Asthma management in accident and emergency and the BTS guidelines—a study of the impact of clinical audit

Ian M Stell

Abstract

Objective—To determine whether the care of asthma patients in accident and emergency Departments (A&E) is improved by clinical audit of asthma management.

Methods—The quality of care during continuous cycles of clinical audit was compared with that one year later, after an audit programme had ended and most of the medical staff had changed. This was done by a retrospective case notes review of all asthma cases ($n = 79$) in April and May 1993, compared to the same months ($n = 93$) in 1994.

Results—The quality of care was higher during the audit in a number of areas, as determined by conformity to the British Thoracic Society (BTS) guidelines. Comparing the management of episodes for the earlier to the later study periods, the significant differences were: the ability to complete a sentence in one breath was recorded in 63% and 33% of episodes; a nebuliser was given when indicated in 97% and 88%; when indicated a chest x ray was ordered in 73% and 43%; and arterial blood gases were measured in 73% and 33% of episodes.

Conclusions—The initial assessment and management of asthma was better when the audit was in progress. However, in both study periods some areas of care did not receive the attention recommended in the BTS guidelines, these were all areas which would have influenced asthma control after discharge.

(*J Accid Emerg Med* 1996;13:392-394)

Key terms: asthma; clinical audit; guidelines.

Clinical audit is one way of familiarising staff with treatment guidelines and protocols. One area for which we have important national treatment guidelines is in the care of asthma. This study was designed to see how effectively a clinical audit programme established these treatment guidelines, and in what areas important deficiencies remained.

The reason that such guidelines have been published for asthma is that attention to detail in managing asthma patients makes a difference. Many studies of asthma deaths have found deficiencies in medical management, and these same, avoidable, factors have been identified repeatedly over many years.¹ So in order to try to overcome these problems,

national guidelines of "best practice" were published in 1990, and after some revision, in 1993 (BTS guidelines).²

As well as publishing these guidelines, it is also important to ensure that the guidelines are disseminated to those making decisions on managing asthmatic patients. This can be done by using the guidelines in an audit programme, using them as the standard against which the quality of care is compared. The objectives are both educational, to familiarise staff with the details of the guidelines, and clinical, to improve the care for asthma patients in the department.

This study was conducted to see whether the national guidelines were better followed during cycles of clinical audit, by comparing care during a period of continuous cycles of audit with that in a comparable period with no audit.

Previous studies have shown improvements in asthma management in successive audits of inpatient care in individual units.^{3,4} Published audits of asthma care in A&E^{5,6} have concentrated on quality issues in particular areas of asthma management, and have not shown whether the audits themselves have led to improvements in care.

Methods

The quality of asthma care in April and May 1993 was compared with that in the same two months in 1994. This was done by a retrospective case note study, run quite separately from the departmental clinical audit programme.

The department conducted a clinical audit of asthma care between February 1992 and November 1993. A total of four cycles were completed. All members of the A&E department were involved. This analysed various aspects of the assessment and management of asthma, using questionnaires structured around the guidelines published by the British Thoracic Society and others (BTS guidelines).² At departmental audit meetings the results were presented to the staff, weaknesses discussed, and methods for improvement considered. Asthma care was audited continually for a period of 21 months, interspersed by feedback meetings. As a result of these discussions a rubber stamp was introduced, as a reminder of the details of initial assessment of asthma. This was later replaced by a pro-forma insert to be added to the A&E record, covering all areas of asthma assessment and management. This has remained in use since. There

Accident and
Emergency
Department, Guy's
Hospital, St Thomas
Street, London
SE1 9RT
I M Stell

Correspondence to:
Dr I M Stell.

Accepted for publication
15 July 1996

Table 1 Quality of initial assessment of asthma

	1993 (n=71)	1994 (n=93)	Difference between proportions (95% CI)
Predicted PEFR recorded	36 (51%)	41 (44%)	0.07
Ability to complete a sentence in one breath recorded	45 (63%)	31 (33%)	0.30 (0.15 to 0.45)*
Pulse rate recorded	67 (94%)	88 (95%)	0.01
Respiratory rate recorded	64 (90%)	85 (91%)	0.01
Initial PEFR recorded	67 (94%)	91 (98%)	0.04

CI, confidence intervals; PEFR, peak expiratory flow rate

* Statistically significant, $P < 0.05$.

Table 2 Quality of initial treatment of moderate and severe episodes of asthma

Action recommended	1993 (n=66)	1994 (n=73)	Difference between proportions (95% CI)
Give nebuliser	64 (97%)	64 (88%)	0.09 (0.005 to 0.17)*
Give steroids	50 (76%)	55 (75%)	0.01

CI, confidence intervals.

* Statistically significant, $P < 0.05$.

Table 3 Quality of some aspects of management of severe episodes of asthma

Action recommended	1993 (n=45)	1994 (n=42)	Difference between proportions (95% CI)
Ordering CXR	33 (73%)	18 (43%)	0.30 (0.10 to 0.50)*
Taking blood for arterial blood gases	33 (73%)	14 (33%)	0.40 (0.21 to 0.59)*
Requesting, or organising admission	33 (73%)	28 (67%)	0.07

CI, confidence intervals.

* Statistically significant, $P < 0.05$.

was no other teaching on A&E management of asthma, other than that arising from the audit.

The group of senior house officers (SHOs) in post from 1 August 1993 were the last to be exposed directly to this audit. By the next year the group which started on 1 February 1994 were encouraged to follow the BTS guidelines, but were not exposed to asthma audit or given specific teaching on asthma management.

In this study I took the opportunity presented by the ending of the asthma audit to see how care changed afterwards. Staff were not aware that the study was in progress, and there was no feedback meeting. The study periods were chosen to be in the middle of the SHOs' posts, when they would have gained some familiarity with local practice, and such that the later study period would be after nearly all the medical staff concerned would have changed.

All cases where the diagnosis entered on the departmental computer was asthma during the two study periods were identified. This included patients seen by A&E staff, and those directly accepted by admitting teams, or referred to them by A&E.

Information was obtained on age, sex, asthma assessment, management, disposal, and follow up from all sets of A&E records, and hospital notes where relevant. Each episode of asthma was categorised as mild, moderate, severe, or severe with life threatening features, according to the BTS guidelines. The subsequent management was compared with that recommended for the severity category. The quality of asthma care was gauged by how closely it conformed to the BTS guidelines, rather than by looking at overall outcomes, reattendances, and so on. This approach has been widely used,³ relying on the general acceptance that these guidelines represent the best standards of care.

For each area analysed, the proportions where the recommended action was taken were compared between the two study periods by calculation of the confidence interval for the difference between two unpaired proportions.⁷

Results

There were 79 episodes of asthma in the study months in 1993, and 93 in 1994. The 79 episodes in 1993 were suffered by 66 individual patients, of whom 37 were females, with an overall mean age of 36.5; for 1994 the 93 episodes were suffered by 70 patients, of whom 43 were females, and with an overall mean age of 34.4.

Information was incomplete for nine episodes in 1993 and two episodes in 1994.

The comparison of quality of initial assessment of asthma is shown in table 1.

All episodes graded as moderate or worse should have been treated with a nebuliser and with oral or parenteral steroids, according to the guidelines. The comparison for this area for the two study periods is shown in table 2.

All episodes graded as severe or severe with life threatening features should have a chest x ray taken, arterial blood gas measurements, and arrangements made for the patient to be admitted, according to the guidelines. The comparison for this area is shown in table 3. In this table the numerators in 1993 are identical, but they relate to a different 33 episodes in each case.

The comparison between the two periods for those aspects of management related to the ongoing care of the patients asthma is shown in table 4.

Table 4 Quality of management in those areas relating to the control of the patient's asthma after discharge

Action recommended	1993		1994		Difference between proportions
	Episodes	Total where this action was taken	Episodes	Total where this action was taken	
Inhaler technique checked	71	9 (13%)	93	6 (7%)	0.06*
Whether patient has a peak flow meter at home	71	6 (8%)	93	5 (5%)	0.03*
Whether steroid tablets were given on discharge, when recommended, for those not admitted	30	19 (63%)	47	25 (53%)	0.10*
Whether adequate follow up arrangements were made, for those not admitted	37	13 (35%)	64	18 (28%)	0.07*
Whether regular treatment was stepped up, for those not admitted	30	6 (20%)	47	16 (34%)	0.14*

* Not statistically significant.

Discussion

The main finding of this study was that there was a decline in the quality of acute asthma care after regular audit cycles were discontinued. An additional finding was that in both years, areas of asthma management which could be said to be related to the ongoing care of the patients' asthma after discharge were poor when compared to the national guidelines.

In a retrospective casenote review such as this, the results are probably underestimates in some areas, because of underrecording of clinical information in the notes; however, this would be unlikely to affect one year more than the other.

Even during the audit in the earlier study period, there were areas where there were important deficiencies. Although predicted peak flow was only recorded in 51% of episodes, it may have been considered, mentally, when the management was being planned, and be an example of underrecording. However, the fact that only 73% of severe episodes of asthma resulted in admission is striking. Two factors may account for this. Many patients improve considerably after a nebuliser and are reluctant to stay in hospital, and for the same reason admitting teams, concerned about bed usage, may be reluctant to admit them. One other factor which may have diluted the impact of the audit in the earlier study period is that many of the patients were managed by members of the admitting teams, who were not directly exposed to the audit.

The BTS guidelines recommend several steps be taken before discharge, which relate to the continuing care of the patient's asthma, such as checking inhaler technique and arranging follow up. These steps were often not taken in both years. However, underrecording may partly explain this. The large proportion not given steroids, but who should have been, is a concern. Possible causes for this include a failure to categorise the severity correctly, a reluctance to give steroids to patients who may feel very well after nebuliser treatment, and a reluctance of some patients to take steroids. The underuse of oral steroids has been a repeated

finding in patients discharged from A&E,^{5,6} and even among many admitted.⁸ Only those under the care of respiratory physicians appear to achieve the desired management.⁹ A&E staff also appear to be reluctant to step up regular asthma treatment, which usually means the provision of, or an increase in the dose of, inhaled steroids. This may be perceived as the task of the general practitioner or chest clinic.

So clinical audit of asthma management improves the care of asthmatics in an A&E department, at least while cycles continue. Perhaps more importantly it is a powerful way of disseminating practice guidelines to junior doctors, many of whom will care for asthmatics in the future in both hospital medicine and general practice.

I would like to thank Dr R Rona of the Department of Public Health Medicine at St Thomas' Hospital whose suggestion led to this study, Dr P J Rees, chest physician at Guy's Hospital for help with the manuscript, and Dr D P Watson, consultant in the A&E department at Guy's Hospital for help with computerised records and data collection.

- 1 Harrison BDW, Pearson MG. Audit in acute severe asthma—who benefits? *J R Coll Physicians Lond* 1993;27:387–90.
- 2 The British Thoracic Society, The British Paediatric Association, The Research Unit of the Royal College of Physicians of London, The Kings Fund Centre, The National Asthma Campaign, The Royal College of General Practitioners, the General Practitioners in Asthma Group, The British Association of Accident & Emergency Medicine and the British Paediatric Respiratory Group. Guidelines for the management of Asthma in adults and children. *Thorax* 1993;48(suppl):S1–24.
- 3 Bucknall CE, Robertson C, Moran F, Stevenson RD. Improving management of asthma: closing the loop or progressing along the audit spiral? *Qual Health Care* 1992;1: 15–20.
- 4 Lim KL, Harrison BDW. A criterion based audit of inpatient asthma care. Closing the feedback loop. *J R Coll Physicians Lond* 1992;26:71–5.
- 5 Gibson PG, Talbot PI, Hancock J, Hensley MJ. A prospective audit of asthma management following emergency asthma treatment at a teaching hospital. *Med J Aust* 1993; 158:775–8.
- 6 Epton MJ, Skidmore C, O'Hagan JJ, Curry C, Wood-Baker R, Town GI. An audit and international comparison of asthma management in the emergency department. *N Z Med J* 1994;107:26–9.
- 7 Gardner MJ, Altman DG. Calculating confidence intervals for proportions and their differences. In: Gardner MJ, Altman DG, eds. *Statistics with confidence*. London: BMJ Publishing Group, 1989:29.
- 8 Bell D, Layton AJ, Gabbay J. Use of a guideline based questionnaire to audit hospital care of acute asthma. *BMJ* 1991;302:1440–3.
- 9 Bucknall CE, Robertson C, Moran F, Stevenson RD. Differences in hospital asthma management. *Lancet* 1988; i:748–50.