



## PREVALENCE OF UNDIAGNOSED BRONCHIAL ASTHMA IN SCHOOL GOING CHILDREN OF AGE GROUP 5-15 YEARS IN CENTRAL INDIA

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### ABSTRACT

**BACKGROUND:** Limited community-based studies cause paucity of data on prevalence of asthma among school-going children in India.

**AIM:** To determine the prevalence of undiagnosed asthma in school-going children of age group 5-15 years in various localities of Bhopal, India.

**MATERIAL AND METHOD:** This cross-sectional study was done in both government and private schools of Bhopal, each one from one zone of the city, using multi-stage cluster sampling technique. Modified ISAAC questionnaire was provided for the parents to fill and PEFR measurements of the included children was done. Any child who was a known case of asthma or any other respiratory/chronic systemic illness was excluded from the study.

**RESULTS:** The prevalence of undiagnosed asthma was found to be 14.9%. This was higher in males(17.65%) and in children of 5-8 years age group(16.66%). Association of various risk factors with asthma in children was not found to be statistically significant.

**CONCLUSION:** There is a high proportion of undiagnosed asthma in school going children. More studies are required to solidify this data and increase awareness amongst the children, their parents and the society.

**KEYWORDS :** Bronchial Asthma, Prevalence, School, Children

### INTRODUCTION:

Asthma in childhood is a chronic respiratory disease characterised by episodes or attacks of impaired breathing. It is defined as a chronic inflammatory condition of airways that is associated with increased responsiveness to a variety of stimuli and when severe often results in increase morbidity of the patient and indirect economic loss of the community. The prevalence of Bronchial Asthma has increased continuously the previous three decades, and now affects an estimated 4 to 7% of the people worldwide.[1,2] Asthma can considerably impair the child's social interaction and academic achievement. It can affect child's ability to enjoy and participate in activities such as playing a musical instrument and sporting events, and even affect sleep patterns. Due to poor school attendance and performance, it jeopardise their academics and carrier.[3] Childhood asthma can even lead to severe psychosocial disturbances in the family and also places strain on healthcare resources as a result of doctor and hospital visits and the cost of treatment.[4]

### MATERIAL AND METHODS:

This was a cross sectional study, conducted in the Department of Pediatrics, Kamla Nehru Hospital, Bhopal, Madhya Pradesh, India during the period of October 2016 to July 2017. The study utilised a modified ISAAC questionnaire, which was given to children and asked them to be filled by their parents. Peak expiratory flow rate(PEFR) was also analysed. The study was done in both government and private schools in Bhopal city. Children between 5-15 years of age and schools whose director or principal had given permission to conduct PEFR test were included in the study. Children who were known case of asthma, suffering from other respiratory diseases or any other chronic diseases and those suffering from infection of upper respiratory tract were excluded. Those schools which did not permit to conduct PEFR were not included in the study.

### Sampling Technique:

Multi - stage cluster sampling technique was used for this study. The target population in this study was primary school pupil aged 5 to 15 years old from both urban and rural

communities of Bhopal. Whole Bhopal city has been divided in to 5 zones (east, west, south, north and central zone) and one school is taken for study from each zone) 200-250 preformed questionnaire is distributed in each school to students from 5-15 years of age. Questionnaire were distributed to the children, which were to be filled by their parents and collected later on after 2-3 days. A video had been shown and demonstration also done before doing PEFR with the help of breathe-o-meter peak flow meter and collected data has been analysed in respect to different demographic & scientific factors and their interpretation has been done by different statistical scientific method.

### Data Analysis:

The collected data were tabulated and analysed by using the statistical package SPSS (Statistical Package for Social Sciences) version 20.0 for Windows. The findings were described in terms of proportions and their 95% confidence intervals. Univariate analysis was carried out separately for each factor (question). Chi square tests of significance were carried out to test the differences between proportions. To determine the independent effect of various factors on bronchial asthma, Multiple Logistic Regression analysis was performed and their significance was estimated in terms of adjusted Odds Ratio and its 95% confidence interval. Significance was reported at 5% level.

### RESULTS:

**Table 1- Age Wise Prevalence Of Difficulty In Breathing Among Children**

Age (yrs)	Number of children screened	Prevalence of difficulty in breathing
5-8 yrs	276	46 (16.66%)
8-11 yrs	422	62 (14.69%)
11-15 yrs	302	41 (13.57%)
Total	1000	149 (14.9%)
Chi Square Value	1.11	
Significance 'p' Value	0.574 (NS)	

**Table 2- Gender Wise Prevalence Of Difficulty In Breathing Among Children**

Gender	Number of children screened	Prevalence
Male	538	95(17.65%)
Female	462	54(11.68%)
Total	1000	149(14.9%)
Chi Square Value	6.99	
Significance 'p' Value	0.008(S)	

**Table 3- Prevalence According To Risk Factors**

RISK FACTOR(n=149)	VALUE(%)	P value
Family history		0.576
Yes	24(16.07)	
No	125(83.89)	
Exposure to parental smoking		0.637
Yes	23(15.53)	
No	126(84.56)	
Exposure to kitchen smoke(use of wood, coal etc for cooking)		0.976
Yes	22(14.76)	
No	127(85.23)	
In-house pets		0.277
Yes	25(16.72)	
No	124(83.22)	
Use of soft toys/carpet/heavy curtains		0.112
Yes	29(19.46)	
No	120(80.53)	
Seasonal exaggeration		0.180
Yes	27(18.12)	
No	122(81.87)	

## DISCUSSION

Asthma is regularly viewed as a solitary disease substance but the fact is contrary to this as asthma is a heterogeneous disorder portrayed by ceaseless aviation route irritation, bronchial hyper responsiveness and variable wind current hindrance. Basic manifestations are intermittent scenes of chest wheezing, windedness, chest snugness and hacking, especially during the evening or in the early morning. Environmental factors, including increasing exposure to pollution, allergies, environmental tobacco smoke and sedentary life style have been identified as risk factors for asthma.

Present study was conducted to find out undiagnosed pediatrics asthma prevalence in 5 to 15 years of age group among school going children in both government and private schools in Bhopal city. There were 149 students out of the total who answered "yes" to any of the above criteria based questions. Thus, the prevalence of questionnaire diagnosed asthma came out to be 149(14.9%). Out of these 138 (92.6%) were newly detected asthmatics by the study questionnaire, excluding those already diagnosed by the physician 11(7.4%). Out of the total asthmatics 142 (14.2%) children reported wheezing and/or whistling in past 12 months and 29 (2.9%) children used medication for wheezing and/or whistling in past 12 months.

The prevalence of asthma in the study is higher than that observed by Jain et al and others.[5-9] In some other studies the overall prevalence was 18% for symptoms suggestive of asthma and 5% for diagnosed childhood asthma among children of 0 – 12 yr age at Chennai and 16.6% in urban and 5.7% in rural areas of Bangalore.[10-11] The low level of prevalence found in National Family Health Survey-3 (2005-06) may be because of the lesser sensitivity of the questionnaire and self-reporting or lack of uniformity in the data collection process.

The gender distribution in our study is consistent with the other

studies.[5,7,12] The study of Schenker MB et al observed a higher M:F ratio.[13] Though there was no gender difference observed in these studies, they had followed a different methodology and the later was carried out a long time ago. The male predominance may be related to a greater degree of bronchial lability in males.[14] In a recent study, female preponderance was found which was attributed to the fact that living in ill-ventilated houses, use of cow-dung cakes and agriculture waste as fuel for cooking and girls always helping the mothers to cook in the kitchen lead to airway inflammation and asthma[15]

The inverse linear relationship between bronchial asthma and age that we report is a known phenomenon.[5,16] This finding can be explained by the ongoing maturity of the immune system and desensitisation of bronchial mucosa with age.

In contrast to our results, several studies have reported a strong association between family history of atopic disorders and the prevalence of current asthma.[16,17] Animesh et al has reported well documented strong association of family history with prevalence of asthma in children which differs with the results so obtained in our study.[5]

Indoor air pollution due to biomass or solid fuel combustion is an important risk factor in the Indian setting, but in our study, we haven't found any significant association with the exposure of children to parental smoking and the type of fuel used in the kitchen.[14] Our study has shown that the proportion of cases was significantly less among those who live in houses with smoke outlets. Exposure to passive tobacco smoke was shown to be an important risk factor in our study, similar to that in other studies, but it was statistically not significant.[16] Our study was also unable to obtain any significant association with the in-house pets, use of soft toys/carpet/heavy curtains. Similar results were obtained by many other researchers in the various parts of the world.[11-16,19]

Our study has certain limitations. Since the questionnaire were distributed to the children in the school and collected from them after 2 days, there was no direct interaction with the parents. Hence, there may have been respondent or reporting biases due to incorrectly reported symptoms. Further studies are warranted to explore the risk factors of bronchial asthma among children in different geographical regions.

## CONCLUSION:

The results of our study highlight that there is a high prevalence of undiagnosed bronchial asthma among school going children. Higher prevalence in school age group leads to serious implications for adults later in life. More studies are required to consolidate these results and the factors associated with the same in different regions of the country.

## REFERENCES:

- Riekert KA, Butz AM, Eggleston PA, Huss K, Winkelstein M, Rand CS. Caregiver-physician medication concordance and undertreatment of asthma among inner-city children. *Pediatrics* 2003; 111:e214-e220
- Von Mutius E. The burden of childhood asthma. *Arch Dis Child* 2000; 82: (Suppl 2): II2-5.
4. Lenney W, Wells NEJ, O'Neill BA. The burden of pediatric asthma. *Eur Resp Rev* 1994; 4: 49-62.
- Singh D, Sobti PC, Arora V, Soni RK. Epidemiological study of Asthma in Rural Children. *Indian J Community Med* 2002; 27:167-170.
- Jain A, Bhat V, Acharya D. Prevalence of Bronchial Asthma in Rural Indian Children: A Cross Sectional Study from South India. *Indian J Pediatr* 2010; 77 (1): 31-35
- Hill RA, Standen PJ, Tattersfield AE. Asthma, wheezing, and school absence in primary schools. *Arch Dis Child* 1989; 64:246-251.
- Chhabra SK, Gupta CK, Chhabra P, Rajpal S. Risk factors for development of bronchial asthma in children in Delhi. *Ann Allergy Asthma Immunol* 1999; 83: 385-390.
- Anderson HR, Bailey PA, Cooper JS, Palmer JC, West S. Morbidity and school absence caused by asthma and wheezing illness. *Arch Dis Child* 1983; 58: 777-784.
- Somashekhar AR, Paramesh H. Prevalence of under-diagnosed asthma in

- adolescents. In Proceedings of the XXXIX National Conference of the Indian Academy of Paediatrics, Bangalore 2002.
10. Chakravarthy S, Singh RB, Swaminathan S, Venkatesan P Prevalence of asthma in urban and rural children in Tamil Nadu. *Natl Med J India* 2002; 15:260-263.
11. Paramesh H. Epidemiology of asthma in India. *Indian J Pediatr* 2002; 69:309-312.
12. Kumar L, Singh M. Respiratory Allergy. *Indian J Pediatr* 2002; 69: 237-244.
13. Schenker MB, Samet JM, Speizer FE. Risk factors for childhood respiratory disease: The effect of host factors and home environmental exposures. *Am Rev Respir Dis* 1983; 128: 1038 – 1043.
14. Verity CM, Vanheule B, Carswell F, Hughes AO. Bronchial lability and skin reactivity in siblings of asthmatic children. *Arch Dis Child* 1984; 59: 871-876.
15. Paramesh H. Epidemiology of asthma in India. *Indian J Pediatr* 2002; 69:309-312.
16. Saraclar Y, Sekerel BE, Kalayci O et al. Prevalence of asthma symptoms in school children in Ankara, Turkey. *Respir Med* 1998; 92: 203-207
17. Karunaeskara KA, Jayasinghe JA, Alwis LW. Risk factors of childhood asthma: A Sri Lankan Study. *J Trop Pediatr* 2001; 47: 142 - 145.
18. Ratageri VH, Kabra SK, Dwivedi SN, Seth V. Factors associated with severe asthma. *Indian Pediatr* 2000; 37:1072-1082.
19. Hijazi N, Abalkhail B, Seaton A. Asthma and respiratory symptoms in urban and rural Saudi Arabia. *Eur Respir J* 1998; 12: 41-44.