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Original Research Article

Prevalence of bronchial asthma and its associated factors among children of known population: an epidemiological study

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ABSTRACT

Background: Asthma is widely known as a multifactorial respiratory disorder with both genetic and environmental underlying risk factors. Exposures to common allergens and air pollution from various sources have all been implicated as triggers of the disease. Chronic respiratory diseases are leading cause of death worldwide. The objective of this study was to study the prevalence of bronchial asthma and its associated factors among children of known population.
Methods: Community-based cross-sectional study consisting of 400 children. Data was obtained from two government schools and two private schools. Both males and females aged below 10 years were selected for the study. A pretested and validated questionnaire was designed.
Results: The prevalence of asthma in current asthmatics in present study was found to be 20%. The prevalence rate was higher among those with family history of asthma. 82.5% current asthmatics were suffering from rhinitis.
Conclusions: Asthma is a common problem faced in today world especially in children the symptoms and risk factors should not be ignored. Those with family history of asthma should take precautions.

Keywords: Air pollution, Asthma, Children, Chronic respiratory diseases

INTRODUCTION

Chronic respiratory diseases (CRDs) are among the leading causes of death worldwide, with asthma rated the most common chronic disease affecting children.[1] Globally, about 300 million people have asthma, and current trends suggest that an additional 100 million people may be living with asthma by 2025. The World Health Organization (WHO) estimates about 250 000 deaths from asthma every year, mainly in low- and middle-income countries (LMIC) Just like with many other chronic diseases in Africa, the fast rate of urbanization has been linked to the increase in the burden of asthma and other allergic diseases. Bronchial asthma is considered to be a serious threat among children's. Studies have shown that In the year 2004, India accounted for 277 Disability Adjusted Life Years lost per 1, 00,000 population and 57,000 deaths.[2] According to the literature prevalence of bronchial asthma among school children of the age group between 15 to 19 years in India is 0.9%, whereas other studies have shown results ranging from 1.9% to 16.6% in different age groups.[3]

Exposure to allergens like pollens, dust mites, and animal furs and air pollution from various sources like traffic pollution, combustion of fossils and biomass fuels, workplace dust have all been implicated as triggers of the disease. Second hand tobacco smoking is a confirmed risk factor in pediatric patients. Viral infections, a major cause of upper respiratory tract infections and "common cold," are also a common risk factor in children.[4]

So, we aimed to assess the prevalence of bronchial asthma among children of known population and to assess various risk factors associated with bronchial asthma among children.

METHODS

Community-based cross-sectional study was planned. 400 children both males and females were included in the study. Data were collected from two government schools and two private schools. Study period included was from May 2018 to July 2018. Prior written permission will be obtained from the principals of schools to allow the students to participate in the study.

A pretested and validated questionnaire was designed. The questionnaire was translated to the local language and translated back into English to ensure reliability and validity. After obtaining the informed consent, the designated respondent were interviewed as per the questionnaire. A child with symptom of wheezing or whistling in the chest in the past will be considered as criteria for defining asthma. Other symptoms associated with asthma, which included numbers of attacks of wheezing, sleep and speech disturbance, and nocturnal cough, was collected.

Patient's guardians/parents were informed and explained about the purpose and procedure of the study. Ethical committee clearance was obtained prior to the study.

A written informed content was obtained from the patient. A semi-structured Performa containing data regarding age and associated factors that include family history of asthma, type of fuel used, placement of kitchen in the house, number of windows in sleeping room, pet animals, smoking among family members, birth order, and smoke outlet were collected.

Inclusion Criteria

- Subjects less than 10 years of age
- Subjects who gave informed consent

Exclusion Criteria

- Subjects more than 10 years of age
- Subjects with presence of any other respiratory pathology

Statistical Analysis

All the results were analyzed by SPSS software version 17.0. Chi- square test, one-way ANOVA and student t test will be used for assessment of level of significance. The findings were expressed in terms of proportions or percentages. Univariate analysis was carried out for associated factors to test the differences between proportions. P- Value of less than 0.05 will be taken as significant.

RESULTS

A total of 400 subjects aged above 10 years were included in the present study.

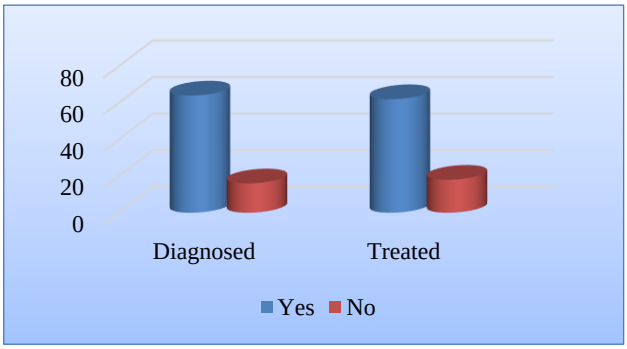

Figure 1: No of patients diagnosed/ treated.

Of the 400 samples selected 80 showed symptoms related to asthma. Out of 80 children with current symptoms of asthma 45 complaint of 1 to 3 attacks of wheezing i.e. 56.3%, 35/80 said their frequency of wheezing was more than 4 i.e. 43.7%.

Table 1: Distribution of symptoms in asthma.

Symptoms	No of patients N =80
Number of attacks of wheezing	
1-3	45 (56.3%)
>4	35 (43.7%)
Sleep disturbance	
Never	30 (37.5%)
< one night per week	30 (37.5%)
> one night per week	20 (25%)
Speech disturbances	
Yes	26 (32.5%)
No	54 (67.5%)
Nocturnal dry cougH	
Present	47(58.7%)
Absent	33 (41.2%)
Cold/ rhinitis	
Present	66 (82.5%)
Absent	14 (17.5%)

30/80 reported no sleep disturbance i.e. 37.5%, 30/80 said sleep disturbance was less than one day i.e. 37.5% and 20/80 i.e. 25% reported sleep disturbance more than one day. 32.5% reported speech disturbance (26/80) whereas 54/80 i.e. 67.5% said there was no speech disturbance. 57.8% reported with nocturnal dry cough and 41.2% said cough was absent. 66/80 i.e. 82.5% reported with rhinitis whereas only 17.5% said they were not affected by cold (Table 1). Of the 80 current asthmatics, 64 were diagnosed earlier and 62 were treated (Figure 1).

Of the 400 children examined 80 had family history of asthma. 17.5% with family history of asthma were

affected by wheezing and 5.6% children were suffering from wheezing without family history of asthma. The prevalence rate of asthma was found to be higher among children with family history.

Table 2: Associated factors of asthma.

Variables	Total number	Subjects with wheezing
Family history		
Yes	80	14 (17.5%)
No	320	18 (5.6%)
Type of fuel used		
Firewood	15	2 (13.3%)
Gas	362	21 (5.8%)
Electricity	23	0
Placement of kitchen in the house		
Inside	345	22 (6.3%)
Outside	55	3 (5.4%)
Windows in sleeping room		
Nil	42	3 (7.1%)
1	200	18 (9%)
>1	158	6 (3.7%)
Smoking among family members		
Yes	166	24 (14.4%)
No	234	8 (3.4%)
Smoke outlet		
Yes	102	2 (1.9%)
No	298	44 (14.7%)

Of the 400 subjects 15 said they used firewood in home, 362 said gas and 23 said electricity. Number of asthmatics was found more among fuel users i.e. 13.3% and 5.8% among gas users. 345/400 said the placement of kitchen was inside and number of asthmatics in such family was 22 i.e. 6.3%. Number of children suffering from asthma was more in house without window (7.1%) or less than 1 window (9%). Prevalence rate was high in those children those who had other family members smoking i.e.14.4% (Table 2).

DISCUSSION

Children with wheezing persisting to adulthood have a fixed decrement in lung function as early as age 7 or 9 years. Recent studies of preschool children have documented abnormal lung function in children with persistent wheezing as young as age 3 years. However, some infants in whom persistent wheezing develops have normal lung function shortly after birth, which suggests a critical period of exposures within the first few years of life, before the development of these persistent abnormalities in expiratory flows. In contrast, infants who exhibit early transient wheezing have decreased airflow shortly after birth.[5]

Asthma comprises a range of heterogeneous phenotypes that differ in presentation, etiology and pathophysiology. A family history of asthma is a common risk factor; it is neither sufficient nor necessary for the development of asthma. In present study 17.5% children suffering g from wheezing had family history of asthma. Furthermore, environmental triggers may affect asthma differently at different times of a person's life, and the relevant risk factors may change over time.[6] Studies have shown that 50% of preschool children have wheezing, however only 10%–15% have a diagnosis of "true" asthma by the time they reach school age.[7] Based on the result of present study it was found that of the 80 current asthmatics 62 were diagnosed earlier.

Various authors have reported regarding the prevalence of asthma, study conducted in Bangalore reported prevalence of 19.34%. Our results are similar to those reported by the authors.[8] Another study conducted among urban school children aged 5-15 years showed the prevalence of asthma as 7.59%.[9]

Studies have shown that prevalence rate is higher among those with a family history of bronchial asthma similar to other studies, we are in agreement with the authors.[9,10] Agrawal S in their study suggested that Indoor air pollution due to biomass or solid fuel combustion is an important risk factor in the Indian setting.[11] In present study the prevalence rate was higher among those children whose family used firewood.[12] Few studies have reported association of passive tobacco smoking and asthma however the association of tobacco and asthma was not examined in current study.[13-15]

CONCLUSION

Asthma among school children is very common. Based on the results of current study we suggest that risk factors like family history, fuel used, placement of kitchen, no of windows are important and should not be ignored. Symptoms like rhinitis sleep disturbances, speech difficulty, frequency of wheezing and presence of dry cough can serve as a warning alarm.14 Further studies are required to explore the risk factors of bronchial asthma among children in different geographical regions.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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