

Audit in acute severe asthma—who benefits?

ABSTRACT—This paper reviews published audit activity for a single common condition (asthma). Has this effort brought about better care for the patient? The result of this audit of audits reveals that specialists do follow the guidelines on the management of acute asthma with good results, but that general physicians, in whose care perforce many acute episodes are managed, do not seem to be aware of the published good practice guidelines.

To prove its practical value, medical audit should lead to:

- identification and solution of problems; and
- recognition and maintenance of high quality services.

But what does really happen as the result of audit? Are recommendations implemented, and are patients the better for it? If not, were the recommendations wrong or inadequately implemented? If benefit does result, was this because of a change in the patient population, or was the improvement truly the result of better medical practice?

Types of audit

There are five types of medical audit (Table 1). To be effective, the first three require medical records systems and medical notes, both of high quality, though it is possible to design a summary or even a clerking sheet to facilitate criterion based audits [1].

Each of these types of audit has been applied to asthma.

Variation from the norm in outcome—sentinel case audit

This in-depth audit is applicable in relatively uncommon but serious situations like death from asthma. Between 1973 and 1985 there were seven such studies (Table 2) [2–8].

The last two studies in Britain and New Zealand, which were also the largest, demonstrated potentially preventable factors in over 80% of the deaths. More recent confidential enquiries in the North-East Thames

region [9], in Norwich [10] and in Mersey [11] have shown similar findings. The Norwich study has confirmed the New Zealand observation that psychosocial factors can make a major contribution to premature death from asthma. Table 2 shows the preventable factors highlighted in these studies. It is depressing to note that there seems to have been little improvement over the years despite this wealth of information.

One interpretation of the results of these mortality studies is that one-off studies only detect the same problems but have no impact on improving practice. This implies that publishing papers, even in accessible medical journals, is not an effective way of sharing knowledge with the rest of the profession, many of whom appear to remain ignorant of the need to improve practice. An alternative view might be that the prevalence of asthma has significantly increased but, as the number of deaths in the 1980s has not increased, the proportion of asthma patients who have died is smaller. But even this optimistic view cannot hide the persisting documented deficiencies in care.

These frustrations were some of the stimuli that led to the generation and publication in 1990 by the British Thoracic Society (BTS) and the Royal College of Physicians (RCP) of guidelines on the management of asthma in adults [12,13]. More recently, the National Asthma Campaign (NAC) has taken the lead in establishing a UK asthma task force, one of whose subgroups will coordinate and help establish an on-going confidential enquiry into asthma deaths in Scotland and Wales and four regions of England. These enquiries are analogous to the *Report on British confidential enquiries into maternal deaths in the UK 1985–7* [14]. It is hoped that these enquiries will not only provide early information as to whether or not the national asthma guidelines are changing practices of care in the community but will also be a source of information for local practitioners and hospital doctors. It is possible that local feedback in the immediate aftermath of an asthma death may have more impact on medical practice than a published article at an undetermined time later.

Table 1. Types of medical audit

- 1 Variation from the norm in outcome—*sentinel case audit*.
- 2 Departure from specified outcome criteria—*criterion based audit*.
- 3 Comparison of care by different groups of physicians—*criterion based audit*.
- 4 Patient satisfaction surveys.
- 5 Peer review.

B D W HARRISON, FRCP
*Consultant Physician, Department of Respiratory
 Medicine, West Norwich Hospital*
M G PEARSON, FRCP
*Consultant Physician, Aintree Chest Centre,
 Fazakerley Hospital, Liverpool*

Table 2. Studies of asthma deaths—potentially preventable factors

| Year | Authors | Undertreatment with steroids | Inappropriate therapy | Underestimation of condition by doctor | Underestimation of condition by patient | Failure to recognise or treat months or weeks prior to acute attack | Psychosocial factors |
|------|--|------------------------------|-----------------------|--|---|---|----------------------|
| 1975 | Cochrane, Clark [2] | * | * | * | * | | |
| 1976 | Macdonald, Seaton, Williams [3] | * | * | * | * | * | |
| 1976 | Macdonald, Macdonald, Seaton, Williams [4] | * | * | * | * | * | |
| 1979 | Bateman, Clarke [5] | * | | | * | * | |
| 1980 | Ormerod, Stableforth [6] | * | * | * | * | * | |
| 1982 | British Thoracic Association [7] | * | | * | * | * | |
| 1985 | Sears, Rea, Beaglehole, <i>et al.</i> [8] | * | * | * | * | * | * |
| 1987 | Eason, Markowe [9] | * | * | * | * | * | |
| 1993 | Wareham, Harrison, Jenkins, Nicholls, Stableforth [10] | * | * | * | * | * | * |
| 1993 | Somerville, Ryland, Williams, Pearson [11] | * | * | * | * | * | |

Departure from specified outcome criteria—criterion based audit (Table 3)

Standards of care for patients with asthma were defined in the national asthma guidelines published in 1990 [12,13] and updated in 1993 [15]. These guidelines were intended to be practical. Lim and Harrison have shown that such standards are achievable with a criterion based audit, at least on a specialist respiratory medical ward [1].

This study demonstrated a high quality of general practice referral in Norfolk, as well as a high quality of ward based asthma management in a dedicated specialist setting. Problems with checking inhaler technique and discharging patients before their peak flow variability has fallen to the agreed level, were identified at the first audit. Marked improvement followed direct feedback to the clinicians and nurses involved, and adherence to local asthma guidelines has been confirmed on subsequent audits.

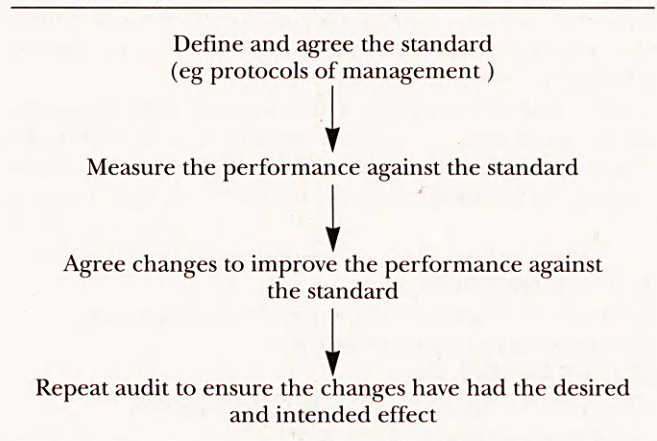
A recent national audit by the research unit of the general practitioners (GPs) in asthma group (GPIAG) of the management of 1,805 asthma attacks severe enough to prevent normal activities assessed actual practice against guidelines [16]. The patients' state of breathlessness or distress was recorded in 97% and peak flows in 82%, which reflected good practical assessment of the attack. However, the standard of drug therapy during and after recovery from the attack appeared to be worryingly below that recommended in the guidelines. For the attack, only 56% received systemic steroids and 31% nebulised bronchodilators, while maintenance treatment was not increased ('stepped up') in over three-quarters of the patients already taking anti-inflammatory medication.

Comparison of care by different groups of physicians—criterion based audit

Over the past six years studies from Birmingham and Manchester [17,18], Glasgow [19,20] and London [21] have shown that the processes and outcome of care of patients with asthma are significantly better for patients looked after by teams that include a specialist respiratory physician than by teams without such a specialist. Ormerod, Stableforth and colleagues have shown that improvement in management following feedback of results from the initial surveys and further education, applies to care provided both by respiratory physicians and by general physicians, though specialist care remains at a higher level of quality [18].

Following the production of the national asthma guidelines in 1990 [12,13] the BTS, the RCP and the

Table 3. Criterion based audit



NAC established an audit of hospital inpatients with asthma in 36 hospitals across the nation. The initial audit was performed immediately prior to publication of the guidelines in the *British Medical Journal*. That 1990 audit found significant deficiencies in asthma care, particularly when the patient was cared for by a non-respiratory physician. Respiratory physicians were more likely to make objective assessments of severity, to prescribe systemic steroids, and to arrange outpatient follow-up. The BTS/RCP/NAC audit was repeated one year later. By then, the guidelines had been published and discussed for nearly 12 months, and a significant amount of publicity for asthma had arisen from the Government debate about whether or not to include asthma in its *Health of the nation* document, and while GPs were setting up asthma clinics. Each doctor involved in the first audit had received the results of the national audit and also the data for his or her own hospital. In spite of this direct feedback and the publication of guidelines, the repeat audit showed no significant improvement in any of the process or outcome variables measured. The marked differences between management provided by specialist and non-specialist physicians were still present [22]. These audits [17–22] have shown that improvements can be made by demonstrating both problems and deficiencies in care, but that the care provided by general physicians has not yet risen to the quality of care provided by respiratory physicians, even when district protocols have been formulated and locally agreed.

The national audit of acute asthma care in general practice [16] did not report on the standard of care available from GPs with and without a special interest in asthma. It is known, however, that GPs from the GPIAG prescribe more inhaled steroids than the average, which suggests that they follow the guidelines more closely [23]. The hypothesis that there is also a difference in outcome needs to be tested.

Patient satisfaction surveys

Little has yet been published on patient satisfaction surveys in asthma. Such surveys should include general questions about patients' satisfaction with their outpatient or inpatient care, and specific questions about diagnostic techniques such as arterial blood sampling or fibre-optic bronchoscopy, or about aspects of treatment such as waiting times or drug therapy. They add an important dimension to audit in that, however closely it is thought that medically generated guidelines or protocols should be followed, patients' own opinions must be respected and reflected in the care provided.

One survey conducted by MORI, and sponsored by the NAC, asked 1,490 patients what they expected of their asthma care. The overwhelming majority (94%) opted for care under a chest physician or asthma specialist rather than a generalist (personal communication).

Thus far, most patient surveys have concentrated

largely on the 'hotel' aspects of care. These are not unimportant but must not be allowed to proliferate at the expense of questions relating to patients' medical and nursing care.

Peer review

The BTS has established a peer review scheme based on a pilot scheme initiated by the Yorkshire and East Anglian Regional Directors of Public Health in 1989. Preliminary reports (Page R, personal communication) from the visits already undertaken in the BTS scheme suggest that both the visitors and the visited consultants derive considerable benefit from the mutual exchange of views about practice, problems and their solutions. Sharing a unit's successes is easy, but allowing outsiders free rein to find and comment on problems is more difficult. The confidential intraprofessional approach allows frank constructive suggestions to be made about alternative approaches. Problems with staffing levels and mix, the provision of facilities, and whether or not the departments use national or local guidelines and protocols for the management of common diseases can be identified. It remains to be seen what impact reports produced by two visiting external consultants in the same specialty will make on the service provided. The intention is to evaluate this one year after the visit (Page R, personal communication).

Discussion

We have concentrated on audit of asthma deaths and the care of patients with acute severe asthma since these are the fields with most published data.

The studies of asthma deaths have revealed similar results year after year. Publishing them in medical journals does not achieve completion of the audit feedback loop in that, although the results are available, the requisite action to change asthma management has not followed. It is too early to know whether the first on-going confidential enquiry will improve practice and outcome, but the NAC has adopted it as a model for similar enquiries across Great Britain.

Criterion based audits of the care of patients with acute severe asthma have demonstrated that:

- asthmatics are better looked after by specialists than by generalists;
- high standards of care are achievable;
- agreed protocols of management, and audits that define the current level of care and point out where improvements are required, can improve practice both by generalists and by specialists—but specialist care is always better. In some cases generalists' care remains significantly substandard despite agreement to district protocols.

National guidelines are of undoubted value in supporting the creation of local guidelines and protocols,

which in turn can be used to audit local practice. But if change does not follow problem identification, audit has failed and has been a waste of time.

The large BTS/RCP/NAC audit attempted to complete the feedback loop by returning data to individual hospitals. It is known that many of the consultants used this information at their hospital meetings, but the repeat audit suggests that although the data had been seen they had not been acted upon. Are national, centrally inspired, multicentre audits less likely to change practice than local ones and, if so, why? Is it because locally inspired audits achieve greater local 'ownership'? Other reasons for failure to implement improvements may include lack of resources, unwillingness to accept organisational change, and conservative medical practice.

What improvements should follow the studies already published?

1 It would be ideal if all asthmatics in hospital could be under the care of a specialist respiratory physician and not a general physician. The majority of general physicians are physicians with a non-respiratory interest. Is it realistic to expect the latter to keep up to date with developments in asthma care as well as in their own specialty? At the very least, patients with asthma should be managed according to a protocol developed and agreed by the local respiratory physician; hospital outpatient follow-up should be provided exclusively by specialist respiratory physicians.

Since it is unlikely that all asthmatic episodes will be managed by respiratory physicians, a positive but careful educational programme with frequent feedback review will be necessary.

2 Purchasers are charged with a duty to purchase and specify both quantity and quality of care for their resident population. They may well specify that asthma care conforms to the principles of the national asthma guidelines, albeit adapted to suit local circumstances. This could include specifying an individual to coordinate local policy.

3 Asthma is usually a lifelong disease. Patients have a right to expect consistency between their general practice and their local hospital. This requires active liaison between hospital and GPs in every district. It is unlikely that anyone other than the local respiratory physician will be in a position to coordinate this process.

In answer to the questions posed earlier, audit sometimes changes practice, and recommendations are sometimes implemented with improvement in the processes and sometimes the outcomes of patient care. Results are not consistent. Local 'ownership', involvement, interest and commitment may be more important than national pronouncements or published articles. Perhaps we should now 'audit the audits' to determine which of them result most often in worthwhile improvements in care.

References

- 1 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.
- 2 Cochrane GM, Clark TJH. A survey of asthma mortality in patients between ages 35 and 64 in the Greater London hospitals. *Thorax* 1975;**30**:300-5.
- 3 Macdonald JB, Seaton A, Williams DA. Asthma deaths in Cardiff 1963-74: 90 deaths outside hospital. *Br Med J* 1976;**1**:1493-5.
- 4 Macdonald JB, Macdonald ET, Seaton A, Williams DA. Asthma deaths in Cardiff 1963-74: 53 deaths in hospital. *Br Med J* 1976;**2**:721-3.
- 5 Bateman JRM, Clarke SW. Sudden death in asthma. *Thorax* 1979;**34**:40-4.
- 6 Ormerod LP, Stableforth DE. Asthma mortality in Birmingham 1975-7: 53 deaths. *Br Med J* 1980;**280**:687-90.
- 7 British Thoracic Association. Death from asthma in two regions of England. *Br Med J* 1982;**285**:1251-5.
- 8 Sears MR, Rea HH, Beaglehole RG, Gillies AJ, et al. Asthma mortality in New Zealand: a two year national study. *N Z Med J* 1985;**98**:271-5.
- 9 Eason J, Markowe HLJ. Controlled investigation of deaths from asthma in hospitals in the North East Thames Region. *Br Med J* 1987;**294**:1255-8.
- 10 Wareham NJ, Harrison BDW, Jenkins PJ, Nicholls J, Stableforth DE. A district confidential enquiry into deaths due to asthma. *Thorax* 1993; (in press).
- 11 Somerville M, Ryland I, Williams EMI, Pearson MG. Asthma deaths in Mersey in 1989-90. *Thorax* 1993;**48**:420P.
- 12 Statement by the British Thoracic Society, Research Unit of the Royal College of Physicians of London, King's Fund Centre, National Asthma Campaign. Guidelines for management of asthma in adults: I—Chronic persistent asthma. *Br Med J* 1990;**301**:651-3.
- 13 Statement by the British Thoracic Society, Research Unit of the Royal College of Physicians of London, King's Fund Centre, National Asthma Campaign. Guidelines for management of asthma in adults: II—Acute severe asthma. *Br Med J* 1990;**301**:797-800.
- 14 Department of Health. *Report on British confidential enquiries into maternal deaths in the UK 1985-7*. London: DoH, 1991.
- 15 Guidelines on the management of asthma. *Br Med J* 1993;**306**:776-82; *Thorax* 1993;**48**:S1-24.
- 16 Neville RG, Clark RG, Hoskins G, Smith B. National asthma attack audit 1991-2. *Br Med J* 1993;**306**:559-62.
- 17 Osman J, Ormerod LP, Stableforth DE. Management of acute asthma: a survey of hospital practice and comparison between thoracic and general physicians in Birmingham and Manchester. *Br J Dis Chest* 1987;**81**:232-41.
- 18 Baldwin DR, Ormerod LP, Mackay AD, Stableforth DE. Changes in hospital management of acute severe asthma by thoracic and general physicians in Birmingham and Manchester during 1978 and 1985. *Thorax* 1990;**45**:130-4.
- 19 Bucknall CE, Robertson C, Moran F, Stevenson RD. Differences in hospital asthma management. *Lancet* 1988;**i**:748-50.
- 20 Bucknall CE, Robertson C, Moran F, Stevenson RD. Improving management of asthma: closing the loop or progressing along the audit spiral? *Quality in Health Care* 1992;**1**:15-20.
- 21 Bell D, Layton AJ, Gabbay J. Use of a guideline based questionnaire to audit hospital care of acute asthma. *Br Med J* 1991;**302**:1440-3.
- 22 Pearson MG, Ryland I, Rudolph M, Harrison BDW. Discharge and follow-up of acute asthma. *Thorax* 1992;**47**:209P (abstract).
- 23 Jones K, General Practitioners in Asthma Group. Impact of an interest in asthma on prescribing costs in general practice. *Quality in Health Care* 1992;**1**:110-3.

Address for correspondence: Dr B D W Harrison, Department of Respiratory Medicine, West Norwich Hospital, Bowthorpe Road, Norwich NR2 3TU.