

# A PROFILE OF ACUTE ASTHMA PATIENTS PRESENTING TO THE EMERGENCY ROOM

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## ABSTRACT

*We conducted a three-month prospective study on the profile of 70 acute adult asthmatic patients presenting to the Accident and Emergency Unit of a general hospital. The overall background asthmatic activity, clinical features of current exacerbation, maintenance drug treatment, gross psycho-social problems, previous experience of near-fatal asthma, and admission and relapse rates were documented. Ninety percent of the presentations were within 24 hours of the initial attack, with an average pre-hospital therapy duration of 6.5 hours. Sixty-seven percent sought further treatment after failure to find relief from their salbutamol metered-dose inhalers. Sixteen percent did not receive any treatment before presentation. Ten percent gave a past history of mechanical ventilation for severe or near fatal asthma. The majority (94%) had asthmatic symptoms in the mild to moderate range. About half (46%) had attended the Emergency Room (ER) at least once in the previous six months. On average, patients were on two items of drugs and 23% were on maintenance inhaled steroids. One-third (33%) of the patients were found to have psycho-social problems relating to their condition. The admission rate was 37% with relapse rate following ER discharge of 13%. The study showed a high proportion of patients with psycho-social problems relating to asthma, and a subset of patients with frequent visits to the ER. It also revealed the infrequent use of prophylactic therapy.*

*Keywords: Emergency Room, acute asthma, profile*

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## INTRODUCTION

The patient with recurrent asthma remains a familiar sight in Emergency Rooms (ER) despite recent advances in assessment and treatment of acute asthma. In many hospitals, the ER is increasingly used as a primary care facility for the treatment of asthma<sup>(1)</sup>. Therefore it is important that high standards of care for patients with asthma are established in Emergency Departments. Recent studies have noted deficiencies in assessment and management, including failure to perform respiratory function measurements, inadequate use of corticosteroids, over-reliance on beta agonist bronchodilators, and failure to make adequate follow-up arrangements<sup>(2,4)</sup>. In a previous study by one of the authors (TKL), one decade of 100 episodes of acute bronchial asthma study was conducted in the same hospital, looking into the number of patients who were treated in the ER. Almost one-quarter (23%) of the patients who were admitted were actually treated in the ER 24 hours before and discharged<sup>(5)</sup>. We undertook this study to document the demography and clinical profile of asthma patients with spontaneous bronchial asthma seeking treatment in the ER.

## METHODS

The study was conducted over a three-month period (August - October 1994) in an Accident and Emergency Unit of a

University-affiliated community hospital (Alexandra Hospital). Patients previously diagnosed to have asthma by their doctors and who were on treatment, were recruited for the study during their acute presentation to the ER. Seventy cases of acute bronchial asthma in patients aged 12 - 75 years were studied prospectively. Patients with chronic bronchitis, emphysema and underlying heart disease were excluded.

The patients were seen immediately on presentation by the medical officers on duty who made all treatment and admission decisions. Details of patients' current exacerbation, the number of asthma attacks, clinic or ER visits and acute exacerbations requiring hospitalisation in the preceding 6 months were recorded into a survey questionnaire. The following other details were also documented: frequency and time of pre-hospital therapy, patients' overall asthma activity, current maintenance anti-asthmatic medication, place of regular follow-up and previous experience of near-fatal asthma (eg mechanical ventilation, loss of consciousness). All patients were asked the same set of questions regarding psycho-social problems relating to their underlying asthma. Thus they were asked about whether they were anxious over their illness, if they refused to accept that they have a chronic illness (denial), if they understood the nature of their illness and treatment requirements (cognition and education), whether they felt depressed about their illness in general and whether they were current or previous drug addicts. The interviews were conducted by the attending ER doctors who had received instruction on the procedure. Some patients were admitted immediately if the asthma was judged to be of a critical severity.

A survey of relapse rates of patients who were discharged from the ER was conducted at 7 days via the telephone. "Relapse" was defined as recurrence of asthma symptoms which needed clinic/ER visit within seven days from discharge.

## RESULTS

Over the three-month study period, a total of 70 patients were recruited. Their mean age was 35.7 years (range 12-73), there were 30 male patients and 40 female patients. The ethnic mix of the patients seen was as follows: 33 Malays, 23 Chinese and 14 Indians.

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### Current exacerbation

Ninety percent of the presentations were within 24 hours of the initial attack. Most patients self-medicated or saw the Government out-patient services (polyclinics) before coming to the ER for treatment (Table I). The average time of pre-hospital therapy was 6.5 hours. The majority (67%) sought further treatment after failure to find relief from their salbutamol metered-dose inhalers. Fourteen percent received salbutamol nebulisation elsewhere prior to coming to the ER for treatment. Sixteen percent did not take any medication or inhaler therapy before presentation.

**Table I – Treatment received before attending ER**

Treatment received	Number of patients (Total = 70)	Percentage
Self	45	64
Out-patient department	10	14
General practitioner	4	6
Nil	11	16

### Overall asthma activity

Table II shows the extent of overall asthma activity. The majority (94%) had asthmatic symptoms in the mild to moderate range (symptoms less than once a month - once per week). Table III shows the extent of asthma morbidity over the preceding 6 months. About half the patients (46%) had attended the ER at least once in the previous 6 months.

**Table II - Overall asthma activity of asthmatic patients attending the ER**

Asthma symptoms/attacks	Number (Total n = 70)	%
Mild episodic (<1 per month)	26	37
Moderate (1 per month – 1 per week)	40	57
Chronic persistent (>2 per week)	4	6

**Table III - Asthma morbidity in the preceding 6 months among patients presenting to the ER**

Asthma morbidity	Average number	Range
Asthmatic attacks	4.7	0-20
Clinic visits	2.3	0-10
ER visits	1.7	0- 8
Hospitalisations	0.6	0- 7

### Maintenance drug treatment

On average, patients were on two items of drugs. The most common drug used was inhaled beta-agonist (84%). This was followed by oral beta-agonist (46%). Only about one-fifth of the patients were on maintenance inhaled steroids (23%). The various maintenance drugs that the patients were using are shown in Table IV. No patient was on sodium cromoglycate. Twenty-one percent were on regular follow-up by their general practitioner (GP), 40% by the hospital's clinic and the remainder by the Government polyclinics.

### Gross psycho-social problems

We found a high proportion (26%, or 18 of the 70 patients) who had poor education and cognitive skills regarding their bronchial asthma. Two patients were found to be overly anxious and depressed over their condition, while two others had denial-

aggression of their asthmatic state. No drug addict was seen.

### Previous experience of near-fatal asthma

There were seven cases with a past history of mechanical ventilation for severe or near-fatal asthma. The majority of such patients carried an "asthma alert" card. Of the seven, two refused admission, three were admitted (of which one was admitted to medical intensive care) and the other two were discharged. There were no asthma-related deaths during the period of the study.

**Table IV – Anti-asthmatic drugs used as maintenance treatment among asthmatic patients attending the ER**

Regular administration of	No. of patients (%)
Beta-agonist inhaled	59 (84%)
Beta-agonist oral	32 (46%)
Theophylline	20 (29%)
Steroid inhaled	16 (23%)
Steroid oral	6 ( 9%)

### Relapse rates

The admission rate was 37% with relapse rate following ER discharge (actual numbers contacted) of 13% (4/31). All patients were prescribed a short course of oral prednisolone on discharge. Approximately half (55%) the patients who were discharged knew what anti-asthmatic medications they were prescribed.

### DISCUSSION

This study looked at the clinical profile of an adult asthmatic who presents to the ER of a community hospital with an acute spontaneous attack. We also assessed the background of his asthmatic state over the preceding months, as well as the level of asthma education and cognitive skills relating to asthma. The results depict a subset of mild to moderate asthmatics who frequent the ER within a day of onset of symptoms. The majority of patients (64%) presented to the ER directly before seeking treatment elsewhere, thus using the ER as a primary care facility for treatment and relief of acute symptoms. This may be due to the lack of other 24 hour facilities available for consultation and treatment, and the lack of specialised asthma clinics. About half the patients had attended the ER for a similar episode in the preceding six months.

There was preponderance of Malay and Indian (ethnic minority) asthmatic patients seen, accounting for two-thirds of the study population. Ng et al examined differences in the prevalence of adult asthma among the three major ethnic populations in Singapore and showed that the cumulative prevalence of asthma was significantly higher in Indians (6.6%) and Malays (6.0) than in Chinese (3.0)<sup>(6)</sup>. Based on these figures, one would still expect two-thirds of patients presenting at the ER to be Chinese, as our local population is predominantly Chinese (Chinese 80%, Malay 14% and Indian 7%). The ethnic mix of our ER asthmatic population was thus significantly skewed towards the minority population. In the United States, the asthma prevalence, morbidity and mortality have been shown to be highest among minority residents, particularly blacks, and this was in association with socio-economic factors linked to poverty<sup>(7-9)</sup>. However in the local study, the higher rates of asthma among Malays and Indians could not be explained by differences in socioeconomic status<sup>(6)</sup>. A more likely reason for seeing a higher proportion of patients in minority ethnic groups could be that this was just an overall reflection of the ethnic mix of patients who consulted this particular ER during the period of the study. A larger multi-ER controlled study should be carried out to determine if patients in minority ethnic groups, who already experience a higher prevalence of the illness, also experience

greater morbidity from it.

Almost a third of the patients who consulted the ER lacked understanding and cognition of their illness and required further education on their condition and regular clinic follow-up. This is a high figure and probably represents an underestimate of the problem since no formal psychometric testing was performed and many more such patients would have poor perception and insight of their disease and may not have sought hospital treatment. Patients with psycho-social problems have increased risk for fatal asthma<sup>(10)</sup> and should be subjected to more intensive education, monitoring and medical therapy.

Another disconcerting finding was the small number of patients (32%: either inhaled or were on oral corticosteroids) who were on prophylactic therapy. Steroid therapy will reduce both admission and relapse rates in patients presenting to the ER with acute asthma and is recommended in the British, European and North American guidelines on ER management of severe asthma<sup>(11,12)</sup>. Much of the morbidity associated with asthma may have been reversed by more intensive therapy, including the regular use of inhaled steroids. We conducted an earlier prospective study on steroid therapy in acute ER asthma and found that oral prednisolone was prescribed only in 36% (29/81) of discharge episodes from the ER. The relapse rate was higher in patients who did not receive oral prednisolone than those who did (33% vs 18%). We concluded that steroids were being used less frequently than recommended in the treatment of ER asthma in Singapore<sup>(13)</sup>. In the present study, all discharged patients were given a short-course of high dose oral steroids. This could have resulted in the lower relapse rate (13%) when compared with the earlier study.

One of the limitations observed from our study was that only those answers to questions specified in our questionnaire were documented. Thus routine asthma treatment and previous intensive care unit admissions were documented in all cases, whereas other important symptoms such as nocturnal awakening and the amount of time lost from work or school as a result of asthma or the use of peak flow measurements were not evaluated.

There are other limitations to a study on the profile of patients presenting with acute asthma to the ER. These include a bias in the sample population, defects in symptom recall, over reporting of key symptoms and changes in management practice, all or any of these may have led to possible bias in the results of the study. Nevertheless, doctors must be aware that asthma is a commonly encountered and potentially fatal disease, that patients are still sub-optimally managed and much morbidity is avoidable with proper patient education and use of standardised treatment

protocols.

As has been previously noted, hospital Emergency Department often provide primary medical care for the treatment of asthma, most patients who attend being self referred. It is particularly important, if the ER is to have this role, that standards of management are high, that patients are adequately educated on the disease, and that adequate follow-up is instituted for all patients.

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