

# An Audit on the Assessment and Management of Acute Bronchial Asthma in the Accident and Emergency Department of a District Hospital

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## Summary

A study was undertaken to determine the assessment and management of adult asthmatic patients presenting to the Accident and Emergency department. The records of 50 consecutive adult asthmatic patients presenting to A & E with acute bronchial asthma between June 1993 to April 1994 were reviewed. Patients were also interviewed on their subsequent visit to hospital. Observations and measurements used to assess the severity of asthma were recorded with variable frequency – cyanosis 8%, inability to speak 2%, chest auscultation 64%, heart rate 10%, blood pressure 6%, respiratory rate 4%. The failure to record more objective measurements of severity of asthma and in particular extent of airflow obstruction is cause for concern. The drugs used to treat acute asthma in order of frequency were Beta agonists by nebuliser, 49 patients; intravenous aminophylline, 8 patients; and intravenous corticosteroids, 6 patients. 15 patients were admitted to the medical ward. The decision to admit patients appeared to be due to a lack of symptomatic improvement after treatment. Of the 35 patients who were discharged from A & E, 13 (37%) had an acute relapse within 10 days. None of the patients on discharge from A & E were given a short course of oral steroids or were advised an increase in steroid inhaler therapy. There was therefore a gross underuse of corticosteroids.

**Key Words:** Assessment, Management, Asthma, Accident and Emergency Department

## Introduction

The mortality and morbidity from asthma appears to be increasing despite changes in medical practice and many advances in treatment of asthma over the years. Most of the deaths are due to relatively acute attacks, although usually against a background of poorly controlled asthma. Many deaths and much unnecessary morbidity have been associated with overreliance on bronchodilators, underuse of inhaled and oral corticosteroids, failure to make objective measurements of severity and inadequate supervision<sup>1</sup>.

Several studies have tried to determine why patients die from asthma. Some have looked at the assessment and management of exacerbations of asthma in general practice and hospital<sup>2,3</sup>, while others have looked at individual deaths from asthma in an attempt to identify factors related to mortality<sup>4,5</sup>. All have

suggested that there are deficiencies in both assessment and treatment.

Therefore, this study was undertaken to determine whether there are deficiencies in the assessment and management of acute exacerbations of bronchial asthma in the accident and emergency department, Muar Hospital – a 405 bedded hospital. This study was designed to determine (1) when patients presented to A & E i.e. how long after onset of symptoms (2) how the severity of attack was assessed (3) how were patients treated before arrival in A & E, in A & E and on discharge (4) what were the factors influencing admission and (5) what was the incidence of early relapse.

## Materials and Methods

This study was conducted between June 1993 to April 1994. All adult asthmatic patients (i.e. patients above

12 years old) presenting to A & E with acute exacerbation of bronchial asthma were recruited into this study. Only the first visit of each consecutive patient during the study period was considered.

All patients with an established diagnosis of bronchial asthma based on a history of paroxysmal, recurrent wheeze completely or partially reversible either spontaneously or following bronchodilator therapy were recruited into this study. Patients with bronchitis, emphysema, chronic obstructive airway disease or other known cardiovascular disease were excluded.

Each patient was managed by the emergency room medical officers on an individual basis and neither treatment, admission or discharge decisions were governed by protocol. All the four medical officers covering A & E department have had a posting in an active medical unit before.

The records of the patients were reviewed after each visit by medical officers working in the medical unit. The following details were recorded:- (1) Demographic data – patient's age, sex and race (2) duration of symptoms (3) how the severity of attack was assessed in A & E (a) observation – difficulty in speaking, distress cyanosis, tachypnoea, chest auscultation (b) measurements – heart rate, respiratory rate, blood pressure and peak expiratory flow rate – before and after treatment. (4) maintenance anti-asthmatic medication that the patient was on: treatment received in A & E and treatment following discharge from A & E (5) factors influencing admission and (6) on discharge, whether patients had a relapse within ten days of discharge from A & E. A relapse was defined as an unscheduled medical visit occasioned by the patient's perceived need for further asthma treatment. To obtain data for relapse, patients were interviewed on their subsequent visit to hospital and also from review of hospital records.

## Results

There were 50 patients (30 males, 20 females) aged between 12 - 72 who fulfilled inclusion criteria for the study.

**Table I**  
Duration of acute symptoms before treatment intervention

Duration of symptoms	No. of patients	No. of admissions
< 24 hrs.	33	9
24 - 48 hrs.	1	
48 - 72 hrs.	3	2
72 - 96 hrs.	7	2
> 96 hrs.	2	2

Not recorded : 4

Symptoms of < 24 hrs: 9/33 admitted - 27.2%

> 24 hrs: 6/13 admitted - 46.1%

**Table II**  
Percentage parameters recorded in assessment of severity in 50 patients with asthma

Observations	% recorded
Distress	6%
Dyspnoea	38%
Cyanosis	6%
Tachypnoea	4%
Inability to speak	2%
Chest auscultation	64%
Heart rate	10%
Blood pressure	6%
Respiratory rate	4%
Peak flow:-	
before treatment	10%
after treatment	4%

## Management

- a) Before arrival in A & E: These were maintenance medication that patient were on long term.

**Table III**  
**Long term maintenance medication of patients**

Medication used	No. of patients
Oral Beta agonist	78%
Inhaled Beta agonists	14%
Oral theophylline	80%
Oral steroids	4%
Inhaled steroids	10%

- b) Treatment in A & E: 49 patients received Beta agonist by nebuliser. Only one patient was not given this mode of treatment as she insists she only responds to intravenous aminophylline. 6 patients who were given intravenous steroids were admitted. All 8 patients who were given intravenous aminophylline were ultimately admitted. Five of these patients were already on maintenance oral theophyllines. However, none of the patients developed signs of aminophylline toxicity and there were no deaths during the study period.
- c) Treatment on discharge from A & E: 35 patients were discharged from A & E. All patients were given a supplement of their usual maintenance medication (refer Table III). None of the patients were discharged with a course of oral steroids or were advised an increase in their steroid inhaler therapy.

Factors influencing admission to medical ward: 15 patients were admitted to the medical ward while 35 patients were discharged from A & E. Only 2 patients had their peak flow assessed after treatment before a decision was made to discharge the patient. Decision to admit was based solely on lack of improvement of symptoms after treatment in A & E.

Acute relapse within ten days: Out of the 35 patients discharged from A & E, 13 experienced an early relapse. Within 10 days of discharge, 12 patients came back to A & E for further treatment whereas one patient visited his general practitioner.

Out of the 13 patients, 4 patients relapsed twice and 2 patients thrice within the 10 days.

## Discussion

These results reveal that there are deficiencies in the assessment and management of patients with acute bronchial asthma. Although no attempt was made to verify the diagnosis of asthma in this study, we believe the diagnosis of asthma by the attending doctors were reliable enough to make this data valid.

Studies have shown that delay in instituting treatment is one of the most important factors contributing to death in asthma<sup>6</sup>. The presence of symptoms of worsening asthma for days or weeks before the patient seeks medical attention is associated with increase severity of attacks<sup>7</sup>. 27.2% of patients with symptoms of less than 24 hours were admitted supporting the observation that longer duration of symptoms probably results in more severe asthma.

One of the most striking features of this study is the variable frequency with which data was recorded. The assessment criteria chosen in this study are a combination of symptoms and signs. Distress, cyanosis and inability to speak are criteria suggestive of a very severe or life threatening attack<sup>1</sup>. Objective criteria i.e. heart rate, blood pressure, respiratory rate and especially peak flow are useful predictors of severity<sup>1</sup>. The recording of observations in this study were disturbingly low. Incomplete data recording may reflect tendency not to record negative findings. Alternatively, casualty officers may not be familiar with clinical features associated with severe asthma. Although peak flow meters are available for use in A & E, PEFR was only recorded in 10% of patients before treatment and in 4% after treatment. In studies done in United States however, over 80% of patients had their PEFR done<sup>8</sup>. Although there were no obvious problems in patients in whom peak flow was not measured, there is no ground for complacency. Although deaths in A & E due to asthma are rare, the aim of an objective measurement of airflow obstruction is to try and identify patients most at risk. An almost invariable feature of deaths from asthma has been the absence of objective measurement of airflow obstruction before death, both at home and in hospital.

The most popular maintenance medication for patients with chronic asthma appears to be a combination of

oral Beta agonists and theophyllines, similar to other published series<sup>9</sup>. There appears to be an underuse of inhaled bronchodilators. This may be because inhalers were specialist items and also because of budget constraints. In keeping with current recommendation, the treatment of choice for patients with acute asthma appears to be Beta agonist by nebuliser<sup>10</sup>.

Determining which patients should be admitted and who should be discharged is by no means an easy task. In this study, patients were admitted because of a lack of symptomatic improvement after treatment in A & E. Studies have shown that patient's symptoms alone or doctor's clinical judgement does not correlate with mechanical or gas exchange abnormalities in acute bronchial asthma<sup>8</sup>. A predictive index developed by Fischl and co-workers were reported to be helpful in determining the severity of asthma<sup>8</sup> and to predict outcomes reliably but subsequent studies have not confirmed its value in the A & E department.

The most disconcerting findings of this study is the gross underuse of corticosteroids. None of the patients on discharge were given a short course of corticosteroids or were advised an increase in steroid

inhaler dosage. A short course of prednisolone is indicated in the prevention of early relapse after emergency treatment of acute asthma<sup>11</sup>. The relapse rate in this study (37%) appears to be higher than other studies.

In conclusion then, there is no doubt that we have to persevere in the education and training of our doctors in the optimal assessment and management of acute bronchial asthma. The findings of this study will be used to implement strategies to modify the management so as to improve the outcome of patients with acute exacerbation of asthma in the Accident and Emergency Department of our hospital.

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