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Prevalence of bronchial asthma among children aged between 7-10 years in selected schools, Chittoor

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Abstract

Background: In India, rough estimates indicate a prevalence of between 10% and 15% in 5-11 year old children.

Aim: The objective is to assess the prevalence of bronchial asthma among school children and to associate the relationship between demographic variables and prevalence of bronchial asthma.

Materials and methods: By using quantitative research approach a descriptive study was adopted. The study was conducted in various schools of Chittoor. Convenient sampling technique was used. Prevalence of bronchial asthma was assessed in 1913 children aged between 7- 10 years by using structured questionnaire. The children were asked to get the questionnaire filled from their parents and return it within 3 days.

Results: The findings reveal that the prevalence of bronchial asthma in school children aged between 7-10 years was 10.82%. Majority, 49.2% had frequent intermittent coughing 5-6 times in a year, 32.2% had wheezing 3-4 times a day, 53.29.9% experienced wheezing 1-2 times in a year, 29.9% experienced trouble sleeping due to cough, wheezing or shortness of breath 3-4 times in a year, 38.4% had trouble breathing limiting play/exercise/school/normal activities 5-6 times in a year and 35% had fatigue due to poor sleep 1-2 times in a year. There was a significant association between prevalence of bronchial asthma and age, family history of asthma and history of allergies at $P < 0.05$ level.

Conclusion: The prevalence of bronchial asthma is found to be high. So there is a need for implementation of various control programs to reduce school absenteeism.

Keywords: Prevalence, bronchial asthma, children

1. Introduction

Asthma is among the top 20 chronic conditions for global ranking of disability-adjusted life years in children; in the mid-childhood ages 5–14 years it is among the top 10 causes. The burden of asthma, measured by disability and premature death, is greatest in children approaching adolescence; ages 10-14 and the elderly; ages 75-79. 14% of the world's children experience asthma symptoms.

There is also a global concern on the change in asthma epidemiology and clinical spectrum. The proportion of Indian school children suffering from bronchial asthma has increased to more than double in the last 10 years. The increase in prevalence of asthma in children may have serious implications in their adult life, as 40% of children with trivial wheeze and 70–90% of those with troublesome asthma continue to have symptoms in mid-adult life. Children with asthma also have an increased risk of school absenteeism and hospitalizations when compared with unaffected children.

There is very limited data on asthma epidemiology from the developing world, including India. The overall burden of asthma in India is estimated at more than 15 million patients. However, India is a vast country with immense geographical, economical, racial, religious and socio-political diversity. There are obvious differences in prevalence of disease and approach to management of health problems.

An observational study conducted in 6-12 years school going children of Agra district stated the prevalence of bronchial asthma among school children as 7%. There were 61.4% male and 38.6% female patients having the disease. It was revealed that the upper classes and non-vegetarian children had the largest number of students suffering from bronchial asthma.

A cross sectional study was conducted in four secondary schools in Davangere district among 550 school children. The overall prevalence of asthma is 4.5%. Boys had a higher

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prevalence 5.14% than girls 3.77%. Maximum numbers of positive cases were found at the age of 15 years. 32% had wheezing or whistling in the chest in the past 12 months. From last 12 months, 24% had attack of wheezing, maximum number of children had 4-12 attacks of wheezing.

There is very limited data on asthma epidemiology from the developing world, including India. There are obvious differences in prevalence of disease and approach to management of health problems. Although Asthma cannot be cured, clinical episodes can largely be prevented and controlled by proper management.

2. Objectives

1. To find out the prevalence of bronchial asthma among school children aged between 7-10 years of age in selected schools of Chittoor.
2. To associate the relationship between demographic variables and prevalence of bronchial asthma among school children.

3. Methodology

Quantitative research approach was employed in the present study. By using descriptive research design, the prevalence of bronchial asthma among school children was determined. The study was conducted at various schools in Chittoor. Prior permission has been obtained from the headmaster/headmistress of the school. The population was

parents of children aged between 7-10 years of age. A sample of 1913 children from 5 schools in Chittoor was selected by using convenient sampling technique. Reliability of questionnaire related to prevalence of bronchial asthma was 0.80.

The prevalence questionnaire has been distributed to school children studying in second, third, fourth and fifth standard aged between 7-10 years of age to get filled from their parents and return it within 3 days. A structured questionnaire consists of questions on demographic variables and questions related to prevalence and symptoms of bronchial asthma.

The structured questionnaire consists of two parts; Part-I consists of demographic variables; age, sex, place of residence, fathers education; mothers education, occupation of the father, occupation of the mother, family income, type of family, habit of smoking in family members, fuel used for cooking, smoke outlet in the house, school location, family history of asthma and history of allergies. Part-II consists of questions related to prevalence of bronchial asthma and frequency of symptoms of asthma.

A descriptive statistics of frequency and percentage was used to analyze the demographic variables and inferential statistics of chi-square was used to associate the relationship between demographic variables and prevalence of bronchial asthma.

4. Results

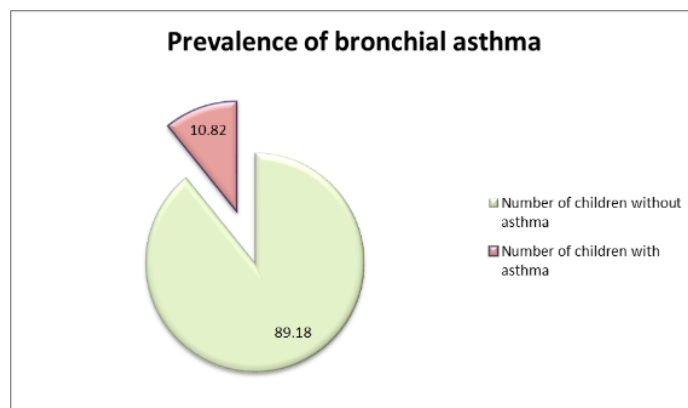


Fig 1: Prevalence of bronchial asthma in School children

Figure-1 Shows, out of 1913, 1706(89.18%) were non asthmatics and 207(10.82%) were asthmatics. The overall

prevalence of asthma in school children aged between 7-10 years of age is 10.82%.

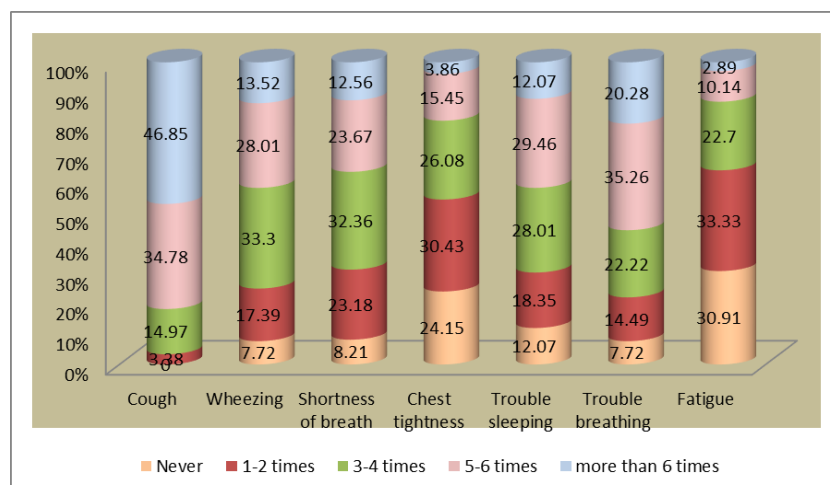


Fig 2: Distribution of number of episodes of symptoms among asthmatic children during the past 1 year

Figure-2 represents the number of episodes of symptoms among asthmatic school children. Out of 207 asthmatic school children, majority 87(49.2%) had frequent intermittent coughing 5-6 times in a year. With regard to wheezing sound during exhalation, majority 59(33.3%) had wheezing 3-4 times in a year and 16(9%) never experienced. With respect to shortness of breath, majority 57(32.2%) had 3-4 times a day and 16(9%) had more than 6 times in a year. In accordance with chest tightness, majority 53(29.9%) experienced 1-2 times in a year and only 8(4.5%) had more than 6 times in a year.

In consideration with trouble sleeping due to cough, wheezing, shortness of breath majority 53(29.9%) experienced 3-4 times in a year and only 15(8.5%) never had trouble sleeping due to cough, wheezing or shortness of breath.

Pertaining to trouble breathing limiting play/exercise/school/normal activities majority, 68(38.4%) had 5-6 times in a year and only 11(6.2%) never had the symptom of trouble breathing.

In relation to fatigue due to poor sleep, most of the children 62(35%) had fatigue 1-2 times in a year and only 6(3.4%) had more than 6 times in a year.

Table 1: Association between demographic variables and prevalence of bronchial Asthma N=1913

S. No	Variables	Yes		No		Chi square	P value
		N	%	N	%		
Age in years							
1	a. 7-8 years	126	12.3	902	87.7	4.749	0.029
	b. 9-10 years	81	9.2	804	90.8		
Sex							
2	a. Male	105	12.0	772	88.0	2.227	0.136
	b. Female	102	9.8	934	90.2		
Place of Residence							
3	a. Rural	108	10.1	958	89.9	1.186	0.276
	b. Urban	99	11.7	748	88.3		
Education of Father							
4	a. Illiterate	43	11.9	317	88.1	3.188	0.527
	b. Primary education	47	8.8	486	91.2		
	c. Secondary education	61	11.3	480	88.7		
	d. Higher secondary education	44	11.8	330	88.2		
	e. Degree and above	12	11.4	93	88.6		
Education of Mother							
5	a. Illiterate	33	9.8	303	90.2	6.809	0.146
	b. Primary education	40	8.6	426	91.4		
	c. Secondary education	61	10.7	509	89.3		
	d. Higher secondary education	60	13.6	381	86.4		
	e. Degree and above	13	13	87	87.0		
Occupation of mother							
6	a. Housewife	56	9.7	519	90.3	1.676	0.892
	b. Laborer	37	10.9	303	89.1		
	c. Agriculture labor	28	10.6	236	89.4		
	d. Business	40	11.8	300	88.2		
	e. Employee	32	11.1	256	88.9		
	f. Other	14	13.2	92	86.8		
Occupation of Father							
7	a. Laborer	24	9.8	220	90.2	1.455	0.835
	b. Agriculture labor	35	10.8	288	89.2		
	c. Business	46	10.0	415	90.0		
	d. Employee	69	12	505	88.0		
	e. Other	33	10.6	278	89.4		
Family Income per month							
8	a. Less than Rs.5000	31	7.8	365	92.2	5.631	0.228
	b. Rs. 5001-10000	50	11.0	403	89.0		
	c. Rs. 10001-15000	59	11.0	475	89.0		
	d. Rs. 15001-20000	48	12.4	339	87.6		
	e. Rs. 20001-25000	19	13.3	124	86.7		
Family Type							
9	a. Joint family	83	10.9	681	89.1	0.002	0.960
	b. Nuclear Family	124	10.8	1025	89.2		
Habit of smoking in family members							
10	a. Yes	53	10.2	468	89.8	0.312	0.577
	b. No	154	11.1	1238	88.9		
Fuel Used for Cooking							
11	a. Firewood	15	9.5	144	90.5	0.438	0.803
	b. Gas	192	10.9	1562	89.1		
Smoke outlet							
12	a. Yes	123	10.3	1070	89.7	0.856	0.355

	b. No	84	11.7	636	88.3			
	School Location							
13	a. Outer City	62	10.8	511	89.2	1.716	0.424	
	b. Inner city	82	11.9	607	88.1			
	c. Rural	63	9.7	588	90.3			
	Family History of Asthma							
14	a. Yes	148	35.4	270	64.6	33.35	0.000	
	b. No	59	3.9	1436	96.1			
	History of allergies							
15	a. Yes	173	47.4	192	52.6	66.25	0.000	
	b. No	34	2.2	1514	97.8			

Table-1 shows, out of 1913 children; 126(12.3%) aged between 7-8 years were asthmatics whereas in children aged between 9-10 years 81(9.2%) were asthmatics. There was a significant association between prevalence of bronchial asthma and age.

Higher prevalence of asthma is seen in males 105(12%) compared to females 102(9.8%). Children residing in urban area 108(11.7%) had higher prevalence of asthma than children residing in rural areas 99(10.1%). There was no significant association between gender, place of residence with respect to prevalence of bronchial asthma.

Pertaining to education of the father, majority 61(11.3%) had bronchial asthma whose fathers were secondary educated and only 12(11.4%) had bronchial asthma whose fathers had degree and above. With respect to mother's education, prevalence of asthma was 61(13.6%) whose mother's had higher secondary education and prevalence of 13(13%) was seen in children whose mothers were degree and above. There was no significant association between prevalence of bronchial asthma and education of the father or mother.

With regard to mothers occupation, majority 56(9.7%) of mothers were house wives whose children were asthmatics and only 14(13.2%) children had asthma whose mothers were doing various other occupations. Pertaining to father's occupation; majority 69(12%) were employees and only 24(9.8%) were laborers. There was no significant association between prevalence of bronchial asthma and occupation of the mother and occupation of the father.

Majority 59(11%) had prevalence of asthma whose family income was between Rs. 10,001-15,000 and only 19(13.3%) of children with asthma had family income between Rs.20,001-25,000. 83(10.9%) had bronchial asthma whose family type is joint family and 124(10.8%) belongs to nuclear families.

On the basis of habit of smoking among family members; 154(11.1%) children with bronchial asthma belongs to the families who don't have the habit of smoking among their family members and 53(10.2%) belongs to the families who have the habit of smoking among the family members. Majority of children's family 192(10.9%) used gas as the fuel for cooking and only 15(9.5%) used firewood for cooking. 123(10.3%) children with bronchial asthma don't have smoke outlet in their houses and remaining 84(11.7%) had smoke outlet in their houses. There was no significant association between prevalence of bronchial asthma and habit of smoking among family members, fuel used for cooking, smoke outlet and habit of smoking.

In consideration with school location, 82(11.9%) were studying in school located in the inner city and 63(9.7%) were studying in schools in rural areas and 62(10.8%) were studying in schools located in outer city. There was no

significant association between prevalence of bronchial asthma and school location.

148(35.4%) children with bronchial asthma have a family history of asthma and remaining 59(3.9%) of children with bronchial asthma don't have the family history of asthma. 173(47.4%) of children with asthma had history of allergies and 34(2.2%) of children with asthma don't have the history of allergies. There was a significant association between prevalence of asthma and family history of asthma as well as history of allergies

5. Discussion

The prevalence of bronchial asthma in the present study is 10.8%. Different studies had shown a varying prevalence of asthma. A prevalence study conducted by Narayanappa *et al.*, shows number of asthmatic children in different age groups as 8.11% in 5-8 years and 7.65% in 9-11 years. A prevalence of 7.5% was seen in children between 5-15 years of age in a study conducted by Kamaldeep *et al.*, in Ludhiana. Similarly in a study conducted by Arvind *et al.*; the prevalence of questionnaire diagnosed asthma among 331 school going children studied was found out to be 13.9%.

Prevalence of asthma among school children in the present study is 12% in boys and 9.8% in girls. There was a significant association between prevalence of bronchial asthma and family history of asthma at $P < 0.05$ and no association is seen with respect to education of the father, education of the mother, occupation of the mother and occupation of the father and family income. The similar findings have been seen in a study conducted by Jain *et al.*, which shows boys had a higher prevalence of asthma (12.1%) compared to girls (8.4%) and the male to female ratio for prevalence was found to be 1.5:1. There was no association of bronchial asthma with socioeconomic status or parents' literacy level.

The current study shows there was a significant association between prevalence of bronchial asthma and family history of asthma and there was no significant association with habit of smoking among family members. Behl, *et al* stated that there is a significant association between asthma prevalence and family history of asthma and other atopic manifestations. A study conducted by Ganesh *et al.*, also proved that the prevalence was significantly more among those with a family history of asthma and having smoking habits in any of the family members.

The findings also prove that there was a significant association between prevalence of bronchial asthma and family history of asthma as well as history of allergies. The findings were supported by Arvind *et al.*

6. Conclusion

The prevalence of asthma among school children aged between 7-10 years of age in Chittoor is 10.82. There was a significant association between demographic variables and age of the child, family history of asthma and history of allergies at $P < 0.05$ level. The prevalence of asthma in school children is high. So, there exists a need to control asthma through proper health education which in turn reduces the economic burden and school absenteeism.

7. Recommendations

- Similar study can be conducted on larger population.
- A comparative study can be done between different age groups.
- The quality of life of asthmatic school children can be assessed to identify the areas of impairment.
- Health education to parents or teachers or care givers can be planned.
- Structured teaching on breathing exercises can be planned and implemented.

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