

## Risk Factors of Bronchial Asthma in Children ... A Hospital Based Study.

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### ABSTRACT:

#### BACKGROUND :

Asthma is characterized by inflammation of the airways with intermittent bronchospasm. Bronchial asthma is an important cause of morbidity and mortality in childhood. There are many identifiable risk factors contributing to both the expression and persistence of asthma .

#### OBJECTIVE:

This study threw a light on some of the risk factors of bronchial asthma in childhood.

#### PATIENTS AND METHODS:

This study was performed to determine some of the risk factors of childhood asthma in 62 asthmatic children admitted to Children Welfare Teaching Hospital in Baghdad Medical City in the period from 1<sup>st</sup> February to 1<sup>st</sup> July 2007 . The control group was composed of 108 age and sex matched children attending the outpatient clinic with non pulmonary health problems .

#### RESULTS :

Forty two ( 67.7%) asthmatic children were males and 20(32.2%) were females with a male to female ratio of 2.1:1 . Fifty two(83.8%) suffered from bronchial asthma before the age of 3 years , While 10(16.2%) acquired the disease after this age . A positive family history of asthma was positive in 31(50%) asthmatic children compared to 9 (8.33%) in the control group , scoring a highly significant association. A positive family history of allergic rhinitis (27.41%) in asthmatic children was more often recorded than in the control group (21.29%) but the difference was not statistically significant . A highly significant association between a positive history of smoking at home environment and childhood bronchial asthma was detected , where it was found positive in 50(80.6%)asthmatic children and in 55(50.9%) controls . A low crowding index (  $\leq 3$  persons /room) was recorded in 52 (83.9%)asthmatics compared to 72 (66.6%) controls , Scoring a significant association between low home density and childhood bronchial asthma.

#### CONCLUSION:

The present study concludes certain risk factors being associated with asthma namely positive family history of asthma , passive smoking and low crowding index. The study recommends avoidance of smoking at home where a child with a positive history of these risk factors resides .

**KEYWORDS:** risk factors, asthma ,children , cwth.

### INTRODUCTION:

Asthma is characterized by inflammation of the airways with intermittent bronchospasm. Bronchospasm is caused by the inflammation of the muscles surrounding the air passageways<sup>(1)</sup>. The major identifiable risk factors contributing to both the expression and persistence of asthma are:

Family history of atopy :

Family history of atopy is the most important clearly defined risk factor for atopy in children . Asthma is linked to both parental and sibling atopy . The

strongest association is with maternal atopy . A maternal history of asthma and/ or rhinitis is a significant risk factor for late childhood onset asthma and recurrent wheezing throughout childhood.

Effect of sex :

male sex is a risk factor for asthma in prepubertal children and female sex is a risk factor for persistence of asthma in the transition from childhood to adulthood .

Bronchiolitis in infancy :

viral associated wheeze in infancy is often followed by wheeze in early childhood<sup>(2)</sup>.

Parental smoking :

Maternal smoking is associated with significantly higher prevalence of wheezing illness in early

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childhood . Inhalation of cigarette smoke during pregnancy has been linked with abnormal lung functions , airway hyper-reactivity and allergy in the newborn<sup>(3)</sup>.

Birth weight and prematurity :

Wheezing is more common in young children who were born prematurely.

Age at presentation :

The natural history of wheeze is dependent on the age at first presentation. The earlier the onset of wheeze is, the better the prognosis . Studies show a break point at two years with the majority of those presenting before this age becoming asymptomatic by mid childhood (6-11year)<sup>(2)</sup>.

About 40% of asthmatic preschool children are atopic while 90% of late asthmatics are atopic.

Breast-feeding and wheezing illness:

It protects children from transient early wheezing presumably by protecting against viral infection, But appears to increase the risk of asthma in children over 6 years, But only if the children are atopic and their mothers asthmatics<sup>(4)</sup>.

Hygiene hypothesis :

Repeated viral infections other than lower respiratory tract infections early in life may stimulate the immature immune system towards the Th1 phenotype, Thereby reducing the risk for the development of asthma up to school age<sup>(5)</sup>.

Rural children :

Rural dwelling children seem to have much less asthma than urban dwelling children. Perhaps there is reduced atopy in farming families but there are other explanations such as greater exposure to bacterial infection or differences in diet and intestinal microflora in farming population.

Antibiotics and intestinal flora :

The life time prevalence of asthma is increased four times in children who have had antibiotics in the first year of life and this is related to the number of courses<sup>(4)</sup>.

Obesity :

In both adults and children, The incidence of obesity and asthma has been increasing in parallel over recent years. Studies report a strong association between the two conditions<sup>(3,6)</sup>.

Parental migraines and childhood asthma:

Some studies have reported a link between childhood asthma and parental migraines<sup>(3)</sup>.

### **PATIENTS AND METHODS :**

This study was performed to determine some of the risk factors of childhood asthma in 62 asthmatic Iraqi children admitted to Children Welfare Teaching Hospital (CWTH)in Baghdad Medical City in the period from 1<sup>st</sup> februray to 1<sup>st</sup> july 2007.

The control group composed of 108 age and sex matched children attending the outpatient clinic with health problems other than pulmonary diseases.

age, sex, residence ,Crowding index and presence of a smoker in the family were recorded . Risk factors like the presence of positive family history of asthma, Family and personal history of atopy in the form of allergic rhinitis or eczema were also inquired for in both groups.

Statistical analysis was done by the use of Chi square test and a P value less than 0.05 was considered significant .

### **RESULTS:**

Forty two (67.7%) of asthmatic children were males and 20(32.2%) were females with a male to female ratio of 2.1:1.

Fifty two (83.8%) suffered from bronchial asthma before the age of 3 years, While 10(16.2%)acquired the disease after this age .

A positive family history of asthma was positive in 31(50%) of asthmatic children compared to 9 (8.33%) in the control group , Scoring a highly significant association (P:0.0001; OR :11).

A positive family history of allergic rhinitis (27.41%) in asthmatic children was more often recorded than control group (21.29%) but the difference was not significant statistically .P:0.5 (OR: 1.4).

Variables including positive family history of eczema (8.06%) and personal history of atopy (4.83%) were less often recorded in asthma group than in control group where the percentages were 10.18 % and 10% respectively.

The percentages of urban residence were almost equal in asthmatics and controls.

A highly significant association (P:0.0001; OR:4) between a positive history of smoking a home environment and childhood bronchial asthma was detected, Where it was found positive in 50(80.6%) asthmatic children and 55(50.9%) controls.

A low crowding index ( $\leq 3$  persons/ room) was recorded in 52 ( 83.9%) asthmatics compared to 72 (66.6%) controls, Scoring a significant association (P. 0.02; OR: 2.6) between low home density and childhood bronchial asthma .

**Table 1 : The association of childhood bronchial asthma with some risk factors in 62 children admitted to CWTB in 2007.**

Risk factor		Asthmatic group No. (%)	Control group No. (%)	P value	OR
F.Hx. of asthma	Positive	31 (50%)	9 (8.33%)	0.0001	11
	Negative	31 (50%)	99 (91.66%)		
F.Hx. of allergic rhinitis	Positive	17 (27.41%)	23 (21.29%)	0.5	1.4
	Negative	45 (72.58%)	85 (78.7%)		
F.Hx. of eczema	Positive	5 (8.06%)	11 (10.18%)	0.8	0.8
	Negative	57 (91.93%)	97 (89.8%)		
Personal Hx. Of atopy	Positive	3 (4.83%)	11 (10%)	0.26	0.5
	Negative	59 (95.1%)	97 (89.8%)		
Family smoking member	Present	50 (80.6%)	55 (50.9%)	0.0001	4
	Absent	12 (19.3%)	53 (49.07%)		
Crowding index	Low	52 (83.9%)	72 (66.6%)	0.01	2.6
	Height	10 (16.12%)	36 (33.3%)		
residence	Urban	74 (75.8%)	82 (75.9%)	1.0	1.0
	Rural	15 (24.2%)	26 (24.1%)		

**DISCUSSION :**

Bronchial asthma is an important cause of morbidity and mortality in childhood . This study threw a light on some of the risk factors of bronchial asthma in childhood . The study shows that childhood bronchial asthma is more than twice more common in males (67.6%) than females. This result is compatible with another study done by Aws H in Mousl in 2005 where it was found that males formed 70.84% of asthmatic children <sup>(3)</sup>. A similar result was reported by kalyoncu A et al in 1999 <sup>(8)</sup>.

Symptoms of bronchial asthma started before 3 years of age in 83.84% and this is in agreement with Jinan s study in Baghdad in 2001 when she found that > 50% of asthmatic patients presented within first 2 years of life <sup>(9)</sup>.

This study shows that asthma is the most important atopic disease in the family associated with childhood asthma as it's presented in 50% of family members of asthmatic patients. The present study doesn't show an association between childhood asthma and allergic rhinitis in the family which is different from Saleem study <sup>(7)</sup>. This can be partially explained by the fact that almost 84% of asthmatic children in this study are younger than 3 years of age ( early onset asthma ) and about 40% of asthmatic preschool children are atopic while 90% of late asthmatics are atopic <sup>(4)</sup>.

It is known that asthma is linked to both parental and sibling atopy and the strongest association is with maternal atopy . A maternal history of asthma and /or rhinitis is significant risk factor for late childhood onset asthma and recurrent wheezing throughout childhood <sup>(5)</sup>. This study doesn't show association between childhood asthma and eczema in the family which is compatible with Saleem study , but not with others like Albsa F et al <sup>(10)</sup> . This controversy might

be related to the accuracy of diagnosis of atopic eczema and whether it's based on prospective follow up of patients or retrospective history taken from parents of asthmatic children .

The risk of being passive smokers due to the presence of one or more smoking members in the child residence among asthmatic children was 4 times higher compared with controls . This finding was higher than Qais M study in Baghdad 1999 who showed a significant association between asthma and passive smoking <sup>(11)</sup>. It is logical to think of cigarette smoke as irritant to the respiratory passages , provoking asthma in a genetically predisposed child. Reducing the prevalence of smoking in the adult population , and particularly in woman of childbearing age , would significantly reduce the prevalence of wheezing in young children <sup>(2)</sup>.

Our findings suggest that household crowding may protect against asthma . This result is consistent with the hygiene hypothesis which suggests that repeated viral infections other than lower respiratory tract infections early in life may stimulate the immature immune system towards the Th1 phenotype , thereby reducing the risk for the development of asthma up to school age<sup>(4,5)</sup>. In contrast other studies consider increasing apartment density as risk factor for asthma <sup>(7,12)</sup>.

The present study has not found and association between childhood asthma and other personal allergic disease as 4.8% had such a history as compared to the significant association shown by Saleem study <sup>(7)</sup>.This is more related to the accuracy of diagnosis of such conditions during prospective studies and lack of dependable medical record system of child health , Particularly during first year of life .

This study shows no association between residence whether rural or urban and development of asthma although most of asthmatic children were from urban residency but also most of the controls are so. Rural dwelling children seem to have much less asthma than urban dwelling children. Perhaps there is reduced atopy in farming families but there are other explanations such as greater exposure to bacterial infection or differences in diet and intestinal microflora in farming population<sup>(6)</sup>.

### CONCLUSION:

The present study concludes certain risk factors being associated with asthma namely positive family history of asthma, passive smoking. No significant association was found with positive family history of eczema, personal history of atopy and residence of the child's family. The study recommends avoidance of smoking in the houses, where a child with a positive family history of atopy and a dependable medical record system should be adopted for asthma patients which can be a part of an allergy and asthma clinic for better management and follow-up of children suffering from bronchial asthma.

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