A CLINICAL STUDY OF ASTHMA IN CHILDREN

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Tariq Iqbal Bhutta, Imran Iqbal (Department of Paediatrics, Nishtar Medical College, Multan.)

Abstract

Fifty children with bronchial asthma were studied. Male female ratio was 2:1 and age of onset was above 2 years in 70%. The disease presented as an acute attack in 74% cases. Commonest precipitating factors were exercise, cold air, cold drinks and rice. Symptoms were more prominent during the night and in winters in 56%. Chest deformity was noted in 24% and eosinophilia in 71%. PEFR was lower than 80% of predicted in 67%, spirometry showed obstructive pattern in all those tested. Disease was mild in 48%, moderate in 40% and severe in 12%. Severity of the disease was statistically unrelated to known risk factors. Expected weight of the patients was significantly affected by the severity of the disease but height remained unaffected (JPMA 38: 14 , 1988).

INTRODUCTION

In developing countries, asthma is probably the most common chronic respiratory illness after tuberculosis[1]. It is both underdiagnosed and undertreated[2]. Compared with other diseases, mortality due to asthma is low but morbidity is significant[3]. Recurrent or persistent course of the disease interferes with the daily life of all the asth¬matic children to a variable extent. Acute symptoms incapacitate the child for a time and chronic ones lead to growth retardation and beha¬viour problems. The presence of a chronically ill child puts social, physiological and financial burden on the parents, siblings, other family members and the community. Hence a study was done on children with bronchial asthma to find its presentation,severity in relation to risk factors and to evaluate its effects on body growth.

MATERIAL AND METHOD

Indoor and outdoor patients seen during 9 months (June 85 — Marcn 86) at paediatric department of Nishtar Medical College Hospital, Multan were included in the study. The criteria for selection was either a personal observation of an acute attack (with breathlessness, wheeze and ronchi on auscultation of chest), or history of such attacks with ronchi at examination. In doubtful cases, exercise testing was performed to elicit bronchial hyperreactivity. [4] Those suffering from some other disease were extluded. A detailed questionnaire was used to record history obtained from mothers in every case, information was also obtained from children wherever possible. Questions included age of onset, frequency, severity, duration of acute attacks, precipitating factors, degree of restriction of daily activities and family history of atopic disease. Complete physical examination was performed with particular attention to presence of any chest deformity. Height and weight of the patients were recorded. Routine investigations of blood and X-Ray chest were performed in most of the cases, during the quiscent phase. Peak expiratory flow rate (Wright's mini-flow meter: Airmed Corp.) was recorded in 33 patients who were able to cooperate in the manoeuvre. Lung function tests by a vitallograph were performed in eight patients when not in acute attack. Lability index[4] was calculated in four patients. Other investigations, like allergy skin testing and IGE levels could not be done because of lack of adequate facilities. Statistical analysis was done using analysed Student's 't' test and chi-square test.

RESULT

Fifty patients (34 males, 16 females) from different socio-economic group were studied. Ages of the patients ranged between 1½ years to 13 years; majority being above 5 years; ratio was 2.1 :l(Table-I).

TABLE I
Precipitating Factors.

Factor	No	Percentage
Dust	27	54
Pollen	12	24
Exercise	35	70
Cold air	35	70
Stress	22	44
Foods	34	68
Banana	3	
Fish	3	
Rice	21	
Cold Drinks	21	
Ice Cream	8	
Eggs	3	

Thirty six (72%) presented with acute episode of wheezing and four (8%) had history of wheezing at the time of admission. Nine (18%) had persistent cough or breathlessness and one was in status asthmaticus. In 15 (30%), asthma started before their second birthday and in 31 (62%) before their sixth birthday. Severity of acute attacks was graded into mild, moderate and severe on the basis of the treatment required to control it; namely, oral therapy, parenteral bronchochiators and hospita¬lisation. Afticks were mild in 26(52%), moderate in 19(38%) and severe in 5 (10%). The frequency of attacks was increasing since the onset in 19 (38%), decreasing in 2 (4%), while in 13(26%) it was unchanged. Common precipitating factors included cold air (70%), exercise (70%), dust (54%) and various foods (68%).Table I. In between the acute attacks, 2 1 (42%) had persistent cough and 5 (10%) had wheeze.

Asthma interfered with daily routine in 45 (90%); and in 35 (70%) exercise was difficult or impaired. An examination in quiscent phase revealed ronchi on auscultation in 17 (34%) and chest deformity in 12 (24%) (Table II).

TABLE II

Clinical Features in between acute Attacks.

History	No.	Percentage
Cough	21	42
Wheeze	5	10
Loss of sleep	7	14
Interference with daily routine	45	90
Difficulty with exercise	35	70
Examination	**No**	**Percentage**
Ronchi	17	34
Chest deformity	12	24
– Barrel chest	4	
– Pigeon chest	6	
– Flaring of costal margins	2	

The disease was more troublesome during the night and in winter in 28 (56%). Six patients (12%) had symptoms more prominent during summer. Maximum cases (54%) were admitted' in the three months of August, November and January. Twenty eight (56%) presented during winter months, and 22 (44%) during summer months (Table III).

TABLE III
Diurnal and Seasonal variation in Symptoms.

Symptoms	No	Percentage
Symptoms prominent at night	28	56
Symptoms prominent at day	–	–
Symptoms equal in day & night	22	44
Symptoms prominent in winter	28	56
Symptoms prominent in summer	6	12
Symptoms equal in summer & winter	16	32

Eosinophiia (more than 250 eosinophiia/ mm)3 was found in 71% patients. Chest roent¬genography revealed hilar prominence in 12%, increased bronchial markings in 94% and hyperin¬flation in 27%. Peak expiratory was less than 80% of Predicted in 22 (44%). All 8 showed decreased values of FVC; FEV1/FVC ratio, FMEF (forced mid-expiratory flow), PEF (peak expiratory flow) and MVV (maximum voluntary ventilation). Four patients tested for lability of airways by exercise testing were all found labile with a lability index of more than 30% (Table-V).

TABLE V

Lung Function Tests (%of Predicted).

Patient No.	Severity of Asthma	PEF	FVC	FEV_1	FEV_1/ FVC	FMEF	MVV
28	Mild	39	85	70	–14	84	70
29	Mild	86	80	72	– 7	32	72
21	Moderate	53	60	60	+ 1	58	60
2	Moderate	72	37	34	– 8	70	34
15	Moderate	30	45	51	+11	67	51
40	Moderate	34	63	58	– 6	41	58
1	Severe	64	71	57	–15	58	57
9	Severe	38	74	49	–27	17	49
LABILITY INDEX							
37	Mild	44%					
39	Mild	19%					
10	Moderate	46%					
31	Moderate	31%					

PEF	Peak Expiratory Flow
FVC	Forced Vital Capacity
FEV_1	Forced Expiratory Volume in first second
FMEF	Forced Mild-expiratory Flow
MVV	Maximum Voluntary Ventilation

Severity of the disease was graded into mild, moderate and severe on the basis of Ellis classification[5].

In 24 (48%), disease was mild, in 20 (40%) moderate and in 6 (12%) severe. Severity of the disease was not influenced by age of onset or a with more severe disease not significant (Table VI).

TABLE VI
Severity in relation to Risk Factors.

	SEVERITY		
Factor	Mild	Moderate	Severe
Age of onset*			
Less than 2 year	9	4	2
More than 2 year	15	16	4
Sex**			
Male	14	15	5
Female	10	5	1
Male to female ratio	1.4:1	3:1	5:1
History of atopy in patient or family***			
Present	21	17	6
Absent	3	3	–

* 0.5 P 0.1
** 0.5 P 0.1
*** P 0.5

Severe degree of asthma was associated with failure to gain weight (P <0.10) although height was history of atopy although male sex appears to be associated unaffected (P<0.1). Duration of symptoms was not related statistically to height and weight attained (Table VII).

TABLE VII

Height and Weight in relation to Severity and duration of Symptoms.

Severity	No.	Height*		Weight**	
		90%	90%	80%	80%
Mild	22	19	3	14	8
Moderate	18	15	3	7	11
Severe	6	4	2	1	5
Duration of symptoms	No	$90%	+90%	80%	80%
4 years	18	15	3	7	13
4 years	28	23	5	15	11
Total	46	38	8	22	24

* 0.5 P 0.1
** 0.1 P 0.05
$ P. 0.5
\+ 0.5 P 0.1

DISCUSSION

Much has been written about asthma in the world, however, few clinical studies have been done in Pakistan. Male to female distribution in the present study correlates with findings of others[5,6]. Age distribution at the time of presentation also correlates with other studies[7]. The disease was more common in upper socio-economic classes in one study although present findings correlate with those of Williams and Phelan[9]. , who describe it more common in lower socioeconomic groups. A significant

percentage of patients of asthma presented with chronic cough which has been recognised as an important symptom of airway hyper-reactivity[10]. The percentage of patients with an onset of disease in first year of life is lower than that in other studies[7,11,12] which might be due to uñderdiagnosis of the disease especially in early years[2]. The observed deterioration in the fre¬quency of acute attack is at variance with obser¬vation of others[5]. This may be explained on the basis of a hospital based study which contains more cases with severe, persistent disease. Out of various precipitating factors asso¬ciation of cold air and dust with asthma is well known[13,14]. In a significant proportion of patients (68%) various foods were blamed, most common being rice and cold drinks. Wilson[15] also found cola drinks as precipitating acute asthma in Asian children. The insignificant role of eggs in our circumstances also correlates with his studies. In between acute attacks, majority of children complained of difficulty in exercise which correlates with other studies[16]. The complaint of nocturnal symptoms by all the patients studied has been well-explained by He¬tzel. [17] Most of the patients had aggravation of their attacks in winter and inflow of patients was highest during August, November and January. In this region, cold dry winds in Winter precipitate asthma. The frequency of admissions in August. can be explained on the basis of increased humi¬dity due to monsoon rains[7]. The presence of history of atopic diseases in other family members and/or the patient him¬self correlates with the largely atopic nature of childhood asthma[3]. The presence of eosinophiia in 71% of patients correlates with the findings of others[7]. The presence of increased bronchovascular markings on X-Ray chest has been described by others[18]. Hyperinflation seen in 27% is a measure of deranged physiology as is shown by the lung function tests. These findings correlate with those of others[4]. More severe asthma has been correlated with early age of onset[19], a male sex[3] and history of atopy[12,20]. In the present study, these findings did not reach statistical significance due to the small sample size. Severe degree of asthma also leads to growth retardation[21]. The present study showed that the severity of the disease sig¬nificantly affected the weight but not the height.

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