Socioclinical profile of children with asthma in Al-Majmaah Health Province

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ABSTRACT

Objective: Although asthma in children constitutes a major health problem, there is a dearth of literature on different aspects of asthma in rapidly developing countries. This cross-sectional research aims to study the socioclinical profile of asthmatic children and the impact of asthma symptoms on their life style.

Methods: The sample of this study, drawn from pediatric clinics of a general hospital and primary health care centers during a period of six months, comprised of children under 13 years of age who met the operational diagnostic criteria for asthma. The data collected from multiple sources on a semistructured questionnaire was analyzed by using different statistical tests.

Results: The results showed that male children represented 69% of the sample and children under one year of age manifested significantly severe degree of asthma. The frequency of asthma symptoms decreased in most of the studied children with increasing age. Further, they have insignificant family history of asthma (48.5%) but a significant smoking at home in severely affected children (59%). Moreover, most of them (88%) were mainly characterized by a combination of asthmatic symptoms of variable severity that adversely affected their sleep pattern and significantly resulted in school absences and increased days stay in hospital.

Conclusions: The revealed socioclinical profile of studied children with asthma has adverse impact on certain components of their life style, which shows the need for re-activating relevant treatment modalities including health education and changing certain habits like parental smoking at home, which adversely affects asthma.

Keywords: Childhood asthma, socioclinical profile, impact, life style, prevention, optimal treatment.

Saudi Medical Journal 2000; Vol. 21 (9): 847-851

Asthma is a major public health problem and afflicts all age groups of people of both genders. It is now considered as the most common chronic childhood disease. Its reported prevalence is 3% to 30%, which is further rising.[1,2] This epidemiological trend could be attributed to multiple factors including public awareness and recognition, infections, environmental pollution and related changes, rapid urbanization, relevant health educational and promotional programs and others.[3-5] Like pneumothorax and intrabronchial foreign bodies, asthma in children could present as a lower airway respiratory emergency. In fact, acute asthma in children is a cause for a substantial increase in hospital admissions.[6] Moreover, it is associated with serious morbidity and mortality and, likewise, the worldwide cost of asthma care is very high, nearly six billion U.S. dollars.[7] However, the mortality from acute asthma, mostly its acute exacerbations, in children is low, i.e, 0.6 to 0.9 deaths per 100,000 population per year.[6] Majority of children with

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Received 12th February 2000. Accepted for publication in final form 7th June 2000.

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asthma die due to chronic under treatment and suboptimal management of acute episodes of asthma, a common problem reported from developing countries.[4,8] Therefore, the recognition of acute or subacute exacerbations of asthma that are characterized by progressive worsening of wheeze, chest tightness, and shortness of breath or some combination of these symptoms is of considerable clinical significance and indeed entails both immediate assessment of its severity and medical help. Additionally, most deaths from acute asthma occur prior to the person reaching a clinic or hospital. Therefore, again early recognition of triggering factors and deterioration in symptoms are essential in the management of asthma that should be started immediately at home. Hence, acute exacerbations with severe wheezing are among the most frequent reasons for children's visits to pediatricians.[9] This could be attributed to significant rises in the prevalence of wheezing[1,10] exercise induced peak flow variability,[11] and asthma diagnosis[12] as reported from several western countries.[13,14] Furthermore, there is a large body of researches documenting both wheeze and cough to be the most common symptoms of asthma manifesting during childhood and adolescence.[15-17] Beside characteristic sympto-matology of asthma in children, measurements of lung functions in particular decreased FEV_1 or peak expiratory flow are of further diagnostic value. The severity of acute episode of asthma could be determined by wheezing, use of sternocleidomastoid muscle in older children, spirometry, pulse oximetry and finally oxygen saturation. It is noted that among all, wheezing is the least sensitive indicator of airflow obstruction and response to therapy.[6]

In Arabian Gulf countries including Saudi Arabia, there is a relative dearth of relevant literature on asthma. However, a brief review of local studies[4,5,18-24] showed a further need to explore different aspects of bronchial asthma in children. The researchers collectively projected that the prevalence, i.e, 10% to 17%, of asthma among Saudi school children varies with the geographical distribution of this country. However, authors of this study feel that there could be some more reasons such as methodological differences, age and gender under consideration, ethnicity, climatic conditions, pollution, and parental smoking to explain these variations. The estimated prevalence rates are certainly higher than the figures from western countries, which are attributed to rapidly environmental and psychosocial changes in Saudi Arabia.[22,23]

In addition to these inconsistent results, meager relevant data, and, moreover, a greater international concern regarding mother and child health care, we carried out this study, which has the following goals, 1) to describe the sociodemographic variables, in particular age and sex, of children with asthma; 2) clinical profiles of these children and 3) the impact of symptoms on asthmatic children.

Methods. This is a cross-sectional study that was conducted during a 6-month period, ie., from February 1996 to July 1996, in Al-Majmaah region, Saudi Arabia. The population of Al-Majmaah health province is approximately 30,000. The sample included consecutively selected 606 children with asthma having age up to 13 years. The two sources for collecting samples were 10 randomly selected primary health care centers from a total of 20 health centers of Al-Majmaah province and pediatric clinics of Al-Majmaah General Hospital. The research team headed by first author (Al-Ghamdy) discussed multiple times with participants the techniques of collecting data, ie., questionnaire sheet, diagnostic protocol, and other relevant procedures in order to abstract information in a reliable manner.

Each child with asthma and a key relative who gave oral consent for participating in this study were interviewed in detail and the relevant data was noted on a semistructured questionnaire sheet that included sociodemographic data, past history of asthma, duration of symptoms and hospitalization, trigger factors, environmental and family histories like parental smoking, sleep interruptions, school absences, and restriction in day to day activities due to episodes of asthma. In addition, each child underwent comprehensive physical and systemic examinations and any abnormal finding was noted on the aforesaid sheet. The diagnosis of asthma was based on multiple sources and operational criteria, which included extensive review of medical records of old cases, history of previous visits to hospitals and use of medications for asthma, presence of one or more clinical symptoms such as chest tightness, wheezing, breathlessness and cough plus aided by peak expiratory flow measurements in old, as well as new clients (less than 50% of predicted). Moreover, children over 5 years had measurement of their peak

Table 1 - Distribution of respiratory symptoms according to age (n=606).

Age in years Group (N)	Dyspnea N (%)	Wheeze N (%)	Cough N (%)
-1	82 (88)	84 (90)	67 (72)
-3	150 (78.5)	174 (91)	136 (71)
-6	121 (78)	144 (93)	103 (66.5)
-13	121 (72.5)	150 (90)	115 (69)
x2	8.68	1.03	1.26
P value	<0.05	>0.05	>0.05

Table 2 - Severity of asthma according to age at first diagnosis.

Age in years	Mild N (%)	Moderate N (%)	Severe N (%)
<1	223 (47.5)	25 (37)	44 (63)
1-5	205 (44)	33 (49)	21 (30)
>5	41 (9)	9 (13)	5 (7)
χ^2=9.98, p<0.05, significant			

Table 3 - Severity of asthma and smoking at home.

Smoking	Mild N (%)	Moderate N (%)	Severe N (%)
Positive	190 (40.5)	37 (55)	41 (59)
Negative	279 (59.5)	30 (45)	29 (41)
χ^2=11.75, p<0.05, significant			

Table 4 - Impact of asthma symptoms on studied patients (n-606).

Impact	Severity of asthma			
	Mild N (%)	Moderate N (%)	Severe N (%)	p value
1. Interruption of sleep	304 (65)	49 (73)	56 (80)	χ^2=7.49, <0.05
2. Restriction of family activities	44 (9)	10 (15)	11 (16)	χ^2=3.94, >0.05
3. Absences from school				
1-3 weeks	8 (6)	6 (23)	9 (39)	χ^2=29.63, <0.001
>3 weeks	10 (7)	3 (11.5)	4 (17)	
4. Days spent in hospital/last year				
<5 days	47 (10)	7 (12)	8 (13)	χ^2=35.34, <0.001
5-9 days	43 (9)	14 (21)	15 (23)	
>9 days	10 (2)	5 (7.5)	7 (10)	

expiratory flow. The diseases other than asthma causing wheeze were excluded on clinical grounds. The severity of asthma, ie., mild, moderate and severe, was assessed according to the Saudi National protocol for the management of bronchial asthma.[23] The collected data was analyzed by using SPSS/W in V-6 statistical package and frequency distribution, chi square analysis and fishers exact test were used for statistical purpose. The later two tests were used for categorical variables. The p value of 0.05 or less was considered statistically significant.

Results. At sociodemographic level, this study showed that males constituted 69% (n=417) while 31% (n=189) were females. The male to female ratio was 2.2:1. The age distribution was as follows: 15% less than one year age, 31.5% from 1 up to less than 3 years, 26% from 3 to less than 6 years and 28% from 6-13 years. It is commented that the frequency of asthma decreased with increasing age among studied children.

At symptom level, about 88% of the children presented with a combination of symptoms, a modal presentation of asthma in children. Of these 51% presented with cough (69.5%), dyspnea (78%) and wheeze (91%). However, a small proportion of children (12%) manifested one symptom. As shown in Table 1, dyspnea was significantly higher among children below one year of age (χ^2=8.68, P=<0.05). The distribution of respiratory symptoms, i.e, dyspnea, wheeze and cough, among males and females were not statistically significant (χ^2=2.77, 0.07 & 1.99, p=>0.05).

At severity level, it was observed that majority of children (77%) were having mild degree of asthma while more or less equal number of children were having moderate (11%) to severe (11.5%) asthma. Furthermore, it was shown (Table 2) that 63% of children presented with severe symptoms of asthma before one year of age, and these differences were statistically significant (χ^2=9.98, P=<0.05). In addition, it was revealed that 48.5% of studied of children (n=294) gave positive family history of asthma. However, the severity of asthma was not significantly correlated with its family history (χ^2=1.88, P=<0.05). Table 3 showed the distribution of parental smoking in accordance with the severity of asthma among studied children. The severe grade of asthma among children was correlated with positive history of parental smoking (χ^2=11.75, P=<0.01).

Table 4 showed the impact of asthma symptoms on certain variables among studied children. The interruption of sleep (χ^2=7.49, P=<0.05) and so 1-3 weeks of absence from school (χ^2=29.63, P=<0.001) and days spent in hospital (χ^2=35.34, P=<0.001) were significantly associated with severe degree of asthma.

Discussion. This study investigated socio-demographic variables, symptomatology and finally the impact of various symptoms on children's life style. It was reported in community[14,25] and hospital[4] based studies that asthma, hay fever and probably other atopic diseases having etiologically common diathesis, eg., IgE mediated, have predilection towards male gender and this research found the similar trend among studied children. However, this sex-divergent finding disappears among adolescents and likewise unique respiratory symptoms of asthma do not discriminate significantly either gender. This finding should be interpreted cautiously because a larger sample from community could have confirmed or refuted robustly the sex related differences of asthma symptomatology.

It has been reported[26] that the incidence of asthma decreases with age, with the highest rates among infants less than one year and the lowest rates among adults. The researchers[25] also suggested that the children with mild disease are likely to become asymptomatic as teenagers whereas those with more severe disease will continue to have symptoms throughout life. The findings of this research partly substantiated these notions as frequency of asthma decreased in older children, though the percentage of children less than one year was inconsistently low. The later incongruous finding could be attributed to the methodological differences in particular the type of sampling sources, which is hospital-cum-primary health care centers based. Moreover, some of the true cases of asthma below one year of age might have been excluded due to diagnostic problems they posit. Like other studies[6] the present research revealed that majority of studied children presented with a combination of respiratory symptoms rather than a single symptom. However, dyspnea rather than wheeze and cough was the most common symptom in infants below one year of age and this trend needs further corroboration. Overall, like other studies[6,20] the core symptoms such as wheeze, chest tightness and cough in decreasing frequency were the most frequently reported manifestations in older children in this research. The most severe asthma was found in children below one year of age while mild and moderate degree of asthma in children above one year of age and this trend is more or less similar to other researches.[4] The implication of this important finding is that clinicians must give prompt and appropriate treatment to severely ill infants with asthma in order to improve their outcome.

Unlike other studies[22,27,28] this research did not find a significant association between the severity of asthma symptoms and family history of atopic disease. This finding could be interpreted in terms of environmental triggering exposures that, beside others, are the most important precipitating factors in the acute exacerbation of asthma. This might also reflect that environmental pollution is not a major problem in the concerned region. In a relateddevelopment, researchers[29,30] have reported that both current wheeze and cough were associated with the presence of smokers in the household. Likewise this study also found a robust relationship between smoking at home and severity of asthma symptoms in children. This finding has potential implications including the dangerous effects of smoking on the health of growing kids. Notably maternal rather than paternal smoking has been strongly linked to the development of asthma in children.[31] Although smoking is an important risk factor for bronchial hyperactivity - a feature of asthma - but its association with asthma may remain uncertain[25] and, hence, needs further relevant researches.

Like this research, other studies[6] have found many devastating effects of bronchial asthma on the life style and quality of life of children. Moreover, it is generally believed that the asthmatic children with frequent interruption of sleep, absences from school and overstay in hospitals may have adverse biopsychosocial consequences including educational failures, developmental disorders and a variety of psychological disorders.

In conclusion, despite some limitations, this study found that most of the children with increasing age having insignificant family history of asthma along with significant smoking at home were characterized by a combination of asthma symptoms of variable severity, all that affected adversely their sleep pattern and schooling and resulted in overstay in the hospital. This data adds to the growing literature that suggests that certain socioclinical factors characterize children with asthma that affect adversely their life style. In light of this research and other reviewed studies, future researches recruiting fairly a large number of children with asthma are needed, which should explore the parental and community attitudes' towards asthma,[32] its clinical characteristics, trigger factors, and treatment variables, which overall determine the long-term outcome of asthma in children.

Acknowledgments. The authors express thanks to all participating physicians both of PHC centers and General Hospital, Al-Majmaah Health Province who helped in carrying out this research.

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