play a role as most of the people who work in hot weather try to cover their normally sun exposed areas with clothes to avoid sun burn and heat strokes. All these factors collectively are resulting in an ever increasing problem of vitamin D deficiency in Pakistan. Several previous studies conducted in Pakistan have also demonstrated similar results.

Our study results showed that prevalence is high among the younger population as compared to older population which is not comparable with previous researches done in other parts of the world where prevalence is high in older age groups[8,16]. This can be due to over protection of sun exposed body parts and due to poor quality of food and less fortification of food with vitamin D and calcium.

CONCLUSION

Vitamin D deficiency is more prevalent among young age group and in women among all groups. Vitamin D deficiency is a common problem in our society. Proper and timely diagnosis and treatment can help in prevention of several diseases and can lead to better bone health.

LIMITATIONS OF STUDY

There were several limitations to our study as we did not take into account some variables which can alter the level of vitamin D as race, melanin production in body, work environment, exposure to sun light and dietary habits. We recommend that further larger studies are required to look into above mentioned factors.

RECOMMENDATION

Interventions at primary level of health care like education of population through electronic and print media, alleviation of poverty, fortification of food with vitamin D, calcium and phosphorus and emphasis on regular tests of vitamin D and calcium level in body especially in women and younger adults can help to reduce vitamin D deficiency and it can make them more productive and beneficial for the society, minimizing the chances of its complications. Government should implement cost effective programs in peripheral areas with difficult access to secondary level of institutions for this purpose

and also provide facilities at primary health care for testing vitamin D levels free of cost.

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Discolure

The study has no conflict of interest to declare by any author.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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