THE OUTCOME OF PATIENTS WITH ACUTE BRONCHIAL ASTHMA PRESENTING TO THE EMERGENCY ROOM

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ABSTRACT

We collected data on patients above the age of 5 years with acute bronchial asthma who presented to the emergency room of Hospital Sains Universiti Sains Malaysia during the period between 1 January to 31 March 1990. Two hundred and twelve patients (57% males and 43% females) who made a total of 271 visits were recorded. This constitutes 16.3% of all adults and paediatric medical cases seen in the emergency room during this period. The majority of patients presented between 8 pm and 6 am which contrasts with the attendance pattern due to other causes. We also recorded two peak periods of presentation (between 8 pm and 12 midnight and between 6 am and 10 am). Thirty-one (11.4%) cases resulted in admission. Of the 240 cases that were successfully treated and discharged from the emergency room, there were 59 relapses (in 45 patients). Twenty-two percent of the relapses occurred within 24 hours of the last visits. We recorded lower rates of admission as well as relapses compared to all previous studies. Our finding of bimodal pattern of presentations was also not previously reported.

Keywords: Bronchial asthma, acute, emergencies, admission, recurrence.

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INTRODUCTION

Asthma is a common disease. The clinical manifestations range from mild, infrequent attacks to more severe and chronic disability. In spite of advances in the assessment and treatment of asthma, patients with recurrent acute exacerbations remain a familiar sight in emergency rooms. After initial treatment, the decision must be made, based primarily on clinical criteria, to either admit or discharge the patient.

The rate of relapse requiring further emergency room care in patients treated and subsequently discharged from the emergency room as high as 30%[1,2]. It has been well established that clinical and laboratory measurements may not reliably predict which patients are at risk for release after discharge[3-5].

The aim of this study is to review the outcome of patients with acute bronchial asthma that present to the emergency room of the Hospital University Sains Malaysia, a 400-bedded teaching hospital in Kelantan, Malaysia.

MATERIALS AND METHODS

The study was conducted during the three-month period between 1 January and 31 March 1990. Data was collected on all patients above the age of 5 years with acute bronchial asthma, regardless of severity, who were seen during this period, at the emergency room of the Hospital University Sains Malaysia, a 400-bedded teaching hospital in Kelantan. All patients had an established diagnosis of bronchial asthma which was made based on the history of paroxymal, recurrent wheezy dyspnoea which was completely or partially reversible either spontaneously or following bronchodilator therapy. Patients with bronchitis, emphysema, 'chronic obstructive airway disease' or other known lung and cardiovascular diseases were excluded.

Demographic data (age, race, sex), the discharge status (admitted or discharged), the date and time of presentation to and discharge from the emergency room, time of most recent prior episode and history of hospitalisations for asthma were recorded. The patients were studied with respect to the admission rate and whether they were seen again within the three months after being discharged from the emergency room.

Each patient was managed by the emergency room medical officer on an individual basis and neither treatment nor admission/discharge decisions were governed by protocol. However, most patients were treated according to an established general management guidelines. After treatment, the decision to discharge or to admit a patient was based on clinical criteria including respiratory rate, pulse rate, wheeze dyspnoea and use of accessory muscles. Arterial blood gases, blood pressure paradox and peak expiratory flow rate were not routinely performed.

RESULTS

There were 212 patients (57% male, 43% female) aged between 5 to 80 years who fulfilled the inclusion criteria for the study. The age and sex distribution of the patients is shown in Table I. These patients made a total of 271 visits to the emergency room during the 3 month period, constituting 16.3% of a total of 1661 adults and paediatric medical cases seen in the emergency room during this period.

Time of presentation: The frequency of emergency room visits in relation to time of presentation is shown in Fig 1. Fifty-one percent of patients with acute bronchial asthma were seen at the emergency room between 8 pm and 6 am, which contrasts with the attendance patterns for all other patients where only 20% presented during this period. Furthermore, there were two peak period (between 8 pm to 12 midnight, and 6 am and 10 am) during which 45% of patients presented to the emergency room.

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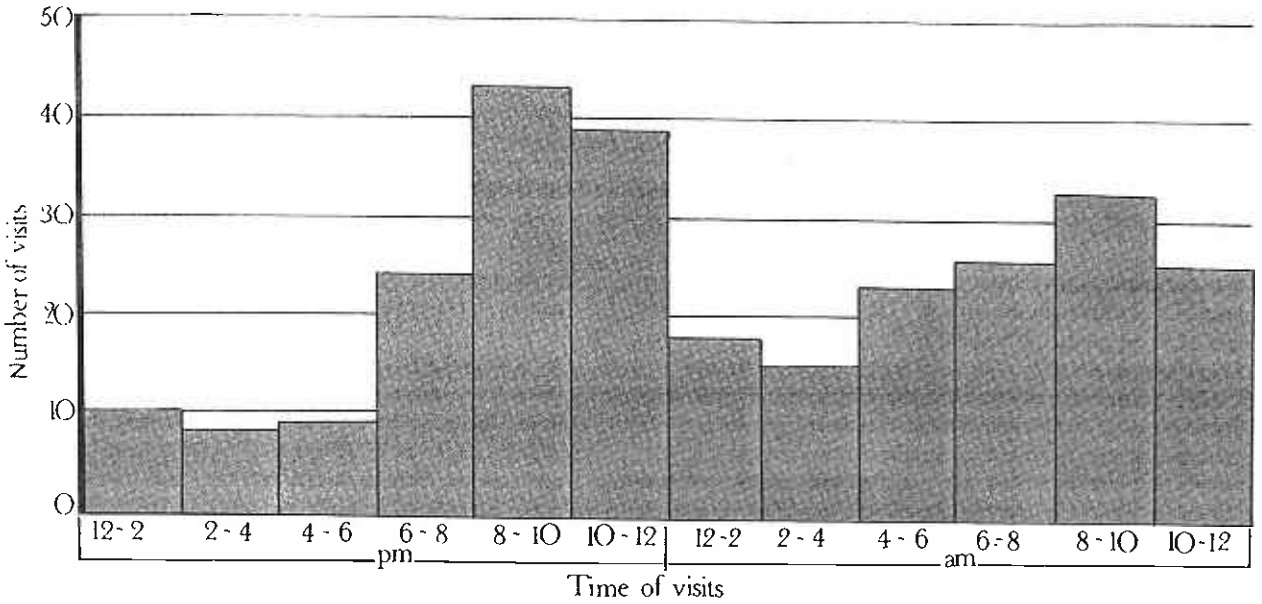

Fig 1: Time of presentation of acute bronchial asthma showing two peak periods of presentation.

Table I: The age and sex distribution in patients with acute bronchial asthma

Age group (years)	No. of cases Males	Females	Total (%)
5-10	22	18	40 (18.9)
11-20	23	15	38 (17.9)
21-30	19	15	34 (16.0)
31-40	17	23	40 (18.9)
41-50	13	9	22 (10.4)
51-60	14	4	18 (8.5)
61-70	7	6	13 (6.1)
>70	6	1	7 (3.3)
Total (%)	121	91	212 (100)

Table II: Time between relapses after initial visits to the emergency room for acute bronchial asthma

Time between visits	No. of relapses (%)
Less than 24 hours	13 (22.0)
24-48 hours	2 (3.3)
2-7 days	6 (10.3)
8-30 days	21 (35.6)
More than 30 days	17 (28.8)
Total relapses	59 (100)

Table III: The admission rate for acute bronchial asthma according to number of emergency room visits during period of study

No. of visits	No. of patients	Total visits	No. of admission (%)
1 visit	167	167	21 (12.6)
2 visits	35	70	5 (7.1)
3 visits	7	21	1 (4.8)
4 visits	2	8	4 (50.0)
5 visits	1	5	0 (0.0)
All patients	212	271	31 (11.4)

Outcome after treatment: Of the 271 emergency room visits, 31 visits (11.4%) resulted in admission and 240 visits (88.6%) ended in successful treatment and discharge. No patient was admitted to the medical intensive-care unit and there were no hospital deaths. Forty-five patients had recurrent visits to the emergency room with a total of 59 relapses within the period of study. Of these relapses, 13 (22%) occurred within 24 hours of discharge from the emergency room (see Table II). Most of these patients claimed compliance with their asthma medications. In the patients who had represented after seven days of discharge, a history of non-compliance with medications was often noted. The number of visits to the emergency room by each patient and the rate of admission is shown in Table III. One patient, a 36-year old man was seen at the emergency room five times in the 3 months of study but he was never admitted. One of the visits was within five hours after the previous attendance. He had a history of asthma for 16 years, but had never been admitted. Admission was advised on a few occasions but the patient refused. He also admitted to poor compliance.

DISCUSSION

Determining which patients are to be admitted or discharged from the emergency room is not an easy task. It has been repeatedly shown that neither the doctors' clinical judgement nor the patients' symptomatology correlate closely with mechanical or gas exchange abnormalities in acute bronchial asthma[4,9]. Fischl and co-worker developed a seven-item bedside index that they claimed would predict relapse in patients with asthma[9]. They found the index to have a 95 percent sensitivity and a 97 percent specificity when applied to a sample of emergency room patients discharged or hospitalised within 12 hours. Other investigators have reported that the index is both accurate and useful[10,11]. However, Centor et al and Rose et al failed to confirm the predictive accuracy of the index developed by Fischl and colleagues[12,13]. In their patients, the score on the Fischl index indicates to some degree the severity of asthma. However, in their discharge patients, it did not differentiate the relapse group from the successfully treated group.

Relapse is not a simple phenomenon. There are many reasons why asthmatic patients re-presented to the emergency room, including re-exposure to allergens, inadequate prescriptions or patient non-compliance. Some patients return to the emergency room because of non-medical factors such as inadequate home/social support or other psychosocial factors.

The admission and the relapse rate in our series is much lower than that was found in most other studies which reported

the admission as well relapse rate of about 30 percent[9,12,13]. These studies in the West involved contacting the patients at home to determine the outcome following discharge. This was not possible in our study because the majority of our patients has no home telephone nor reliable postal address. It is possible that our patients may have had a relapse and attended other hospitals or clinics in the vicinity. TK Lim reported a relapse rate of 31 percent at a hospital in Singapore though no home follow-up was done[14].

The pattern of presentation shows many similarities with that of previous studies which found that the majority of patients presented at night and early mornings. However, the bimodal period of presentation of our patients with acute bronchial asthma is an interesting phenomenon. Worsening of asthma symptoms at night has been recognised for many centuries. Hetzel and Clark found that a diurnal variation in PEFR occurred in normal people and asthmatic adults with a peak at about 4 pm and a trough at about 4 am[6]. An increase in the severity of airway obstruction during the early morning hours of nocturnal asthma is a common occurrence with up to 2/3 of people with asthma having this phenomenon[7]. This phenomenon of nocturnal asthma is the likely explanation for patients who presented to the emergency room between 4 am to 8 am. Those patients who presented between 8 am to 12 noon may have also had the onset of their attack in the early mornings but, in their judgement, their initial symptoms were not severe enough to require immediate emergency room treatment until later in the day when they failed to improve with treatment at home. The other possible reason may be due to the ease to obtain transport to the hospital at this time of the day. However, further studies are needed to identify the true explanation for patients to present to the emergency room at this time of the day.

The second peak of asthmatic presentation between 8 pm to 10 pm is more difficult to explain. There are a number of possible reasons including (1) reexposure to household allergens on returning home from work or after retiring to bed, (2) greater ease of transport to hospital (ie. when spouse or family are around to provide transport) and (3) to have the asthma attack treated (even if only of mild or moderated severity) before retiring to bed, to minimise the chances of severe exacerbation in the middle of the night. These explanations are all speculative and further information is required regarding both the social background of the patients and also the onset and severity of the asthma attack at presentation.

In conclusion, our study of acute asthmatic attendance at the emergency room of the Hospital Universiti Sains Malaysia shows a lower rate of admissions as well as relapse compared with most other studies. Whilst the majority of patients presented during the night (which may be explained by the phenomenon of nocturnal asthma), we also report a bimodal pattern or presentation for which the explanation is unclear.

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