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A Study on Clinical Profile and Severity of Bronchial Asthma in children attending a Tertiary Care Hospital

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ABSTRACT

Background: Bronchial asthma is one of the most common chronic respiratory disorders affecting children and contributes significantly to pediatric morbidity worldwide. Understanding the clinical profile and severity pattern of asthma is important for early diagnosis and effective management.
Aim: To study the clinical profile and severity pattern of bronchial asthma in children attending a tertiary care hospital.
Materials and Methods: This hospital-based observational study was conducted in the Department of Pediatrics over a period of six months. A total of 100 children aged 5–15 years diagnosed with bronchial asthma were included in the study. Detailed demographic data, clinical presentation, triggering factors, family history, associated allergic conditions, and severity pattern were recorded using a structured proforma. Asthma severity was classified according to Global Initiative for Asthma (GINA) guidelines. Data were analyzed using descriptive statistics and Chi-square test.
Results: The majority of children belonged to the age group of 5–10 years (62%) with male predominance (63%). Cough (92%), wheezing (88%), and breathlessness (81%) were the most common presenting symptoms. Dust exposure (58%) and respiratory infections (52%) were the major triggering factors. Family history of asthma was present in 46% of children. Mild persistent asthma was the most common severity pattern observed in 41% of cases, followed by intermittent asthma (32%). A statistically significant association was observed between family history and severity of asthma ($p = 0.042$).
Conclusion: Bronchial asthma was more common among younger children and males. Environmental triggers and family history played an important role in disease occurrence and severity. Early diagnosis, avoidance of triggering factors, and appropriate management are essential for effective disease control and reduction of asthma-related morbidity.

Keywords*: Bronchial asthma, children, wheezing, severity pattern, pediatric asthma, clinical profile.*

INTRODUCTION

Bronchial asthma is one of the most common chronic respiratory disorders affecting children worldwide and is characterized by chronic airway inflammation, reversible airway obstruction, and bronchial hyperresponsiveness. The disease commonly presents with recurrent episodes of wheezing, cough, chest tightness, and breathlessness that vary in severity over time. Asthma significantly affects the quality of life of children and contributes to school absenteeism, repeated hospital visits, and increased healthcare burden.[1]

The prevalence of childhood asthma has increased over recent decades, especially in urban populations and developing countries. Environmental pollution, exposure to allergens, passive smoking, rapid urbanization, and changing lifestyle patterns are considered major contributing factors.[2] According to the Global Initiative for Asthma (GINA), asthma is one

of the leading chronic illnesses among children worldwide.[1] In India, several studies have reported a rising prevalence of pediatric asthma among school-aged children.[3]

Bronchial asthma is a multifactorial disease resulting from the interaction between genetic and environmental factors. A positive family history of asthma, allergic rhinitis, eczema, and atopy increases the risk of developing asthma in children.[4] Common triggering factors include dust exposure, smoke, respiratory infections, seasonal variations, exercise, and air pollution.[5] Viral respiratory tract infections are particularly important in precipitating asthma attacks among younger children.[6]

The clinical presentation of asthma varies depending on age and severity of airway inflammation. Recurrent cough, wheezing, breathlessness, nocturnal symptoms, and exercise intolerance are commonly observed.[7] Some children experience mild intermittent symptoms, whereas others may develop persistent severe disease requiring repeated hospitalization. Uncontrolled asthma can negatively affect growth, academic performance, and psychosocial well-being. Assessment of asthma severity is essential for proper management and prevention of complications. The Global Initiative for Asthma (GINA) classifies asthma severity into intermittent, mild persistent, moderate persistent, and severe persistent categories based on symptom frequency and functional limitation.[1] Early identification of severity patterns helps in planning appropriate therapy and improving disease control.

Associated allergic conditions such as allergic rhinitis and eczema are frequently seen in asthmatic children and may worsen disease severity.[4] Early diagnosis, avoidance of triggering factors, patient education, and regular follow-up are important in reducing morbidity and improving quality of life.[8]

Understanding the clinical profile and severity pattern of bronchial asthma among children attending tertiary care hospitals can help in better management and preventive strategies. Hence, the present study was undertaken to evaluate the clinical profile and severity pattern of bronchial asthma in children attending a tertiary care hospital.

MATERIALS AND METHODS:

Study Design

The present study was a hospital-based observational cross-sectional study conducted to evaluate the clinical profile and severity pattern of bronchial asthma in children attending the pediatric department of a tertiary care teaching hospital after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from parents or guardians of all participating children before inclusion in the study.

Study Setting

The study was carried out in the Department of Pediatrics, including both Pediatric Outpatient Department (OPD) and inpatient wards of a tertiary care hospital.

Study Duration

The study was conducted over a period of six months from _____ to _____.

Study Population

Children diagnosed with bronchial asthma who attended the pediatric outpatient and inpatient services during the study period were included in the study.

Sample Size

A total of 100 children fulfilling the inclusion criteria were enrolled in the study.

Sampling Method

Consecutive sampling technique was used. All eligible children presenting during the study period were included until the required sample size was achieved.

Inclusion Criteria

- Children aged between 5 and 15 years.
- Diagnosed cases of bronchial asthma based on clinical history and examination.
- Children presenting with recurrent episodes of wheezing, cough, breathlessness, or chest tightness suggestive of asthma.
- Parents or guardians willing to provide informed consent.

Exclusion Criteria

- Children below 5 years and above 15 years of age.
- Children with congenital heart disease.

- Chronic respiratory illnesses other than asthma such as bronchiectasis or cystic fibrosis.
- Acute respiratory infections without evidence of asthma.
- Children with severe systemic illnesses affecting respiratory function.

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Data Collection Procedure

Detailed demographic and clinical information including age, gender, presenting symptoms, duration of illness, triggering factors, family history of asthma, and associated allergic conditions were recorded using a structured proforma.

Clinical symptoms such as cough, wheezing, breathlessness, chest tightness, nocturnal symptoms, and exercise intolerance were noted. Triggering factors including dust exposure, smoke exposure, respiratory infections, seasonal variation, and exercise were assessed.

Clinical Examination

All children underwent detailed general and systemic examination with special emphasis on respiratory findings. Asthma severity was classified according to Global Initiative for Asthma (GINA) guidelines into:

- Intermittent asthma
- Mild persistent asthma
- Moderate persistent asthma
- Severe persistent asthma

Severity assessment was based on symptom frequency, nighttime symptoms, activity limitation, and requirement of rescue medications.

Investigations

Relevant investigations were performed whenever required, including:

- Complete blood count
- Absolute eosinophil count
- Chest X-ray
- Peak expiratory flow rate (in cooperative children)
- Pulse oximetry

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS software version 22.0. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used. Chi-square test was applied for comparison of categorical variables. A p-value of <0.05 was considered statistically significant.

RESULTS:

A total of 100 children diagnosed with bronchial asthma were included in the present study conducted over a period of six months. The majority of children belonged to the age group of 5–10 years (62%), indicating higher prevalence of bronchial asthma among younger school-aged children. (Table 1)

Table 1: Age Distribution of Study Participants

Age Group (Years)	Number (n=100)	Percentage
5–10 years	62	62%
11–15 years	38	38%

Male predominance was observed in the present study with males constituting 63% of cases. The male-to-female ratio was 1.7:1. (Table 2)

Table 2: Gender Distribution

Gender	Number	Percentage
Male	63	63%
Female	37	37%

Cough was the most common presenting symptom observed in 92% of children, followed by wheezing (88%) and breathlessness (81%). Nocturnal symptoms were present in more than half of the study participants. (Table 3)

Table 3: Presenting Symptoms

Symptom	Number	Percentage
Cough	92	92%
Wheezing	88	88%
Breathlessness	81	81%

Nocturnal Symptoms	56	56%
Chest Tightness	43	43%
Exercise Intolerance	31	31%

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Dust exposure was the most common triggering factor identified in 58% of cases, followed by respiratory infections (52%) and seasonal variation (49%). (Table 4)

Table 4: Triggering Factors Associated with Asthma Exacerbation

Triggering Factor	Number	Percentage
Dust Exposure	58	58%
Respiratory Infections	52	52%
Seasonal Variation	49	49%
Smoke Exposure	35	35%
Exercise	29	29%
Exposure to Pets	11	11%

Family history of asthma was present in 46% of children. Allergic rhinitis was the most common associated allergic condition observed in the study population.

Table 5: Family History and Associated Allergic Conditions

Variable	Number	Percentage
Family History of Asthma	46	46%
Allergic Rhinitis	39	39%
Eczema	18	18%
Atopic Dermatitis	9	9%

Mild persistent asthma was the most common severity pattern observed in 41% of children, followed by intermittent asthma in 32%. Severe persistent asthma was observed in only 6% of cases. (Table 6)

Table 6: Severity Pattern of Bronchial Asthma

Severity Pattern	Number	Percentage
Intermittent Asthma	32	32%
Mild Persistent Asthma	41	41%
Moderate Persistent Asthma	21	21%
Severe Persistent Asthma	6	6%

All severity categories showed male predominance. Mild persistent asthma was the predominant severity pattern among both male and female children. (Table 7)

Table 7: Distribution of Severity According to Gender

Severity Pattern	Male	Female	Total
Intermittent Asthma	21	11	32
Mild Persistent Asthma	25	16	41
Moderate Persistent Asthma	13	8	21
Severe Persistent Asthma	4	2	6

A statistically significant association was observed between family history and severity pattern of bronchial asthma ($p = 0.042$).

Table 8: Association Between Family History and Severity of Asthma

Severity Pattern	Positive Family History	Negative Family History	Total
Intermittent Asthma	10	22	32
Mild Persistent Asthma	19	22	41
Moderate Persistent Asthma	12	9	21
Severe Persistent Asthma	5	1	6
Total	**46**	**54**	**100**

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Chi-square test = 8.21, df = 3, p = 0.042*

DISCUSSION:

Bronchial asthma is one of the most common chronic respiratory disorders affecting children and contributes significantly to pediatric morbidity worldwide. The present study evaluated the clinical profile and severity pattern of bronchial asthma among children attending a tertiary care hospital over a period of six months.

In the present study, the majority of children belonged to the age group of 5–10 years (62%). Similar findings were reported by Sharma et al., who observed higher prevalence of asthma among younger school-aged children.[9] Increased exposure to environmental allergens, respiratory infections, and immature airway physiology in younger children may contribute to higher disease occurrence in this age group.

Male predominance was observed in the present study, with males accounting for 63% of cases and a male-to-female ratio of 1.7:1. Similar male predominance has been documented in studies conducted by Gupta et al. and Singh et al.[10,11] The higher prevalence among males during childhood may be related to smaller airway caliber and increased airway responsiveness compared to females.

Cough was the most common presenting symptom observed in 92% of children, followed by wheezing (88%) and breathlessness (81%). These findings are comparable to those reported by Bener et al., where wheezing and recurrent cough were the predominant clinical manifestations.[12] Nocturnal symptoms were observed in more than half of the children, indicating inadequate symptom control and increased airway hyperreactivity.

Among triggering factors, dust exposure was the most common factor identified in 58% of children, followed by respiratory infections and seasonal variation. Similar observations were made by Pal et al., who reported environmental allergens and respiratory tract infections as major precipitating factors for asthma exacerbations.[13] Exposure to indoor pollutants, smoke, and dust mites plays a significant role in worsening asthma symptoms in children.

Family history of asthma was present in 46% of study participants, indicating the importance of genetic predisposition in the development of bronchial asthma. Similar findings were reported by Pawankar et al., who emphasized the association between atopy, allergic disorders, and asthma occurrence.[14] Allergic rhinitis was the most common associated allergic condition observed in the present study. The coexistence of allergic conditions supports the concept of atopic predisposition among asthmatic children.

In the present study, mild persistent asthma was the most common severity pattern observed in 41% of children, followed by intermittent asthma in 32%. Moderate persistent and severe persistent asthma were observed in 21% and 6% of children respectively. Similar findings were reported in studies conducted by Sharma et al. and Kumar et al., where mild persistent asthma constituted the predominant severity category.[9,15] Early diagnosis and availability of inhalation therapy may contribute to reduced occurrence of severe persistent asthma.

CONCLUSION:

Bronchial asthma was more common among younger children and males in the present study. Cough, wheezing, and breathlessness were the common clinical manifestations. Dust exposure, respiratory infections, and seasonal variations were identified as major triggering factors. Mild persistent asthma was the most common severity pattern observed.

A positive family history and associated allergic conditions were frequently seen among asthmatic children. Early diagnosis, avoidance of triggering factors, appropriate treatment, and regular follow-up are important for effective disease control and reduction of asthma-related morbidity.

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