

A Study of Admission Criteria and Early Management of Adult Patients With Acute Asthma

R Kanesalingam*, Y S Lu*, J J Ong*, S S Wong*, P Vijayasingham FRCP**, T Thayaparan FRCP**, L C Loh, MRCP*

*IMU Lung Research, International Medical University, Kuala Lumpur, **Department of Medicine, Seremban Hospital, Negeri Sembilan

Summary

We studied the admission criteria and first 24-hour management of 62 asthmatic patients admitted from Accident and Emergency (A&E) department of a state hospital. Data was collected prospectively over a 6-month period from the doctors' medical records with reference to recommendations of the Malaysian Thoracic Society (MTS) on management of acute asthma. Peak Expiratory Flow Rate (PEFR) records were present in only 14.5% of the A&E notes and 54.8% of the ward notes. Most of these readings were below 75% of predicted normal values. Over half of the patients had records on ability to speak full sentences, and respiratory and pulse rates. Based on other records on criteria for life-threatening features (including arterial blood gases), 42% of patients studied had life threatening asthma exacerbations. Most received appropriate treatment as recommended by the MTS. We conclude that while most patients were admitted and treated appropriately, medical documentation regarding acute asthma assessment were inadequate in some.

Key Words: Asthma, Admission criteria, Management, Malaysia

Introduction

In recent years, clinical practice guidelines (CPG)¹⁻⁴ on asthma management have been introduced in many countries as a means to improve asthma care in the wake of the global increase in asthma prevalence⁵. Among many issues, CPG address questions on what constitutes hospital admission criteria and optimal early treatment for patients presenting in Accident & Emergency (A&E) departments. Although CPG can be successfully implemented in the A&E department and barriers to adherence are minimal⁶, studies indicate that

despite having CPG in place, there is still under-treatment and incongruous admission rates based on disease severity criteria^{7,8}.

In 1996, the Malaysian Thoracic Society (MTS) published its first CPG on adult asthma management⁹. The guidelines include recommendations on admission criteria and emergency treatment for acute asthma. We studied the admission criteria and early management of hospitalized patients with acute asthma with reference to MTS recommendations. We also

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Corresponding Author: Li Cher Loh, Department, of Medicine, Clinical School, International Medical University, Jalan Rasah, Seremban 70300, Negeri Sembilan

examined the frequency of chest X-ray (CXR) and the extent of antibiotic prescriptions for these patients.

Materials and Methods

In a prospective study over a 6 months' period (April to October 2001), adult asthmatic patients admitted from the A & E department to medical wards of an urban-based 800-bed state hospital were recruited. Only patients with clearly documented (new or previous) physician-diagnosed asthma were included. Excluded were current cigarette smokers, those who had previously smoked more than 10 pack years, those with a history of chronic bronchitis or possible chronic obstructive airways disease, and those with other co-existing lung diseases such as fibrosis. Data from doctors' notes in the A & E department and the first 24 hours of ward stay were recorded. Parameters studied were based on recommendations by MTS i.e. assessment with peak expiratory flow rate (PEFR) measurement (% predicted normal), respiratory rate, pulse rate, clinical features (ability to speak full sentences, confusion, feeble respiratory effort, central cyanosis, exhaustion, unconsciousness, silent chest), arterial blood gas analysis, use of CXR and antibiotics prescribing, and treatment with supplementary oxygen, nebulised short-acting β_2 -agonist with or without anti-cholinergic agent, oral and/ or intravenous corticosteroids; intravenous aminophylline and/or β_2 -agonist. The study protocol was approved by the local university research and ethics committee.

Results

Sixty-two asthmatic patients were recruited with a preponderance of female subjects (80.6%). The mean age of the study population was 52 years (range 14-81 years). Among the main ethnic groups, Malays constituted the highest proportion (48.4%) followed by Indians (43.4%), and Chinese (8.1%).

Only 9 patients (14.5%) had PEFR recorded in A&E notes and 34 patients (54.8%) had PEFR recorded in medical wards. Of these patients, 5 had PEFR recorded in both the A & E department and medical wards. All PEFR readings were below 75% of predicted normal value, except for five from medical wards [Figure 1]. The PEFR readings for these five patients were found in medical records alone.

With regards to documentation of clinical features to assess severity of the asthma attack, over half of these patients had documentation on ability to speak full sentences, respiratory rate and pulse rate. However, except for the respiratory rate (62% had respiratory rate of more than or equal to 25 breaths per min), only a proportion fulfilled the other criteria for acute severe asthma i.e. inability to complete sentences in a single breath (29%), and pulse rate of more than or equal to 110 beats per min (36%) [Figure 2].

The documentation of life-threatening features (LTF) in asthma was found in 8 patients' records. Seven patients had one LTF (central cyanosis in 1, confusion in 3, exhaustion in 3) and 1 patient had two LTF (exhaustion and confusion). None of the patients had any documentation on silent chest, feeble respiratory effort, and unconsciousness.

The MTS guidelines recommend measurement of arterial blood gas tensions for patients with any severe or life threatening features. We found that arterial blood gases (ABG) tensions were measured in 30 (48%) patients. Of the three ABG markers indicative of a very severe, life threatening attack (i.e. hypoxaemia, hypercapnoea, acidosis), 11 had one; 5 had two and 2 had all three markers. Taken together with those documented to have LTF, 26 (42%) patients were considered to have life-threatening asthma attacks [Table I].

Most patients had documentation on the administration of nebulised bronchodilators, intravenous and/ or oral corticosteroids, and oxygen therapy. Four patients had only one form of therapy documented (oxygen in 3,

corticosteroids in 1) and 1 patient had no documentation of any therapy [Figure 3]. Intravenous therapy with aminophylline, salbutamol or terbutaline was given to 7 patients in our study population. However only 4 of these patients had LTF or ABG markers of a life threatening attack.

Forty-four patients (71%) had chest x-ray ordered, including 15 who had clinical features or ABG markers of a severe, life threatening attack. Thirty patients (48%) were treated with antibiotics including 20 who also had chest x-ray done.

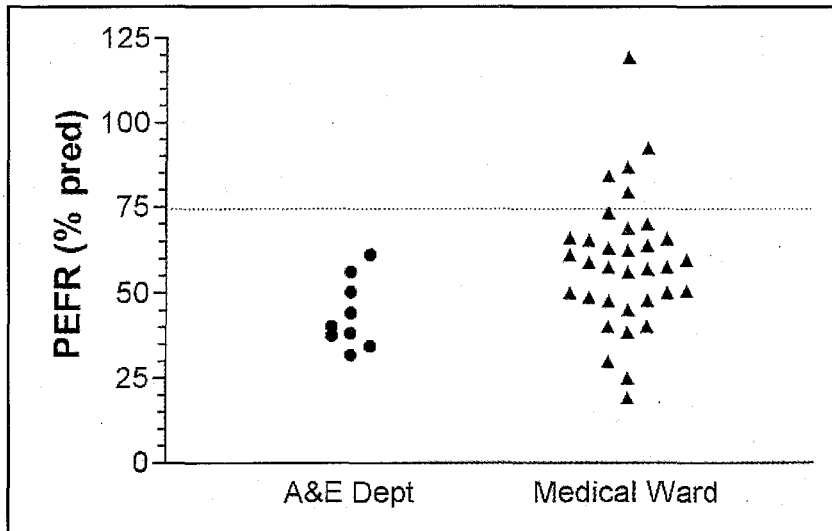


Fig 1: PEFR records in Accident & Emergency (A&E) department and medical wards during the first 24 hours

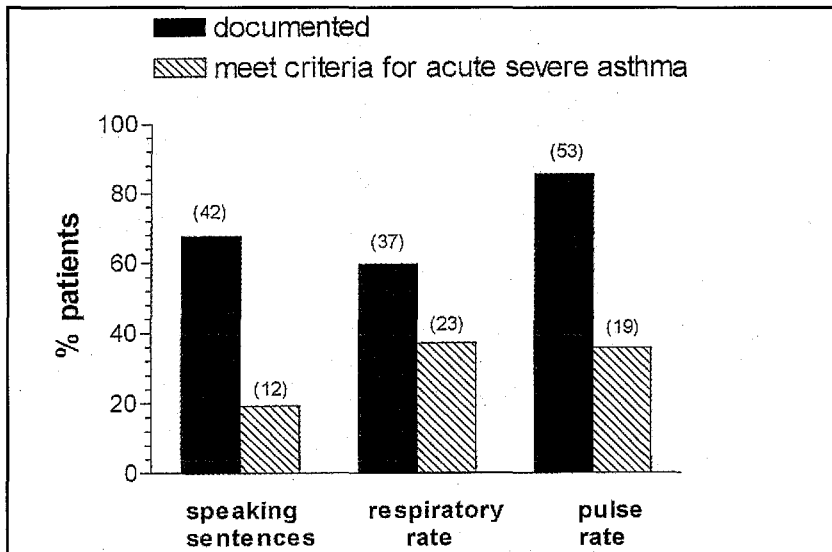


Fig 2: Documentation of clinical features in admitted patients with acute asthma

Table I: Documentation of Life-Threatening Features: Clinical and Arterial Blood Gas Criteria

CLINICAL	PATIENT (n)
Exhaustion	3
Central cyanosis	1
Confusion	3
Confusion + Exhaustion	1
silent chest, feeble respiratory effort, unconsciousness	0
ARTERIAL BLOOD GASES	PATIENT (n)
Hypoxaemia alone	11
Hypoxaemia + Hypercapnoea OR Hypoxaemia + Acidosis	5
Hypoxaemia + Hypercapnoea + Acidosis	2
TOTAL (%) PATIENTS WITH LTF:	26 (42%)

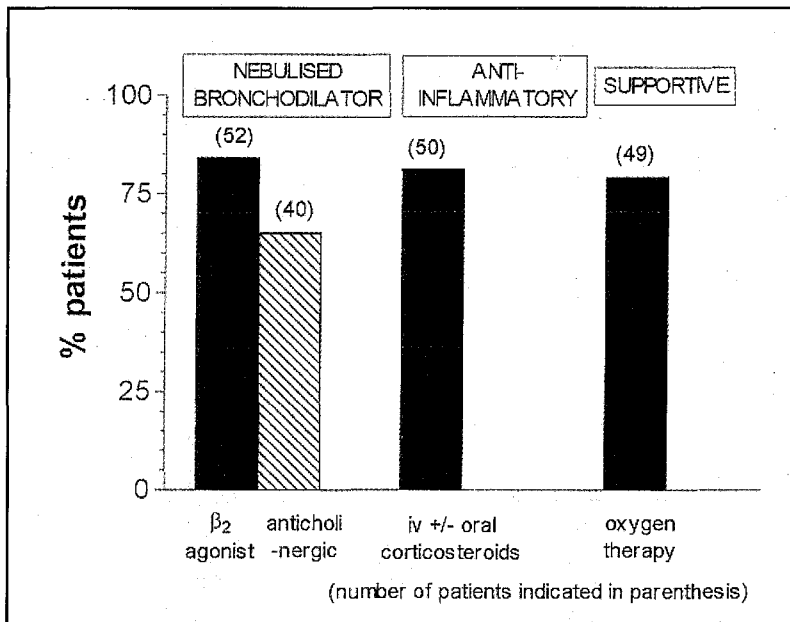


Fig 3: Therapy instituted for patients admitted with acute asthma

Discussion

While all previously published studies had entry points in the A & E department, we studied admission criteria and early management of adult patients admitted for acute asthma. To avoid confusion with other chronic airways disease that often complicates management choices, we applied strict inclusion criteria so that only subjects in whom the diagnosis of asthma could be confidently made were recruited. Because current cigarette smokers or ex-smokers who had smoked excessively were excluded, the number of subjects was relatively small for a period of 6 months.

This was primarily a study of doctors' medical documentation during the first 24 hours of admission. It was assumed that whatever was not documented was not done, and this might not be necessarily true. However, since all new admissions were tracked on a daily basis and information was prospectively collected, any significant bias in findings is, in our opinion, unlikely. Furthermore, with increasing medical litigation, doctors are required to keep comprehensive and clear records and it is assumed that documentation was fairly complete.

MTS guidelines recommend that PEFr measurement is crucial in assessing initial disease severity, response to bronchodilator therapy and need for hospital admission in acute asthma. In addition, ability to speak full sentences, the respiratory and pulse rates are advocated as three key parameters in the assessment of asthma severity during exacerbations. Our findings show that fewer than 15% of patients had PEFr recorded in the A & E department, and fewer than 55% had PEFr recorded in the medical wards. Most of these readings were less than 75% of predicted normal value, consistent with the guideline recommendations that these admissions were warranted. Documentation on ability to speak in full sentences, respiratory and pulse rates was better i.e. these were recorded for in over half of the patients. For those in whom these parameters were recorded, more than half of the patients were

tachypnoeic, more than one third were tachycardic, and more than one quarter could not speak full sentences. This suggests that the majority of patients had acute severe asthma, although PEFr was not documented in all of them. A significant proportion of the patients (42%) had life threatening attacks based on clinical and/or ABG criteria. MTS guidelines advocate that ABG should be carried out in all patients with severe or life threatening features and it is not unreasonable that most admitted patients should have ABG done to assess severity. The proportion of patients who had ABG measured in this study (48%) was rather low.

The problem with poor adherence to PEFr measurement as an assessment tool in the A & E department is not ours alone. Scribano et al⁶ in US reported that despite showing overall high adherence rates to CPG, PEFr measurement was least performed. Similarly, Reed et al⁸ in Canada showed that only 44% of patients had PEFr assessment in A&E department despite vigorous attempts in advocating CPG. While the value of PEFr assessment in acute exacerbation is clear in some studies¹⁰⁻¹², others^{13,14} have shown that the PEFr does not influence outcomes of patients presenting to A & E departments. Since we did not study those discharged from A&E departments, our findings are inadequate to address this question.

On early management, our findings showed that the majority of patients were treated according to the recommendations of the MTS. However, in a few patients, documentation was seriously lacking, suggesting an urgent need for improvement in doctors' records. The lack of correlation between those with LTF and those receiving second line therapy in the form of intravenous bronchodilator may reflect improvement in some patients following initial treatment with nebulised bronchodilator and systemic corticosteroids. It is therefore difficult to draw a conclusion on whether treatment was appropriate or not in these patients. There were no deaths or requirement for assisted ventilations in these patients during their first 24 hours. Our findings suggest that the overall early

treatment for admitted asthmatic patients was appropriate. This may reflect the familiarity of treatment measures for acute asthma among doctors, since the main modalities of treatment for acute asthma have not changed over the past twenty years.

We have found that ordering CXR and the use of antibiotic is commonly practiced for the management of acute asthma in our hospital. The scope of our study did not include radiological or microbial findings and it is therefore not possible to conclude on their appropriateness. However MTS guidelines advise that CXR should be done if there are features of severe or life threatening asthma (which were preset in the majority of our patients) and antibiotics are indicated only if there

is evidence of a bacterial infection. It may be that too many of our patients received antibiotics.

In conclusion, it appears that while most patients were admitted and treated appropriately for acute asthma, medical documentation and assessment in some patients was inadequate and this needs urgent attention. A CPG like that provided by the MTS can be useful in orchestrating a concerted effort by all relevant parties to improve the appropriateness of admissions and management. While implementing the CPG in A&E departments in the US has brought about substantial cost-saving in healthcare¹⁵, research in our own context would be more relevant in determining whether the CPG has had a positive impact on asthma morbidity, mortality and healthcare cost in Malaysia.

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