Clinical Profile and Triggers of Childhood Asthma among Patients Diagnosed at Paediatric Asthma Clinic

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ABSTRACT

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Background: Epidemiological studies from different parts of the world have confirmed that asthma prevalence is increasing in the world, especially in the developing countries. This study was on the profile of childhood asthma and various triggering factors of bronchial asthma among patients attending paediatric asthma.

Materials & Method: A hospital based descriptive study conducted among 100 children attended in asthma clinic, and diagnosed as bronchial asthma, from January 2014 to February 2015. The study was conducted in a tertiary care teaching hospital in Kerala State of India.

Results: Majority, 54% (54/100) of the bronchial asthma patients registered in Paediatric asthma clinic was in the age group of 5-8 years. 37% (37/100) children were suffering from moderate persistent bronchial asthma, 29% (29/100) intermittent variety and 11% from severe asthma. 51% of patients were found to have a positive family history of bronchial asthma, and 17% have family history of allergic rhinitis.

Conclusion: The severity of bronchial asthma increases mainly at the level of school entry. Most of the cases have positive bronchial asthma or allergic rhinitis family history. Exacerbation of bronchial asthma is associated with triggering factors which can be better avoided.

Keywords: Bronchial Asthma, Childhood, Airway Disease, Respiratory Disease, Pulmonary

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INTRODUCTION

Asthma is a major cause of chronic morbidity and mortality throughout the world and there is evidence that its prevalence has increased considerably over the past 20 years, especially in children.[1] It is now estimated that as many as 300 million people of all ages, and all ethnic backgrounds, suffer from asthma and the burden of this disease to governments, health care systems, families, and patients is increasing worldwide.[2] Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation in which many cells and cellular elements play a significant role. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and in intensity, together with variable expiratory airflow limitation. In asthma the environmental and genetic factors are implicated in causation. The rapid rise in asthma during the 1980s and 1990s was too abrupt to be explained solely by change in prevalence of genetic variations.[3] Even though genetic predisposition is one of the factors in children for the increased prevalence –urbanisation, air pollution and environmental tobacco smoke contribute more significantly.[4]

Asthma causes symptoms such as wheezing, shortness of breath, chest tightness and cough that vary over time in their occurrence, frequency and intensity. These symptoms are associated with variable expiratory airflow, i.e. difficulty breathing air out of the lungs due to bronchoconstriction (airway narrowing), airway wall thickening, and increased mucus. Some variation in airflow can also occur in people without asthma, but it is greater in asthma. Factors that may trigger or worsen asthma symptoms include viral infections, domestic or occupational allergens (e.g. house dust mite, pollens, and cockroach), tobacco smoke, exercise and stress.[5] These responses are more likely when asthma is uncontrolled. Some drugs can induce or trigger asthma, e.g. beta blockers, and (in some patients), aspirin or other NSAIDs. Asthma flare ups (also called exacerbations or attacks) may occur, even in people taking asthma treatment. When asthma is uncontrolled, or in some

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high-risk patients, these episodes are more frequent and more severe, and may be fatal.[5] History of allergic rhinitis, eczema, atopic dermatitis and food allergies, cesarean delivery, frequent use of antibiotics within 1 year of age, use of decorating materials on the wall, and use of heating in winter may increase risk for asthma, and use of antibiotics in older age is a protective factor against asthma in children.[6]

Thus a number of factors are responsible either in the causations or exacerbations of bronchial asthma and it becomes extremely important to recognize the various causative factors responsible in order to mange asthma effectively.[7] This study was done to identify the clinical profile of children with bronchial asthma attending asthma clinic a tertiary care centre in a rural settings, and various triggering factors of bronchial asthma exacerbation.

MATERIALS AND METHODS

This hospital based descriptive study was carried at Asthma clinic at Pediatrics Department, Sree Gokulam Medical College in Kerala State of India from January, 2014 to December, 2010. A total of 100 children of 1 to 12 years, who newly diagnosed as bronchial asthma were included in this study.

Diagnosis was made on the basis of detailed history and clinical examination of each patient. Once they had given consent for participation in the study, the parents were interviewed in their mother tongue and information was collected concerning the familial history of asthma, allergy, comorbidities, number of hospital admissions and duration of symptoms prior to treatment. Each child was followed up for one year, and clinical response to treatment with long acting beta agonists and its compliance were assessed and recorded at 3rd month, 6th month and one year of follow up. Data regarding their demographic profile, familial history of asthma, allergy, comorbidities, number of hospital admissions, symptoms during treatment. Each child was followed up for one year and clinical response to treatment and compliance were collected on a well structured proforma.

Informed ethical consent was taken from Institutional Ethical Committee. Data were entered in Statistical Package for Social Sciences (SPSS version 20). Analysis of the data was done using descriptive statistics. Descriptive statistics were computed according to the type of the variable. The means (standard deviations) was computed for continuous variables, while categorical variables were assessed by computing frequencies.

RESULTS

A total of 100 children of 1-12 years, who were include in the study and followed up for 1 year. The mean age was calculated as 7.66 (SD = 2.72) years. Out of these 100 subjects, 68% of the children were boys and remaining 32% were girls. Majority, 54% (54/100) of the bronchial asthma patients registered in Paediatric asthma clinic was in the age group of 5-8 years, and only 12% 912/100) of the patients belongs to 1-4 years age group **(Table 1)**

Table 1. Age distribution of patients with bronchial asthma

Age group	Number of cases	Percentage
1-4 yrs	12	12%
5-8 yrs	54	54%
9-12 yrs	34	34%

Bronchial asthma classification was done based the guideline and found that 37% (37/100) children were suffering from moderate persistent bronchial asthma, 29% (29/100) intermittent variety, 23% (23/100) mild persistent and 11% (11/100) from severe persistent bronchial asthma **(Table 2)**.

Of the hundred children followed up, 51% were found to have a positive family history of bronchial asthma, and 17% have family history of allergic rhinitis. Out of the 51% with family history of bronchial asthma, 27 % of the children had positive parental history of bronchial asthma (16% had maternal history), 19% children had a positive history in grandparents (10% had a history in grandmother) and 5% children had a positive history of bronchial asthma in siblings. Also 17% children had a positive family history of allergic rhinitis **(Table 3).**

Out of the hundred children followed, 67% of children were found to have a positive history of triggering factors for an acute exacerbation. Majority of the children, 21% had exposure to dust as a triggering factor when compared to cold, which was 5%. However, 27% of children were found to have both cold and dust exposure as triggering factors. 3 % children developed an acute exacerbation following exposure to cold and

Table 2. Distribution of cases according to severity

Diagnosis	No. of cases
Intermittent	29
Mild persistent	23
Moderate persistent	37
Severe persistent	11
Total	100

Table 3. Distribution of cases based on family history

Positive family history	Frequency
Allergic rhinitis	12
Father	6
Mother	10
Father and mother	1
Bronchial asthma	
Father	11
Mother	16
Grand parents	19
Siblings	5
No family history	32
Total	100

Table 4. History of triggering factors

Allergic history	Frequency
Pets	11
Cold alone	5
Cold and dust	27
Cold ,dust and exercise	3
Dust alone	21
No allergy	33
Total	100

dust, along with exercise. While 11% children had pets as triggering factor **(Table 4).**

DISCUSSION

In this study, the majority (88%) of the children diagnosed to have bronchial asthma belonged to the age group of 5-12 years, that is in school going age group. Only 12% had bronchial asthma in 1-4 years age group. The reported prevalence of ever having asthma increased among 6-11-year-old children between the first (1971 to 1974) and second (1976 to 1980) National Health and Nutrition Examination Surveys in United States.[8] In children aged 6–7 years, the prevalence of asthma ever ranged from 4.1–26.9%, and the prevalence of wheezing in the last 12 months ranged from 8.6–32.1%.[9] A survey conducted in 106 centres in 56 countries among children of 13–14 years of age and in 66 centres in 37 countries in children of age 6–7 years of age reported to have had asthma at some time in their lives increased by 0.28% per year in the 13–14 year age group and by 0.18% per year in the 6–7 year age group.[10]

Recent studies confirm the disturbing trend toward increased morbidity and mortality from childhood asthma and offer some insights into possible contributing factors.[11] Asthmatic children had a higher prevalence of other allergies (42.6% v 13.2%, $P < .01$) and of allergen skin test reactivity (44.5% v 20.7%, $P < .01$) than nonasthmatic children, and most asthmatics had their first asthmatic episode before their third birthday.[8]

In a multivariate analysis, close indoor animal contact, outdoor animal contact, and exclusive breastfeeding for at least 6 months were associated with lower atopic sensitization; mud flooring was associated with lower self-reported wheezing.[12] The severity of asthma was related to concomitant exposure to endotoxin in house dust, since the concentration of house dust endotoxin.[13] Study by Leonard B et al shows, when asthma severity was based on the higher severity of asthma symptom frequency or medication use, asthma was mild intermittent in 6.9% of participants, mild persistent in 27.9%, moderate persistent in 22.4%, and severe persistent in 42.9%.[14] In our study, the majority of the cases are moderate persistent (37%) and intermittent (29%) in severity.

In this study, the exposure to dust, cold, and exercise were found to be the major factors which trigger the exacerbation. Common allergens that are known to trigger asthma were detected in all school environments, where asthma prevalence rates were high.[15] Avoidance of asthma triggers may reduce exacerbation rates and improve asthma-related quality of life in patients with severe or difficult-to-treat asthma.[16] Adequate asthma management depends on an accurate identification of asthma triggers.[17]

CONCLUSION

The severity of bronchial asthma increases mainly at the level of school entry, especially in 5-8 years age group. Most of the cases have positive bronchial asthma or allergic rhinitis family history. Exacerbation of bronchial asthma is associated with triggering factors which can be better avoided. Early identification of children with persistent asthma, along with proper classification of severity and medication will help to overcome the childhood asthma morbidity and mortality.

END NOTE

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