THE IMPACT OF SOME DEMOGRAPHIC FACTORS ON THE SEVERITY OF ASTHMA IN CHILDREN

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هدف الدراسة : لبحث العلاقة بين عوامل التركيبة الوصفية المختلفة ودرجات حدة مرض الربو وتكراره يبن مجموعة من مرضى الربو في مستشفى جامعة الملك عبد العزيز .
طريقة الدراسة : تمت دراسة 125 مريضاً بالربو تتراوح أعمارهم بين 6 شهور إلى 15 سنة . تم توصيف حدة المرض طبقاً للإرشادات الاستراتيجية الدولية لتقييم ومعالجة مرض الربو . حللت المعطيات التركيبية الوصفية حسب السن والجنس حيث تم تقسيم سن الحضانة (1-3 سنوات) ، سن التمهيدي (3-6 سنوات) ، سن الدراسة (6-12 سنة) ثم سن البلوغ (12-15 سنة).
نتائج الدارسة : طغت نسبة المرضى الذكور 80 مريضاً (46%) في كل المجموعات ما عدا مرحلة سن الرضاعة. عشرة منهم (8%) في سن الرضاعة، 22 (6. 17%) في سن الحضانة، 26 (8. 20%) في سن التمهيدي ، 49 (2. 39%) في سن المدرسة ، 18 (4. 14%) مرض في سن البلوغ .
وقسمت الحالات حسب حدة المرض إلى 11 (8,8 %) حالة متقطعة، 74 (2. 59%) دائمة بسيطة ، 33 (4. 26%) دائمة متوسطة ، 7 (6. 5 %) حالات دائمة شديدة، ولوحظ أن حدة مرض الربو وتكراره أكثر في المرضى الذكور دون الإناث وفي حالة سن الدراسة مقارنة ببقية المجموعات الأخرى .
الخلاصة والتوصيات: لوحظ أن حدة مرض الربو وتكراره بين الذكور خاصة بين مجموعة سن الدراسة. ونظراً لترابط الحالة السريرية بالعوامل التركيبية الوصفية فمن الممكن أن يساعد ذلك الارتباط في توقع حدة المرض وهذا يستدعي الاهتمام اللازم وبذل عناية أكثر بهذه الفئة بصفة خاصة .

الكلمات المرجعية : حدة مرض الربو ، العمر / الجنس ، الربو الشعبي ، الربو الشعبي لدى الأطفال ، التركيبة الوصفية .

Objective: *To investigate the association between some demographic factors and the levels of severity among asthmatic children.*
Method*: One hundred and twenty five asthmatic children aged between 6 months and 15 years were studied in pediatric and asthma clinics at King AbdulAziz University Hospital (KAUH). The assessment of clinical severity was based on the global strategy guidelines for asthma assessment and management. Subjects were grouped by age: infants (≤1 year), toddlers (1-3 years), preschool or kindergarten (3-6 years), school (6-12 years), and adolescents (12-15 years). Demographic data (age and sex) were analyzed for any statistical significance.*
Results: *Boys were 80 (64%) and predominated in all age groups except in infants. 10(8%) were infants, 22(17.6%) toddlers, 26 (20.8%) preschool or kindergarten,*

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49 (39.2%) school, and 18 (14.4%) adolescent. The levels of severity of asthma were intermittent 11 (8.8%), mild persistent 74 (59.2%), moderate persistent 33 (26.4%), and severe persistent 7 (5.6%). Frequency and severity of asthma were significantly higher in boys than girls (P<0.05) and at school age compared to other age groups (P<0.05).

Conclusion & recommendation: *This study demonstrated an increase in the frequency and severity of bronchial asthma in boys, particularly, those at school age. As stated in the literature, correlating demographic factors and clinical status can help in the prediction of the severity of asthma and possibly its outcome. This demands greater vigilance in the care of this group of asthmatics more than any others.*

Key Words: *Asthma, asthma severity, asthma guidelines, gender, bronchial asthma, demographic data.*

INTRODUCTION

Asthma is considered the commonest chronic inflammatory condition of the respiratory system.[1-3] Currently, asthma is one of the illnesses with the highest rate of increase in mortality and morbidity.[2,4] Although, there may be a spontaneous recovery without therapeutic intervention, health researchers are still working hard on the epidemiology, diagnosis, assessment and management of this troublesome condition.[1,3,5]

Several factors have been documented as the cause of the aggravating symptoms. Demography, such as age and sex, are among the factors that may influence the symptoms and clinical severity of asthma.[5-8] Internationally, work by several authors has revealed that in some age groups boys are more severely and frequently affected than girls.[4,8,9] With increasing age, the prevalence of asthma continues to be higher in boys than girls, reaching a peak by mid-childhood.[5,8] The risk of developing asthma in boys younger than 10 years-old is almost double that in girls. By the age of 14, boys are four times more likely to develop chronic asthma and as likely to be hospitalized.[5,10,11] However, during and after adolescence, the predominance begins to decline. Indeed, post-puberty females are at slightly greater risk of developing asthma and up to three times more likely to be hospitalized.

Therefore, it is of paramount importance that the impact of different age groups and gender on the levels of severity of asthma be explained. Additionally, the predominant age/sex in each severity group needs to be taken into account. Recently, some of these findings have been suggested by local reports in Saudi Arabia.[6,7,12] The study of these factors will help in predicting the prognosis and possibly the overall management of this common illness. The recently revised global strategy for asthma management guideline report came out with a classification of the clinical severity according to the different age groups.[13] Hence, the conduct of this study was to investigate the association between some demographic factors and the level of asthma severity among asthmatic children seen at King Abdulaziz University Hospital (KAUH).

METHODS

All children presenting to pediatric and asthma clinic in (KAUH) during 1998-1999 with symptoms of chronic and/or recurrent

cough, recurrent shortness of breath and/or wheezy chest were sequentially selected. They were assessed clinically to establish the diagnosis of bronchial asthma based on the revised global strategy guidelines for asthma assessment and management.[13] Any doubtful cases or not confirmed asthma were excluded from the study.

Patients were divided into five age groups according to the recognized classification.[1,14] These groups were: infants (≤ year), toddlers (1-3 years), pre-school (3+-6 years), school age (6+-12 years) and adolescent group (12+-15 years). The Global Strategy for asthma assessment and management report was used to classify the clinical severity into intermittent, mild persistent, moderate persistent and severe persistent groups.[13]

To exclude diagnosis other than bronchial asthma, all subjects had stool analysis, complete blood count; some subjects had plain radiography of the chest. Few had other specific investigations such as barium studies, echocardiogram and sweat test.

Data was entered in a personal computer. Statistical analysis including frequency tables, correlation analysis and analysis of variance were performed using SPSS statistical package (version 7.5).

RESULTS

One hundred and twenty five asthmatic children, 80 of whom were males accounting for 64% of the study group as shown in Table 1, were included in the study. Except in the infants group, boys were significantly predominant in all age groups (P<0.05) (Figure 1).

The school age group showed the highest frequency of asthma, comprising 49 cases, which formed 39.2% of all cases. Out of all severity levels, mild-persistent type was the highest 74(59.2%). The frequencies of other severity types are shown in Table 2.

Asthma frequency and severity were significantly higher in the school age group compared to the other groups (P<0.05) as shown in Figure 2.

Table 1: *Demographic data and asthma severity levels of the studied group*

Category	**Frequency (%) N=125**
Age groups (years):	
Infancy (≤ 1)	10 (8.0)
Toddlers (1-3)	22 (17.6)
Pre-school (3+-6)	26 (20.8)
School (6+-12)	49 (39.2)
Adolescence (12+-15)	18 (14.4)
Sex:	
Boys	77 (61.6)
Girls	48 (38.4)

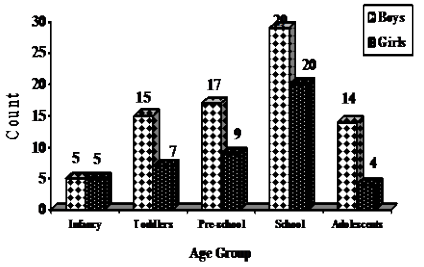

Figure 1: Count in each age group by gender

Table 2: *Asthma severity levels among the group*

Severity levels	**Frequency**		**Percent**
	Boys	**Girls**	
Mild-Intermittent	8	3	8.8
Mild-Persistent	51	23	59.2
Moderate-Persistent	16	17	26.4
Severe Persistent	5	2	5.6

DISCUSSION

In most developed countries and in some developing countries, it has been found that bronchial asthma is the commonest chronic inflammatory condition affecting the respiratory system.[13,15,16] It has been noticed that asthma has relatively different clinical severity levels in childhood and needs special additional control measures.[3,4,13]

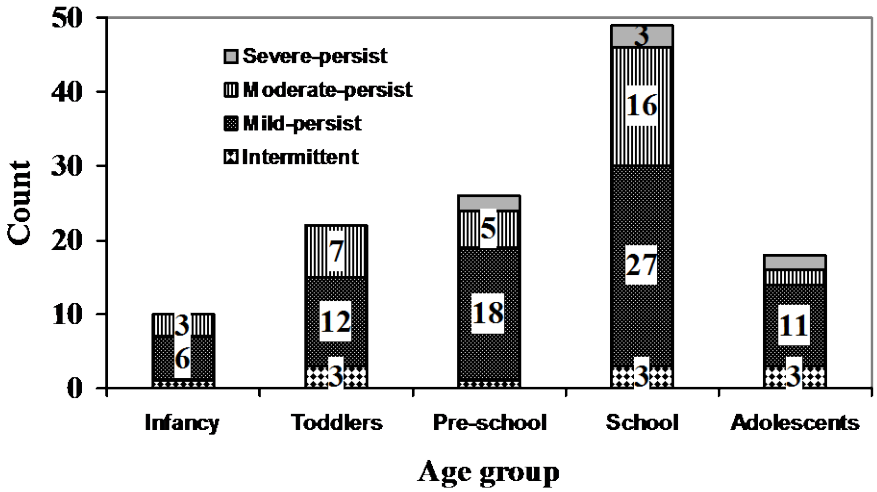

***Figure 2**: Asthma frequency and severity level*

Nevertheless, this disease can be effectively controlled by clinicians if the severity of the symptoms are recognized, the appropriate therapy is initiated, and with proper education the aggravating factors are avoided.[16,17] In this work, we tried to find the correlation between the different severity levels of asthma and the patients' age and gender factors. In other words, it was to discover which age/gender groups of asthmatics had the mildest, severest or other levels of severity.

This study revealed male predominance in all ages except in the age group of infants. Several authors have also reported this male predominance in age subgroups before the age of puberty.[5,6,18] The second important finding in this study was that boys had more severe degrees of asthma than girls. The exact mechanisms for this sex difference in asthma prevalence and severity cannot be fully explained by the anatomical difference.[19] Most epidemiological studies of bronchial responsiveness in children have found no significant difference in prevalence of bronchial hyperresponsiveness with gender.[20] However, in some studies, boys have been found to have a higher prevalence of skin test reactivity to aeroallergen and higher total serum IgE, but other studies have not confirmed this finding.[21,22] Other factors include: exercise, activity difference, passive or non-passive smoking and exposure to different outdoor environmental allergens.

The equal prevalence of asthma at infancy is probably due to the equal chances of environmental exposure and to similar physiologic and anatomic characteristics of this age. However, hyper-reactive airway disease as a result of medical or surgical causes other than bronchial asthma made the establishment of the diagnosis of asthma in this age group a difficult task for most health practitioners.[1,23,24]

In this study, the highest number of severe cases in both sexes, belonged to the school age group 6-12 years though the males predominated. Previous reports in several countries have also documented this important finding.[1,5,6,25] These gender shifts may be related to undefined hormonal or

biochemical alterations that affect immunological or biological pathways relevant to asthma pathogenesis.[8,11] Several hypotheses have been postulated for this. These include additional sensitization to new allergenic antigens abundant in the school environment, stress associated with the learning process, exposure to viral infections, food supply and the increase physical exercise at this age.[3,5,6,26] Additional preventive measures in the school environment and an increase in public awareness of the problem are therefore necessary.

In summary, the frequency of asthma has increased, being more severe among boys, particularly, of school age. This finding is compatible with what has been previously reported in other countries. Consequently, greater attention should be paid to the care of this subgroup of asthmatic children than the other groups. It is recommended that factors affecting the prevalence of asthma in school children be assessed and active preventive measures taken. The study of demographic factors will not only help in the management of this common illness but also in the prediction and prognosis of its eventual outcome.

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