RISK FACTORS FOR ASTHMATIC CHILDREN REQUIRING HOSPITALIZATION

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Abstract - Asthma is one of the most common chronic illnesses in childhood with an increased rate of hospitalization. In order to determine the considerable factors for hospitalization of asthmatic children in our patients, we carried out a retrospective study of children with asthma who were admitted to Children Medical Center affiliated to Tehran University of Medical Sciences over a 3 year period (1993-1995). In this study 100 admitted asthmatic children were evaluated including 58 males and 42 females. The mean age of patients at the time of study was 19 months (6 months - 12 years). Fifty - three out of 100 patients (53%) were admitted in intensive care unit (ICU). 26 out of 53 patients admitted to ICU, required tracheal intubation and mechanical ventilation. Among the 100 admitted patients, 78 patients had respiratory infection before hospitalization, 60 had history of emergency room visit for asthma in 48 hours prior to hospitalization and 23 patients were steroid dependent. Family of 90 patients had little formal education about asthma. We conclude that most asthma exacerbations are provoked by respiratory infections, and proper family education is essential for improving outcome of asthma management.

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Key Words: Asthma, risk factor, education, respiratory infecions

INTRODUCTION

Asthma is a very common chronic disease, affecting more than 2 million children annually. It is the most important cause of school day losses and also one of the most common etiologies of children's hospitalization and emergency room visits. Recent studies indicate that asthma incidence and the number of hospital admissions are increasing world wide (1-4).

In the United States, asthma is the most frequent reason for emergency room visits among all respiratory disorders, and is second only to pneumonia as a reason for hospital admissions (5).

Studying and recognizing leading factors toward asthma admission is an important guidance for better preventive measures and consequently can decline hospitalization and mortality rates.

Patients and Methods

Diagnosis of asthma was made according to the standard criteria, including physical examination, family history of allergy, total serum IgE levels and pulmonary function tests results. All asthmatic children who were admitted to Children Medical Center of Tehran University of Medical Sciences (TUMS) over a 3 years period (1993-1995) were included in this study. Asthmatic children who were followed as outpatients were excluded. Also we excluded patients who were admitted to hospital due to diseases mimicking asthma.

RESULTS

Based on criteria used for diagnosis of asthma, 100 asthmatic children who were admitted in Children Medical Center over a 3 year period (1993-1995) were reviewed.

There were 58 males and 42 females. The mean age of patients at the time of study was 19 months (6 months - 12 years). Forty - seven out of our 100 patients (47%) aged less than one year, 19 patients were between 1-2 years, 20% were between 2-6 years and 14% of our patients were between 6-12 years (Table 1).

Table 1- Age distribution in 100 asthmatic children

Age	Percent
< 1 yr	47%
1-2 yr	19%
2-6 yr	20%
6-12 yr	14%

There was positive familty history of atopy either in parents or siblings in 50% of our patients, including urticaria, asthma and hay fever respectively in 45%, 41% and 25%. Reviewing medical notes revealed that 70% of our patients had hospital admissions for asthma in previous years. Seventy out of our 100 patients (70%) had upper respiratory tract infections before asthma attack and admission to hospital. Sixty patients (60%) had an emergency room visit during 48 hours preceding hospital admission and 23 patients were steroid dependent. Fifty-three out of 100 patients (53%) were admitted to intensive care unit (ICU) and

26 of them required tracheal intubation and mechanical ventilation (Table 2).

Table 2- Risk factors distribution among 100 asthmatic children

Risk factors	Percent
Parent's unawarencess of their children's medical problem	90%
Respiratory infection preceding asthma attack	87%
Other asthma admission in previous year	70%
Emergency room visit in 48 hours preceding asthma attack	60%
Previous asthma admission to ICU	53%
Positive family history of atopy	50%
Intubation and mechanical ventilation	26%
Corticosteroid dependency	23%
Hypoxic encephalopathy due to asthma	6%
History of respiratory arrest during asthma attack	5%

Assessment of knowledge and attitude of parents toward asthma and its preventive and therapeutic measures, showed that 90% of parents had little formal information about asthma and their children's medical problem.

DISCUSSION

Asthma is one of the most common chronic illnesses in childhood with a high rate of hospitalization. In this study, 100 admitted asthmatic children including 58 males and 42 females were reviewed. In our study 47 out of our 100 patients (47%) aged less than one year, and totally, 80% of our patients were under 6 years. The ratio of males to females in our study was approximately 3/2.

As we noticed in our study, most frequent asthma admissions are at the age of 1 year and also there is gender differences to asthma; the rate of hospital admissions for boys are often more than girls. These age and gender differences have been shown by other investigators (2,6). Harju and his colleagues (2) analyzed all data of hospital admissions caused by asthma between 1972-1992, from Finish discharge registry. They found out that new asthma admissions were most frequent at the age of 1 year and boys were admitted twice as often as girls at the age of 1 year (11.2 in comparison with 5.9 admissions per 1000 per year).

In another study by Farber (6), he reviewed all medical records of admitted patients (less than 15 years) for asthma to the Kaiser Foundation Hospital in California between 1991 and 1993. The result of his study showed that patients aged less than 5 years or who had a history of prior hospital admission were at a higher risk for hospital readmission within 12 months of the index admission.

All these data show that most frequent asthma admissions are at the age of 1 year and asthmatic patients aged less than 5 years have significantly increased risk for hospitalization for asthma.

Prior hospitalization and/or prior emergency room visits are other risks for hospital readmission. In our study 60 out of our 100 patients (60%) had an emergency room visit during 48 hours preceding hospital admission. Schaubel and his colleague (7) in their study showed that the risk of rehospitalization for asthma increased significantly with the number of prior hospitalizations and physician visits, respectively.

The risk of rehospitalization for asthma increased significantly with the number of prior hospitalizations and prior emergency room visits, which may reflect both the persistence of asthma and the difficulty of developing an effective disease management strategy.

Prior tracheal intubation during asthma attack is another risk factor for rehospitalization.

In our study 53 out of 100 patients (53%) were admitted to intensive care unit (ICU) and 26 of them required tracheal intubation and mechanical ventilation. To find out risk factors for severe asthma attack, Leson and Gershwin (8) reviewed 57 patients through 993 asthmatic children who required tracheal intubation during asthma attack management. In the study by Leson and Gershwin (8) the significant risk factors identified were low socioeconomic status, little formal education, active tobacco smoking/ or second hand smoke exposure, parental history of allergy or asthma, intercurrent respiratoy infection, prior asthma emergeeny room visit, prior asthma hospitalization, prior intubation and steroid dependency (8).

Dependency to steroid is one of the risk factors which increases the rate of hospital admission in asthmatic patients. In our study among 100 asthmatic patients, 23 had steroid dependency.

Martin and his colleagues (9) examined 30 children with near fatal asthma; risk factors were severe asthma with frequent night awakening due to asthma, significant exercise limitations, previous hospital admission, previous ICU admissions and delay in seeking medical care.

Parental information about asthma regarding preventive and therapeutic measures and better management of asthma is a very important factor in monitoring their child, while poor information of parents leads to increased emergency room visit and rehospitalization. In our study 90% of parents had little formal information about asthma and their childrens' medical problem.

Lee and his colleague's (10) taught, parents of asthmatic children to be able to recognize wheezing by placing their ear over the chest or in front of the open

mouth of their child. Such skills should be helpful to parents in monitoring their child and deciding when to seek emergency care.

In conclusion, children aged less than 5 years or those who had a history of prior hospital admission or prior emergency room visits are at high risk for hospital readmission. We emphasize that parental knowledge could have remarkable influence in declining complications of asthma, because family education is an emergent step in better management of asthma. Family teaching can directly decline the severity of attack and rehospitalization rates.

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