

Clinical Study on Vitamin D Levels in Childhood Asthma

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Abstract

Background: Asthma is a leading cause of morbidity in children worldwide. There is a high prevalence of asthma in the Indian subcontinent. Vitamin D deficiency has been linked with asthma and upper respiratory tract infections in children. **Aims and Objectives:** The aim of this research was to study the relation between vitamin d deficiency and level of asthma severity. **Methods:** The present study included 50 asthmatic children presenting to the paediatric OPD. All the subjects underwent detailed history taking and thorough clinical examination. All the necessary clinical data was collected through a questionnaire. Serum Vitamin D analysis was done using an automated device according to the standard guidelines. Data was collected in MS Excel and presented as numbers and percentages in the form of tables and figures. **Results:** There was an equal gender distribution in our study. 26% of the subjects had mild persistent asthma, 28% had moderate persistent asthma, 14% had severe persistent asthma and 32% had intermittent asthma. 36% of the study population was assessed with Vitamin D deficiency. In 42% of asthmatic children, level of control was good. In 26% of subjects asthma was partially controlled and uncontrolled in 32% of patients. The group of uncontrolled asthma had the highest i.e. 58% Vitamin D deficient children. **Conclusion:** There was prevalence of Vitamin D deficiency in asthmatic children. There was direct and significant relation between Vitamin D deficiency and severity of asthma.

Keywords: Asthma, Childhood Asthma, Vitamin D, Vitamin Deficiency.

INTRODUCTION

Asthma is regarded as one of the most prevalent respiratory illness worldwide according to the World Health Organization.^[1] There is also high prevalence of pediatric asthma in the Indian subcontinent.^[2]

Asthma is a chronic inflammatory condition of the airway causing severe morbidity and mortality. The pathophysiology of bronchial asthma involves a hyper-responsive airway which triggers to cause inflammation leading to bronchoconstriction and mucus plug formation. The clinical features of asthma include wheezing, coughing, breathlessness, chest tightness, chest pain. Genetic factors, dietary factors, certain allergens, pollution and Vitamin D deficiency have been implicated in aetiology of bronchial asthma.^[3] Vitamin D deficiency has also been implicated in frequent upper respiratory tract infections in children.^[4]

We have undertaken this study to assess the Vitamin D levels in asthmatic children and relation between Vitamin D levels and levels of severity of asthma.

MATERIAL AND METHODS

Study Design: The present study was a Hospital Based Observational Study.

Study Setting: The present research was carried out at the Department of Paediatrics, Bhaskar Medical College and General Hospital, Ranga Reddy, Telanagana.

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Sample Size: A total of 50 asthmatic children presenting to the paediatric OPD, who met the inclusion criteria and whose guardians consented were included in the study.

Inclusion Criteria

1. Children Diagnosed with Asthma.
2. Children aged 5-15 Years.
3. Children with no prior history of Vitamin D deficiency.
4. Children with no other chronic systemic illnesses.

Exclusion Criteria

1. Children whose guardians did not consent.
2. Children with history of Vitamin D deficiency.
3. Children with chronic systemic illnesses.

Methodology

All the subjects underwent detailed history taking and thorough clinical examination. All the necessary clinical data was collected through a questionnaire. Serum Vitamin D analysis was done using an automated device according to the standard guidelines

Statistical Analysis

Data was collected in MS Excel and presented as numbers and percentages in the form of tables and figures.

RESULTS

Table 1: ender

Gender	No. of Patients
Male	26(52%)
Female	24(48%)

There was an even gender distribution in our study, with males accounting for 52% and females for 48% of the total study population.

Table 2: Asthma Severity

Severity	No. of Patients
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Mild Persistent	13(26%)
Moderate Persistent	14(28%)
Severe Persistent	7(14%)
Intermittent	16(32%)

As depicted in the above table, 26% of the subjects had mild persistent asthma, 28% had moderate persistent asthma, 14% had severe persistent asthma and 32% had intermittent asthma.

Table 3: Vitamin D Levels

Vitamin D Status	No. of Patients
Deficient	18(36%)
Sufficient/Insufficient	32(64%)

36% of the study population was assessed with Vitamin D deficiency. The rest 64% were either sufficient or insufficient.

Table 4: Vitamin D Levels

Level of Control	No. of Patients
Well Controlled	21(42%)
Partially controlled	13(26%)
Uncontrolled	16(32%)

In 42% of asthmatic children, level of control was good. In 26% of subjects asthma was partially controlled and uncontrolled in 32% of patients.

Table 5: Vitamin D Levels Vs. Level of Asthma Control

Level of Control	No. of Patients with Vitamin D deficiency
Well Controlled	6%
Partially controlled	22%
Uncontrolled	58%

As depicted in the above table, group of uncontrolled asthma had 58% Vitamin D deficient children.

DISCUSSION

Asthma is a leading cause of morbidity and mortality in children in India and worldwide. Vitamin D has been implicated in upper respiratory tract infections and asthma in children. We conducted this observational study aiming to study the relation between vitamin d levels and severity of asthma. There was an equal gender distribution in our study. 26% of the subjects had mild persistent asthma, 28% had moderate persistent asthma, 14% had severe persistent asthma and 32% had intermittent asthma. 36% of the study population was assessed with Vitamin D deficiency. In 42% of asthmatic children, level of control was good. In 26% of subjects asthma was partially controlled and uncontrolled in 32% of patients. The group of uncontrolled asthma had the highest i.e. 58% Vitamin D deficient children. The groups partially controlled asthma and well controlled asthma had fewer vitamin d deficient children. Similar results were obtained in studies done by Karnam et al.^[5], Sachdeva et al.^[6] and Anand et al.^[7] Vitamin D deficiency is prevalent among asthmatic children and Vitamin D supplementation is implicated in asthmatic children. Further research is

required in this area to illustrate other determining factors and exact mechanism of vitamin relation.

CONCLUSION

There was prevalence of Vitamin D deficiency in asthmatic children. There was direct and significant relation between Vitamin D deficiency and severity of asthma.

Conflict of Interest: No conflict of interest

Ethical Clearance: Ethical clearance was obtained from the IEC prior to commencement of the study.

Source of Funding: Self.

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