Management of asthma and the audit spiral

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Asthma management is often suboptimal. The reasons for this are many and varied and were well summarised by the authors of the British Thoracic Association's inquiry into asthma deaths in two regions of England, which found preventable factors to have occurred in 86% of deaths (box). The authors concluded that doctors, patients, and their relatives had often failed to realise the severity of the fatal attack.¹ Retrospective study is, of course, likely to draw conclusions such as these but it emphasises the fact that good management of asthma is a team effort.

Audit of asthma care

The work we have done at Glasgow Royal Infirmary has looked mainly at the doctor input to that effort and more specifically the hospital input. The parts that the patient, family, and general practice play are probably more important as only very few asthmatic patients are ever admitted to hospital with acute asthma. Nevertheless, getting the hospital management of asthma right may have important spin offs in terms of patient education and understanding and also in terms of good liaison between hospital and general practice.

Our interest was stimulated by observing deficiencies in the care of asthmatic patients

Preventable factors in asthma deaths¹

Corticosteroids and bronchodilators underprescribed
Inhaled steroids frequently not given
Patient cooperation satisfactory in 47%

seen as part of our routine clinical practice. We have now looked at the management of patients admitted with acute asthma over three time periods, each lasting a year: 1983, 1985-6, and 1989. The 1983² and 1989³ surveys were retrospective, the 1985-6 survey⁴ was prospective and entailed a follow up interview with patients as well as the case note review which was common to each survey period.

The 1985-6 survey was of central importance. In it patients with acute asthma, or wheezing illness if they were also non-smokers, were identified from day to day by contact with the admitting medical firms. They were contacted while in hospital, and if they agreed to participate they were given an appointment for about a fortnight after their discharge; on that occasion, in the patient's own home, a checklist of questions was completed in the course of a semistructured interview. The interview included details of past and current asthma history and also specific questions about symptoms of asthma since discharge. A further checklist was used to record details of asthma management in hospital from the patients' case notes. In all, 157 cases (81% of the total for that year) were followed up in this manner.

One of the ways in which the data could be analysed was to look at the management of patients admitted to two medical firms in the hospital which do not have a respiratory physician and compare them with two medical firms which do.⁵ This analysis depended on the fact that the two patient groups were similar in terms of age, previous asthma management and treatment, severity of the index attack, and certainty of diagnosis of asthma (table 1). It showed that despite this initial similarity the two groups were treated differently, with significantly more patients under the care of the medical teams with a respiratory physician being treated with oral corticosteroids, having their peak flow rate monitored (to provide an objective measurement of severity of asthma), and having their long term regular treatment (usually inhaled steroids) increased at the time of discharge from hospital. Also, significantly more of this group were followed up in the

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Table 1 Patient characteristics, 1985-6 prospective audit

	Medical firms including respiratory physician (n=64)	Medical firms with no respiratory physician (n=86)
Average (SD) age (years)	44(19)	51(20)
Diagnostic category:		
No (%) with good history with/without pulmonary function tests	49(77)	63(73)
No (%) with previous positive steroid trial	7(11)	11(13)
No (%) with "doubtful" history	8(12)	12(14)
No (%) smokers	20(31)	24(28)
No (%) taking steroids (any form) before admission	35(60)	55(64)
Mean (SD) No of previous admissions	3(8)	4(8)
Mean (SD) No of exacerbations of asthma in past year	4(5)	4(4)
Mean (SD) duration of exacerbation before admission (days)	5(5)	4(5)
Mean (SD) initial pulse rate (beats/min)	109(18)	111(21)

Table 2 Differences in hospital management, 1985-6. Figures are numbers (percentages) of patients

	Medical firms including respiratory physician (n=64)	Medical firms with no respiratory physician (n=86)
Given oral corticosteroids	53(83)	58(67)*
Peak flow rate measured	47(73)	36(42)**
Inhaler technique assessed	46(72)	45(52)*
Inhaled therapy increased on discharge	35(55)	24(28)**
Review planned within 2 weeks	58(91)	47(56)**
Reviewed within 2 weeks	21(33)	7(8)*

*p<0.05; **p<0.005.

Table 3 Differences in outcome, 1985-6. Figures are numbers (percentages) of patients

	Medical firms including respiratory physician	Medical firms with no respiratory physician
Two weeks after discharge:		
Sleep disturbance	15(23)	35(42)*
Morning chest tightness	24(37)	47(55)*
Wheeze on one flight of stairs	22(34)	51(58)**
By end of survey:		
Readmitted with acute asthma	1(2)	15(20)**

*p<0.05; **p<0.005.

outpatient clinic and, particularly, within a fortnight of discharge (table 2). These differences in care were crucially associated with differences in both short and long term outcome, as shown in table 3.

These data were presented at the hospital's weekly meeting and also to each of the individual medical firms in their internal weekly meetings. There was much discussion of the implications of the results, but guidelines were not produced at any stage.

In 1990 the opportunity arose to take this work forward, and a further retrospective survey of acute asthma cases seen in 1989 was

undertaken, using the same methods as for the previous (1983) retrospective survey. For comparison acute asthma cases from the prospective 1985-6 survey whose final discharge summary code was asthma were included in the analysis, and consisting of 85 out of 157 cases for 1985 (53%).³

The three patient groups were similar in terms of age and sex, length of hospital stay, and severity of the index attack. Many more in 1989 were already taking high dose inhaled corticosteroids at the time of admission to hospital, although in this retrospective survey no confirmation of compliance was possible. In terms of hospital management, significant improvements in care were seen in the most recent survey period, with more patients receiving oral corticosteroids (fig 1) having their peak flow measured initially and serially while in hospital (fig 2), and being discharged taking oral corticosteroids (fig 3). The only finding at variance with the general evidence of major improvements in care was the observation that significantly fewer patients had their inhaled corticosteroid dose increased

Fig 1 Treatment in hospital of patients with asthma (CS corticosteroids)³

Fig 2 Recording of peak flow rate in patients with asthma

Fig 3 Steroid treatment after discharge (CS corticosteroids)¹

at the time of discharge in 1989. However, this relates entirely to the fact that many more patients were already receiving high dose inhaled corticosteroids on admission so that further increasing the dose was difficult.³ Further assessment of the validity of this

observation entails looking at outcome and this is under way. This finding does, however, highlight the importance of adequate assessment of audit results obtained, which in turn requires careful thought at the start of an audit project to ensure that enough data are collected to be able to interpret the findings meaningfully.

Improved management

These findings are encouraging; the management of asthma in our hospital has significantly improved over the decade. It is, of course, fascinating to speculate on the reasons for this; we can discount any effect which the very valuable British Thoracic Society guidelines^{6,7} have had, as the changes described here occurred before their publication. Possible underlying reasons for this improvement in care include:

- The audit process and feedback of results
- The association of management details with outcome measures
- The use of opinion leaders – the respiratory physicians in the hospital⁸
- An underlying, more widespread improvement in asthma care which we have simply observed.

This last possibility is not sufficient to account for the improvement,³ and teasing out the other possible factors may well be impossible. However, good medical audit is likely to have elements of all these other factors, when groups of doctors take time to appraise critically part of their practice where they identify a problem.

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