

ASSESSMENT OF THE VITAMIN D LEVELS IN PATIENTS OF ASTHMA AT TERTIARY CARE CENTRE

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ABSTRACT

Background: Vitamin D inadequacy has been connected to build frequency of respiratory sicknesses like asthma with its supplementation appeared to mitigate these impacts. Results acquired from considers utilizing experimental models and human cells with respect to the restorative impact of nutrient D supplementation has clashed those gotten from some clinical preliminaries. **Material & Methods:** The present prospective study was conducted at department of respiratory medicine of our tertiary care hospital. We enrolled 50 study participants from outdoor and from ward by simple random sampling, who were presented with signs and symptoms of bronchial asthma for more than 6 months. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. **Results:** In the present study, the 25(OH) Vitamin D levels of total study participants was recorded. On the basis of the 25(OH) Vitamin D levels all study participants were divided in three groups respectively, Deficient levels, Insufficient levels and Sufficient levels. Out of the total, 29 (58%) study participants had deficient 25(OH) Vitamin D levels and 21 (42%) study participants had insufficient 25(OH) Vitamin D levels. None of the study participants had sufficient 25(OH) Vitamin D levels. **Conclusion:** We concluded from the present study that there was deficiency of 25(OH) Vitamin D levels was found among study participants but this was statistically non-significant. A non-relationship of low serum 25 (OH) D levels with airway route impediment also seen.

Keywords: Asthma, Vitamin D levels, airway route impediment.

INTRODUCTION

Acute severe asthma is reported as one of the most common emergency condition which results in hospitalization (1). Asthma is reported in previous studies as most distributed diseases around the world with an approximate burden of 300 million patients(2). The prevalence of asthma is varying from different geographical distribution, some studies conducted on its prevalence and they found prevalence of asthma ranging from 1% to 18% among population of various countries (3). In previous studies, it was reported that severity grade of asthma was divided among mild, moderate and severe. The etiopathogenesis of asthma is reported as a chronic inflammatory disease which involve the lower respiratory tracts of the lungs. Along with

inflammation there is episodic airflow obstruction also persists and it accounts for morbidity (4).

In a study it was reported that acute attack of asthma accounts for high rates of hospital emergency admissions and hospitalizations in ICU per year (5). According to various reports acute attack of asthma is very common medical emergency which is result in high morbidity and mortality (6). In Indian scenario a previous study reported that acute attack of asthma had increase in incidence compared to previous decades (7). Previous studies reported that vitamin D, through the enactment of the vit. D receptor (VDR), has been appeared to have an immunomodulatory impact on a large group of

immune cells, including B and T lymphocytes, dendritic cells (DCs) and macrophages, just as auxiliary cells in the airways (8). Vitamin D inadequacy has been connected to build frequency of respiratory sicknesses like asthma with its supplementation appeared to mitigate these impacts. Results acquired from considers utilizing experimental models and human cells with respect to the restorative impact of nutrient D supplementation has clashed those gotten from some clinical preliminaries (9). Hence, present study was conducted to assess and evaluate the vitamin D levels in patients of moderate persistent asthma at our tertiary care centre.

MATERIALS & METHODS

The present prospective study was conducted at department of respiratory medicine of our tertiary care hospital. The study duration was of six months. A sample size of 50 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. Patients were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant.

The data were collected by detailed history of acute exacerbation of asthma, treatment history, general physical and clinical examination from each patient after taking the written consent. All the enrolled study participants were subjected to routine lab investigations including CBC, eosinophil count, chest X ray, arterial blood gas analysis and electrolytes. All study participants were subjected to 25(OH) Vitamin D level evaluation. All data were recorded in Microsoft excel spreadsheet. Spirometer was utilized to survey FEV1 in the first second. History of exacerbation asthma among study participants in past 3months also recorded. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In present study, we enrolled 50 study participants from outdoor and from ward by simple random sampling, who were presented with signs and symptoms of bronchial asthma for more than 6 months. The age of study participants was ranged from 18 years to 64 years. Majority of the study participants 21 (42%) were belonging the more than

50 years age group which was followed by 24% study participants in more than 60 years age group which was followed by 16 (32%) study participants in the age group of 30-50 years followed by 13 (26%) study participants in the age group of 18-30 years. The mean age of study participants was 43.2 years. Out of total study participants it was reported that females were likely affected 34 (68%) more than males 16 (32%) in the ratio of 2.12: 1. (Table1)

Table 1: Distribution of study subjects according to the age.

Study parameters	Number of subjects (%)	
Age group	18-30 years	13 (26%)
	30-50 years	16 (32%)
	>50 years	21 (42%)
Gender	Female	34 (68%)
	Male	16 (32%)

In the present study, the 25(OH) Vitamin D levels of total study participants was recorded. On the basis of the 25(OH) Vitamin D levels all study participants were divided in three groups respectively, Deficient levels, Insufficient levels and Sufficient levels. Out of the total, 29 (58%) study participants had deficient 25(OH) Vitamin D levels and 21 (42%) study participants had insufficient 25(OH) Vitamin D levels. None of the study participants had sufficient 25(OH) Vitamin D levels. (Table 2)

Table 2: Distribution of study subjects according to the 25 (OH) Vitamin D levels.

25(OH) Vitamin D levels	Number of subjects (%)
20 ng/ml (Deficient)	29 (58%)
20-29 ng/ml (Insufficient)	21 (42%)
> 30 ng/ml (Sufficient)	0 %

Table 3: Comparison of history exacerbation of asthma among study participants in past 3months and mean levels of 25(OH) Vitamin D.

History exacerbation of asthma (past 3months)	25(OH) Vitamin D levels (mean±SD)	P value
No exacerbation (n=08)	23.1 ± 1.8 ng/ml	>0.05
One exacerbation (n=31)	20.6 ± 3.5 ng/ml	
More than one exacerbation (n=11)	19.3 ± 2.4 ng/ml	

In the present study, the history exacerbation of asthma (past 3 months) of total study participants was recorded. On the basis of the history exacerbation of asthma (past 3 months) all study participants were divided in three groups respectively, no exacerbation, one exacerbation and more than one exacerbation. Out of the total 16% study participants had no exacerbation in past 3 months, 62% study participants had one exacerbation in past 3 month and 22% study participants had more than one exacerbation in past 3 months. On the assessments of mean 25(OH) Vitamin D levels among these groups, among no exacerbation group mean value of 25(OH) Vitamin D levels was 23.1 ± 1.8 ng/ml, among one exacerbation group mean value of 25(OH) Vitamin D levels was 20.6 ± 3.5 ng/ml and among more than one exacerbation group mean value of 25(OH) Vitamin D levels was 19.3 ± 2.4 ng/ml. however, this difference was statistically non-significant (P value > 0.05). (Table 3)

DISCUSSION

In present study, we enrolled 50 study participants from outdoor and from ward by simple random sampling, who were presented with signs and symptoms of bronchial asthma for more than 6 months. The age of study participants was ranged from 18 years to 64 years. Majority of the study participants 21 (42%) were belonging the more than 50 years age group which was followed by 24% study participants in more than 60 years age group which was followed by 16 (32%) study participants in the age group of 30-50 years followed by 13 (26%) study participants in the age group of 18-30 years. The mean age of study participants was 43.2 years. Out of total study participants it was reported that females were likely affected 34 (68%) more than males 16 (32%) in the ratio of 2.12: 1. Similar results were obtained in a study conducted by Sood V et al among 65 patients suffering from moderate persistent bronchial asthma at hilly areas. They included age group of mean age 41.2 years with higher female to male ratio in their study and found similar results to present study (10).

In the present study, the 25(OH) Vitamin D levels of total study participants was recorded. On the basis of the 25(OH) Vitamin D levels all study participants were divided in three groups respectively, Deficient levels, Insufficient levels and Sufficient levels. Out of the total, 29 (58%) study participants had deficient 25(OH) Vitamin D levels and 21 (42%) study participants had insufficient 25(OH) Vitamin

D levels. None of the study participants had sufficient 25(OH) Vitamin D levels. Similar results were obtained in a study conducted by S Korn et al among patients suffering from bronchial asthma, they found 25(OH)D fixations in grown-up asthmatics were low (25.6 ± 11.8 ng/ml) and nutrient D inadequacy or insufficiency (nutrient D <30 ng/ml) was normal (67%). 25(OH)D levels were identified with asthma seriousness (discontinuous: 31.1 ± 13.0 ng/ml, mellow: 27.3 ± 11.9 ng/ml, moderate: 26.5 ± 12.0 ng/ml, extreme: 24.0 ± 11.8 ng/ml, $p = 0.046$) and control (controlled: 29.5 ± 12.5 ng/ml, somewhat controlled 25.9 ± 10.8 ng/ml, uncontrolled: 24.2 ± 11.8 ng/ml, $p = 0.030$). The recurrence of nutrient D inadequacy or insufficiency was altogether higher in patients with serious or uncontrolled asthma and was related with a lower FEV1 (nutrient D <30 versus ≥ 30 ng/ml 2.3 ± 0.9 L versus 2.7 ± 1.0 L, $p = 0.006$), more elevated levels of breathed out NO (45 ± 46 ppb versus 31 ± 37 ppb, $p = 0.023$), a higher BMI (28.3 ± 6.2 versus 25.1 ± 3.9 , $p < 0.001$), and sputum eosinophilia ($5.1 \pm 11.8\%$ versus $0.5 \pm 1.0\%$, $p = 0.005$). The utilization of oral corticosteroids or sputum eosinophilia was related with a 20% or 40% higher danger of nutrient D inadequacy or lack (11).

In the present study, the history exacerbation of asthma (past 3 months) of total study participants was recorded. On the basis of the history exacerbation of asthma (past 3 months) all study participants were divided in three groups respectively, no exacerbation, one exacerbation and more than one exacerbation. Out of the total 16% study participants had no exacerbation in past 3 months, 62% study participants had one exacerbation in past 3 month and 22% study participants had more than one exacerbation in past 3 months. On the assessments of mean 25(OH) Vitamin D levels among these groups, among no exacerbation group mean value of 25(OH) Vitamin D levels was 23.1 ± 1.8 ng/ml, among one exacerbation group mean value of 25(OH) Vitamin D levels was 20.6 ± 3.5 ng/ml and among more than one exacerbation group mean value of 25(OH) Vitamin D levels was 19.3 ± 2.4 ng/ml. however, this difference was statistically non-significant (P value > 0.05). Similar results were obtained in a study conducted by C Ronit et al among patients suffering from bronchial asthma, they found Roughly 308 000 individuals with at any rate one nutrient D estimation were remembered for the associate. Among them, 6.9% (21 237) had doctor analyzed asthma versus 5.7% in everybody. Serum

25-OHD levels across the two gatherings were comparable. In any case, among those with nutrient D insufficiency, the chances of having a worsening were 25% more noteworthy contrasted with those with levels in the ordinary range. This affiliation stayed huge subsequent to controlling for known confounders. While there was no huge relationship between nutrient D status and doctor analyzed asthma, there was a solid relationship with asthma intensifications. The introduced proof backings nutrient D screening in the subgroup of asthmatics that are uncontrolled and experience intermittent intensifications (12).

CONCLUSION

We concluded from the present study that there was deficiency of 25(OH) Vitamin D levels was found among study participants but this was statistically non-significant. A non-relationship of low serum 25 (OH) D levels with airway route impediment also seen. In any case, extensive variety in various investigation results as to occasional, lung work and exacerbational variety underline the requirement for a meta-examination in this field.

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