Original Article

Socioeconomic Risk Factors for Asthma in Child

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ABSTRACT

Aim and Objective: The purpose of the study was to explore and explain different socioeconomic conditions and factors related to childhood asthma.

Design of Study: Cross sectional descriptive study.

Place and Duration of Study: This study was conducted at the Children's Hospital & the Institute of Child Health, Lahore for a period of three month.

Patients and Methods: This is a descriptive study done at the asthma clinic of the Children's Hospital & the Institute of Child Health, Lahore. Total 110 patients were included in the study between 2-16 years. An objectively designed structured questionnaire was used and data was collected after taking consent from the parents.

Results: Out of 110 patients, the commonest age was 2-8 years for both males and females. The disease was most common in boys (63.6%) and urban area (57.3%) had higher frequency than patients from semi urban (24.5%) or rural areas (18.2%). Asthma was more common in lower and middle class than upper. Different socioeconomic risk factors involved in the increased frequency of asthma were smoking, animals at home and environmental dust. Allergic reactions to food, change in weather and preceding upper respiratory tract infections also play an important role.

Conclusion: Poor socioeconomic class, uneducated families, urban life and environmental allergen exposure are responsible for increase frequency of asthma and by investing resources in to community based education and support services we can provide a better control of asthma to our community.

Key Words: Socioeconomic status, tobacco smoke, allergens

INTRODUCTION

Asthma is a common chronic disease causing considerable morbidity. Asthma is a problem worldwide, with an estimated 300 million affected individuals. It appears that the global prevalence of asthma ranges from 1% to 18% of the population in different countries (1). The world health organization has estimated that 15 million disability-adjusted life years (DALYs) are lost annually due to asthma, representing 1 % of the global disease burden (2). Asthma prevalence and severity is increasing in many developing countries, the changing pattern of the disease has not been fully studied but it is well documented that the prevalence changes with the environmental exposure especially geographical variations(3). Socioeconomic conditions are associated with asthma occurrence, its severity and hospitalization. Living in underprivileged area is a strong independent predictor of hospital admission for asthma. Several studies from North America have indicated an indirect association between socioeconomic status and asthma prevalence, but in other parts of the world, Europe included the association is not so clear. Socioeconomic status may contribute as an etiological factor per se or as a surrogate of environmental risk factors (e.g. passive smoking, indoor mould and dampness), as a component in diagnosis and in labeling the conditions, as a factor in the exacerbation of the disease as a determinant of the quality of care that parents receive (4). The epidemiology of childhood asthma and allergies is of considerable interest and importance because of the increasing economic impact on the health services and possible increase in its prevalence and severity in some Asian countries. Factors responsible for causing asthma or precipitating attacks are still poorly defined, and changes in life style and environment that are associated with urbanization and development may be partly responsible for the increase in both prevalence and severity (5). Socioeconomic status is a multi dimensional concept and no single measure can fully account for person's SES. It is advisable to use multiple SES indicators for understanding its possible effects on health (6). Socioeconomic status refers to family's position within a community and can be defined in terms of prestige (e.g. parent's education or occupation) as well as resources e.g. family income or assets (7). Other factors which are included in the SES are area of living (rural/urban, number of rooms in the house, atmosphere

ventilation, exposure to daily smoking and seasonal effects). The study was designed to determine the different socioeconomic risk factors associated with childhood asthma. The purpose of the study was to explore and explain different socioeconomic conditions and factors related to childhood asthma.

PATIENTS AND METHODS

This is a crossectional descriptive study conducted at the asthma clinic of the children's hospital and the institute of child health, Lahore. Our study population consisted of 110 children aged 2 to 16 years with diagnosed asthma over a period of 3 months.

Asthma was defined clinically. Its severity was classified on the basis of day and night symptoms commonly reported as asthma symptoms (cough, wheeze, limitation of daily activity and nocturnal cough etc) in literature. All patients with mild, moderate and severe persistent asthma were included in the study. Mild intermittent cases were not included. For data collection an objectively designed questionnaire was filled for each patient. Every mother was interviewed after taking the consent she was asked whether the child was suffering from bronchial asthma at present, or had done so previously, and whether the diagnosis had been confirmed by the doctor. The questionnaire also included some socioeconomic variables like parental education, occupation, overcrowding (which we defined as no. of people per room, excluding baths and kitchens), social class (monthly income of family), exposure to daily smoking or the maternal exposure during pregnancy. Other potential confounding factors were area of living (urban, semi urban, rural), allergic reaction to food, exposure to animals, dust, weather change, upper respiratory tract infections or use of antibiotics in the last 3 months.

Parental education in this study was divided in to 4 levels; 1) illiterates, 2) below matric, 3) matric and 4) graduate. Father's occupation was also divided into 4 categories; 1) unemployed, 2) professional workers/ employed, 3) businessman, 4) laborer/ unskilled worker, while mothers were grouped as house wives and working women. Social class of the study population was determined according to the family's income per month. 10,000 poor, 10-20,000 lower middle, 20-40,000 upper middle and >40,000 upper class.

RESULTS

Of the total 110 patients enrolled in the study 67% of the children were between 2 to 8 years of age. (Fig- 1), about 36% were females and 64% were males. (Fig- 2). The disease was most common in urban area 63 (57.3%) than patient from rural area 20(18%) and semi urban 27(24.5%) as shown in Fig- 3.

Asthma was more common in middle and lower socioeconomic class (48.2% and 44.5% respectively) than the upper socioeconomic class (only 7.3%). The distribution of parental educational level and occupation is shown in table- 1. Overall asthma was more prevalent 54.6% with father's educational status below matric while 45.4% were above matric. Same is true for relationship of asthma with maternal education i.e. 60% mothers were below matric (table- I).

Asthma was noted in 4.5% of the unemployed fathers while it was 60% in the professional workers/ employees, 19.1% parents belonged to businessman or skilled manual worker class while 16% were unskilled manual workers or laborers. Regarding patient's mothers 97(88.2%) were housewives whereas, 13(11.8%) were working mothers.

Figure No.1: Age Groups n=110

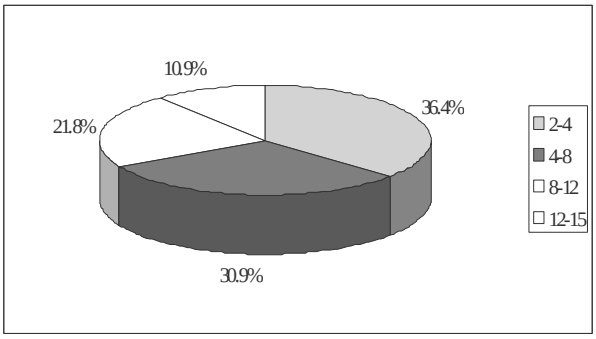


Figure No.2: Sex Distribution n=110

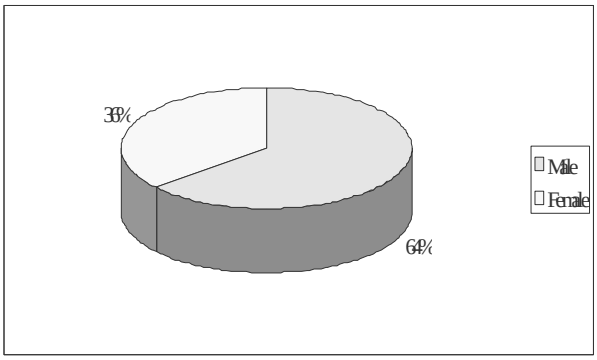
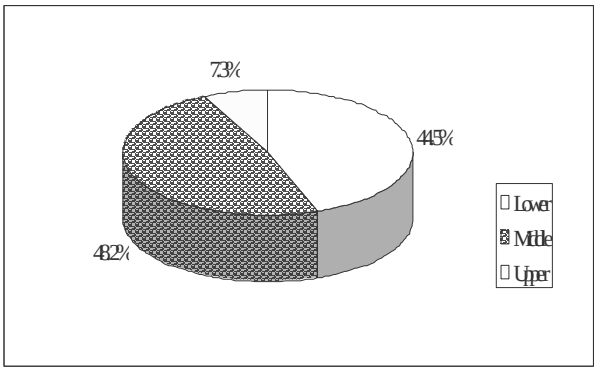


Figure No.3: Socioeconomic Status n=110



The various environment factors considered as risk for asthma are shown in table- 2. Frequency of asthma was highest in families with 7-8 persons living in single room 71(64.5%). Exposure to daily indoor smoking was present in 40 (36.4%) children, maternal cigarette

smoking during or after pregnancy was present in 44(40%) patients (table 2). Other variables which affect the asthma frequency in children were allergic reactions to food in 84 (76.4%), exposure to animals in 36.4%, to dust in 81.8%. Asthma was found to be more prevalent in winter 50% when compared with spring / autumn 41%, summer 8.2%. The relationship with the preceding upper respiratory tract infections and use of antibiotics in last 3 months was found to be significant (76.4% and 80.9 %) according to frequency (table- 2).

Figure No.4: Area of Residence n=110

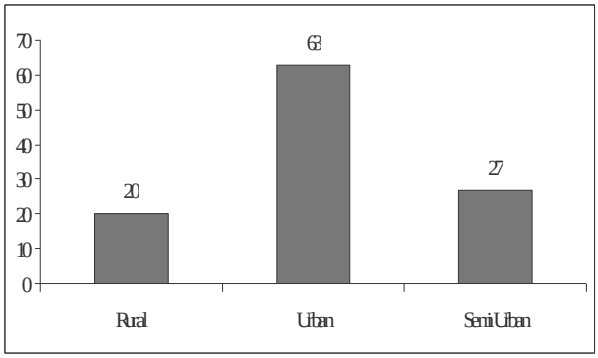


Table No. 1: Association between asthma prevalence & indicators of socio-economic status among children
n=110

Factors	Frequency	Percentage
Father's Education		
Illiterate	32	29.1%
Below Matric	28	25.5%
Matric	34	30.9%
Graduate	16	14.5%
Mother's Education		
Illiterate	48	43.6%
Below Matric	18	16.4%
Matric	28	25.5%
Graduate	16	14.5%
Father's Occupation		
Unemployed	5	4.5%
Professional worker/employed	66	60.0%
Business	21	19.1
Laborer/unskilled worker	18	16.4%
Mother's Occupation		
House Wife	97	88.2%
Working women	13	11.8%

DISCUSSION

Social factors have long been suggested to contribute in childhood asthma. There are number of published studies on childhood asthma and socioeconomic status. This study shows that asthma was most common in age group 2-8 years in both males and females. While study done by Glushkova et.al showed the common age group was 5-9 years (8) and another study done by Mustafa et al showed more prevalence in 7-11 years old children. The gender analysis showed susceptibility for boys which is in comparison with other studies [3,4,5,8-10].

Table No. 2: Environmental factors effecting the childhood asthma
n=110

Factors	Frequency	Percentage
Crowding index		
7 – 8	71	64.5%
5 – 6	30	27.3%
3 – 4	7	6.4%
1 – 2	2	1.8%
Daily Smoking		
No	70	63.6%
Yes	40	36.4%
Smoking Exposure During Pregnancy		
No	66	60%
Yes	44	40%
Allergic reaction of Food		
No	26	23.6%
Yes	84	76.4%
Animal Exposure (Pets, cockroach)		
No	40	36.4%
Yes	70	63.6%
Dust Exposure		
No	20	18.2%
Yes	90	81.8%
Weather Change		
Summer	9	8.2%
Winter	55	50.0%
Spring & Autumn	46	41.8%
Preceding upper respiratory tract Infection		
No	26	23.6%
Yes	84	76.4%
Use of antibiotic in last three months		
No	21	19.1%
Yes	89	80.9%

In our study asthma was most common in urban area as compare to semi urban or rural areas which is also in comparison with the study done by Aligne et.al. (9). The increased incidence of asthma in urban settings may be due to several factors like more awareness and parental education who seek early medical attention and also more exposure to environmental allergens. Another study reveal urbanization and socioeconomic status had little impact on the prevalence of wheezing or asthma, but might influence the management of asthma (5).

Across all the social factors, socioeconomic status exhibits the most robust and consistent association with physical health outcome. Individuals from lower socioeconomic status families have poor health than from higher socioeconomic status families (4, 7). There is a possible role of poverty as a contributor in the etiology of asthma, independent from a known risk factor like parental smoking (4). As suggested, low social class may be an indicator of several factors relevant in asthma etiology like poor indoor air quality, dampness and mould, allergens, exposure to outdoor air pollution (4). The current study also shows increase risk of asthma in middle and lower socioeconomic class, which is comparable with other studies (10, 11). As living in an area with few social health services could be determinant of poor disease management (4). While a study performed in Italy found that urbanization and socioeconomic status had little impact on the prevalence of wheezing or asthma, but might influence the management of asthma (12). The individual indicators of socioeconomic status are parental education and occupation. The finding that parental education is the strongest predictive indicator in particular father's rather than mother's educational level, suggest that individual indicators are better able to detect socioeconomic differences than geographical ones (4,5), like in our study more than 50 % were under matric, similar is noted in study done by Lind back et.al (10). As far as father's occupation is concerned in our study asthma was more frequent in the children of professional worker and businessman as compare to unskilled and unemployed. It may be due to the poor availability of the health facility to this group or due to health awareness of the professional and businessman group. Asthma was noted more in the children of housewives/unemployed than in the working women, similar is also noted by Glushkova et.al (8). While positive association between social advantages and asthma were reported in U.K, Hermann et.al observed the opposite in Denmark. Unemployed, low educated mother could be more likely to live in suboptimal living conditions with dampness, mould or cockroaches which are in turn associated with asthma in children (8). The rapid rise in childhood asthma suggests a role for environmental exposure in the etiology of this evolving epidemic (14). One of the environmental factors is overcrowding, when we assess asthma with the crowding index, we found it to be directly related with the disease as is also noted by Lind back et al (10). While in another study done by Camilla et al, overcrowding emerged as consistently associated with less asthma symptoms (6). This association would support the hygiene hypothesis (The hygiene hypothesis proposes that the development of allergy and asthma can be prevented by a shift from T-helper type 2 cells to T-helper type 1 cells, which can be induced by exposure to immune stimulants such as viruses, bacteria and endotoxins, during the prenatal period or early childhood.) (6,16). Another important environmental factor is exposure to tobacco smoke also including smoking during pregnancy. Maternal smoking has been most strongly associated with the adverse respiratory effect in children, suggesting that fetal exposure to maternal smoking may have important long term effects on children's respiratory health (13, 14, 15). As in our study association of maternal smoking is present with increased frequency of asthma. Moreover, in utero and postnatal exposure to maternal smoking increases the life time wheezing and persistent wheezing (13). It is evident that in utero exposure adversely affects postnatal lung function and increases the occurrence of asthma (17). We found an increased frequency of asthma in children having; allergic reaction to food (18); allergen exposure (sensitization and exposure to pets, cockroaches, house dust mite) (8,20); seasonal variation also have some relation with increase frequency of asthma as noted in our study that asthma is more common in winter and spring as compare to summer; upper respiratory tract infections or use of antibiotics in the preceding months also is directly related to increase frequency of asthma, similar was observed in another study (19).

CONCLUSION

This study has identified potentially modifiable risk factors like poor socioeconomic class, uneducated families, urban life and environmental allergen exposure, which are responsible for increase frequency of asthma. By investing resources in community based education and support services we can provide a better control of asthma to our community.

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