

Do self-management plans reduce morbidity in patients with asthma?

G HOSKINS

R G NEVILLE

B SMITH

R A CLARK

SUMMARY

Background. Self-management plans may help patients with asthma intervene when symptoms deteriorate, thus preventing asthma attacks.

Aim. A study set out to test whether a self-management plan tailored to the circumstances of the individual reduces morbidity from asthma.

Method. General practitioners who had participated in a national audit of asthma attacks were randomized into intervention and control groups. Six months after the intervention group had issued self-management plans to patients with asthma, both groups of practitioners completed morbidity questionnaires on patients. Morbidity outcomes were compared for the 6-month periods before and after the issue of the plans.

Results. In the 6 months before the study, the 376 patients enrolled by the intervention group experienced higher levels of morbidity than the 530 patients for whom details were recorded by the control group. In the 6 months after the issue of the plans, control group patients showed little change in levels of morbidity, but intervention group patients showed significant reductions in hospital admissions, consultations for asthma symptoms, asthma review consultations, courses of oral steroids and use of emergency nebulized bronchodilators.

Conclusion. General practitioners appeared to operate 'enthusiast bias' and issued more self-management plans to patients with uncontrolled asthma. The reduction in morbidity in this group is probably a result of the use of the plans, but the verdict on whether plans reduce morbidity must be deemed 'not proven'.

Keywords: asthma; morbidity; self care; management of disease.

Introduction

THE prevalence and severity of asthma is increasing.¹ Despite modern treatment, many patients experience asthma attacks requiring emergency medical treatment and sometimes admission to hospital.² Most asthma attacks are preceded by an increase in symptoms or 'loss of control.'³ Thus, a window of opportunity exists where additional therapy may prevent worsening of symptoms and an asthma attack.

Self-management plans encourage patients to control their own disease, and thus prevent attacks.^{4,5} Previous work from individual general practices and hospital outpatient departments showed some evidence that self-management plans which blend educational material and therapeutic advice may reduce morbidity.⁶⁻¹⁴ The revised British Thoracic Society guidelines¹⁵ encourage the use of self-management plans and many general practices and hospital outpatient clinics routinely issue them to patients, despite the lack of published evidence of their effectiveness. Therefore, the aim of this study was to determine whether self-management plans reduce morbidity from asthma.

Method

Self-management plan

A three-step self-management plan consistent with British Thoracic Society guidelines¹⁵ was designed, piloted and developed. Patients were advised to use regular 'preventive' treatment when well (peak flow rate above 75% of best), 'step-up' treatment if symptoms developed or peak flow rate dropped to 50-75% of best, and to call for professional help and take emergency treatment if symptoms were severe or peak flow rate fell below 50% of best. Plans were colour coded (green for regular preventive treatment, amber for step-up treatment and red for emergency treatment) and tailored to individual circumstances; i.e. age, past history, trigger factors and local medical services.

Participants

In 1993, general practitioners in the UK who had participated in the second national audit of asthma attacks in 1992-1993 were randomized (1: 1) into intervention and control groups, using a predetermined random numbers sequence.¹⁶ General practitioners in the intervention group were invited to issue self-management plans personally to those patients who were known to have suffered an asthma attack in the past three months. The control group were simply asked to identify patients who had experienced an asthma attack in the past 3 months. Six months later, both groups of doctors were invited to complete a morbidity questionnaire for each patient recruited. These sought to determine whether or not patients had experienced the following in the 6-month periods before and after issue of the self-management plans: hospital admission as a result of an asthma attack; hospital accident and emergency department attendance owing to an asthma attack; patient initiated general practice consultation for asthma symptoms; general practice asthma review consultation; course of oral steroids for asthma; or use of emergency nebulized bronchodilator for asthma.

Analysis using the chi-square test of proportions was on an 'intention to treat' basis where outcome measures were compared before and after issue of the plans in each group; i.e. longitudinally and cross-sectionally. Odds ratios are quoted when they are significant at the $P < 0.05$ level; i.e. when the 95% confidence interval does not include 1.0. The recruitment target was for 100 general practitioners to enrol at least 500 patients.

Results

One hundred and thirty-nine practitioners were randomized to

G Hoskins, BSc, RGN, trial coordinator; R G Neville, MD, senior lecturer in general practice and project director; B Smith, project secretary and data processor; and R A Clark, FRCPE, consultant chest physician and project director, University of Dundee, on behalf of the general practitioners in asthma group.

Submitted: 14 April 1995; accepted: 16 August 1995.

© British Journal of General Practice, 1996, 46, 169-171.

the intervention group and 151 to the control group. Seventy-one general practitioners in the intervention group (51.1%) returned 453 patient questionnaires at the end of the 6-month period, of which 376 (83.0%) were usable (54 patients had left their practices, seven had died of causes unrelated to asthma in the previous six months and 16 questionnaires were incomplete). Eighty-eight control group practitioners (58.3%) returned 568 patient questionnaires, of which 530 (93.3%) were usable (35 patients had left and three had died).

Comparison of outcome measures in the 6 months before the issue of the self-management plans showed that patients enrolled by the intervention group general practitioners had experienced significantly more hospital admissions [odds ratio (OR) 2.1, 95% confidence interval (CI) 1.3–3.2], accident and emergency department attendances (OR 2.9, 95% CI 1.2–7.1), consultations for symptoms (OR 2.3, 95% CI 1.7–3.1), review consultations (OR 1.7, 95% CI 1.3–2.3), courses of oral steroids (OR 2.8, 95% CI 2.1–3.7) and emergency nebulizations (OR 2.8, 95% CI 2.0–4.0) than those patients enrolled by the control group (Table 1). The outcome measures recorded for the control group patients showed only minor differences between the 6 months before and after enrolment, the only significant difference being an increase in asthma review consultations (OR 0.2, 95% CI 0.2–0.3). Among the intervention group patients, there was a significant reduction in the following outcome measures after the issue of plans: hospital admissions (OR 2.7, 95% CI 1.6–4.7), consultations for symptoms (OR 2.1, 95% CI 1.5–2.9), review consultations (OR 0.5, 95% CI 0.3–0.6), courses of oral steroids (OR 2.0, 95% CI 1.5–2.7) and emergency nebulizations (OR 2.0, 95% CI 1.4–2.9). In the 6 months after issue of self-management plans, measures of morbidity among intervention group patients were comparable to those of control group patients (Table 1).

Discussion

A national study involving 159 general practitioners and 906 patients should give a clear verdict on whether or not self-management plans reduce morbidity from asthma. The intervention group patients showed a statistically significant and clinically impressive reduction in five of the six outcome measures, suggesting that the issue of a self-management plan, tailored to their individual therapeutic needs, was responsible.

However, closer inspection of the results shows that, despite randomization, the measures of patient morbidity in the intervention group before the issue of the self-management plans were much higher than in the control group. Chance alone is unlikely to explain this. A more plausible explanation is that general practitioners in the intervention group elected to issue plans to patients with uncontrolled asthma, rather than to all patients who were eligible to receive them. Control group practitioners, who

were not supplied with plans, are likely to have returned data from their eligible patients, regardless of the severity of the disease or whether symptoms were controlled.

It appears that many of the intervention group patients had poorly controlled asthma, and their symptoms and in turn morbidity were favourably influenced by general practitioner review and the issue and operation of a self-management plan. However, diseases characterized by relapses and remissions can exhibit a pattern of morbidity called 'regression to the mean'. Observation of a disease when in relapse, that is when symptoms are present, inevitably leads to an improvement in outcome as the natural phenomenon of remission occurs. If one assumes that intervention group general practitioners deliberately selected patients with more severe asthma, and the lower response rate for these doctors suggests they did, then it is likely that the results are confounded by regression to the mean.

The general practitioners who participated in this study were a self-selected group with an interest in audit. Participants are likely to have shown enthusiasm and commitment, and encouraged their patients to operate plans in an attempt to reduce morbidity. Previous published work on self-management plans in asthma has attracted a similar criticism of 'enthusiast bias'.^{6,7,10,12} Although enthusiast bias can be seen as a study design flaw, in this study, general practitioner enthusiasm appears to have benefited patient care. Perhaps practitioners have selectively targeted those patients with high morbidity.¹⁷

This study provides evidence that many patients when given a self-management plan by their general practitioner subsequently show a statistically significant and clinically important reduction in morbidity. Unfortunately, the evidence collected in this trial is compromised by enthusiast bias. Therefore, the verdict on self-management plans is 'not proven'. In the absence of proof, general practitioners will need to make up their own minds about whether to issue self-management plans to their patients.

References

- Clark TJH (ed). *The occurrence and cost of asthma*. Worthing: Cambridge Medical Publications, 1990.
- Neville RG, Clark RA, Hoskins G, Smith B for general practitioners in asthma group. National asthma attack audit 1991-92. *BMJ* 1993; **306**: 559-562.
- Kendrick AH, Higgs CMB, Whitfield MJ, Laslo G. Accuracy of perception of severity of asthma: patients treated in general practice. *BMJ* 1993; **307**: 422-424.
- Osman L, Abdalla M, Beattie J, *et al* on behalf of GRASSIC. Reducing hospital admission through computer supported education for asthma patients. *BMJ* 1994; **308**: 568-571.
- Partridge MR. Asthma: guided self management. *BMJ* 1994; **308**: 547-548.
- Maiman AL, Green LW, Gibson G, McKenzie EJ. Education for self-treatment by adult asthmatics. *JAMA* 1979; **241**: 1919-1922.

Table 1. Outcome measures in intervention and control groups 6 months before and after issue of self-management plans.

	Number of patients experiencing:					
	Hospital admission	Accident and emergency attendance	Consultation for symptoms	Asthma review consultation	Course of steroids	Emergency nebulization
<i>Intervention group (n = 376)</i>						
Six months before	57	18	282	207	194	111
Six months after	23	10	221	274	132	64
<i>Control group (n = 530)</i>						
Six months before	42	9	299	219	147	69
Six months after	36	8	279	398	175	79

n = total number of patients in group.

7. Fireman P, Friday GA, Gira C, *et al*. Teaching self management skills to asthmatic children and their parents in an ambulatory care setting. *Pediatrics* 1981; **68**: 341-347.
8. Hilton S, Sibbald B, Anderson HR, Feeling P. Controlled evaluation of the effects of patient education on asthma morbidity in general practice. *Lancet* 1986; **i**: 26-29.
9. Jenkinson D, Davison J, Jones S, Martin P. Comparison of effects of a self management booklet and audio cassette for patients with asthma. *BMJ* 1988; **297**: 267-270.
10. Beasley R, Cushley M, Holgate ST. A self management plan in the treatment of adult asthma. *Thorax* 1989; **44**: 200-204.
11. Sibbald B. Patient self care in acute asthma. *Thorax* 1989; **44**: 97-101.
12. Charlton I, Charlton G, Broomfield J, Mullee M. Evaluation of peak flow and symptom only self management plans for control of asthma in general practice. *BMJ* 1990; **301**: 1355-1359.
13. Charlton I, Antoniou AG, Atkinson J, *et al*. Asthma at the interface: bridging the gap between general practice and a district general hospital. *Arch Dis Child* 1994; **70**: 313-318.
14. Grampian asthma study of integrated care (GRASSIC). Effectiveness of routine self monitoring of peak flow in patients with asthma. *BMJ* 1994; **308**: 564-567.
15. British Thoracic Society, British Paediatric Association, research unit of the Royal College of Physicians of London, *et al*. Guidelines on the management of asthma. *Thorax* 1993; **48**: S1-S24.
16. Altman DG. *Practical statistics for medical research*. London: Chapman and Hall, 1993: 86.
17. Jones KP, Charlton IH, Middleton M, *et al*. Targeting asthma care in general practice using a morbidity index. *BMJ* 1992; **304**: 1353-1356.

Acknowledgements

We thank the general practitioners and patients who participated and colleagues who gave helpful criticism. The general practitioners in asthma group is supported by an educational grant from Allen and Hanburys Limited.

Address for correspondence

G Hoskins, Tayside Centre for General Practice, University of Dundee, Charleston Drive, Dundee DD2 4AD.

UNIVERSITY OF WESTMINSTER

Advance your understanding of health & community care

Are you interested in enhancing your career and improving patient care? If so, come to our introductory evening and learn more about our innovative part-time programmes for health care professionals.

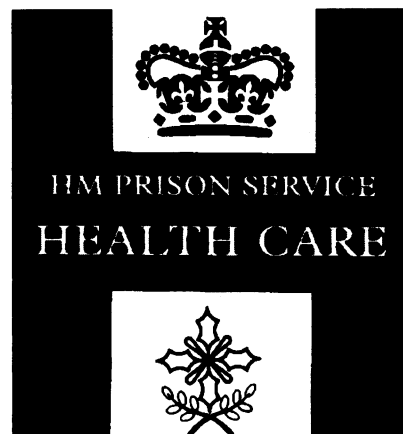
- MSc Evaluation of Clinical Practice**
- MA Continuing Professional Education**
- MSc General Practice and Primary Health**
- MA Community and Primary Health*
- MA in Community Development (funding available)
- MSc Complementary Therapy Studies*
- MA Therapeutic Bodywork*

* PGEA approved ** locum payments available

Introductory Evening Tuesday 23 April at 6.30pm

Contact the Centre for Community Care & Primary Health, 33 Queen Anne Street, London W1M 0JE. Telephone 0171 255 3550. Fax 0171 580 8169.

HEALTH CARE SERVICE FOR PRISONERS



The Service provides medical care for prisoners to a standard equivalent to that in the National Health Service, and employs over 250 doctors, both full time and part time.

A programme of training is provided which recognises the specialist nature of medical work in prisons to include management: the syllabus leads to the acquisition of a Diploma in Prison Medicine.

All facilities and equipment are provided and all employed doctors are indemnified by the Service. Prison medicine is a challenging and rewarding area of medical practice. Vacancies exist both for full time and part time posts in many parts of England and Wales.

Doctors who are interested are invited to write or speak to:

Dr Roy Burrows,
Directorate of Health Care,
Cleland House, Page Street,
London SW1P 4LN,
Tel: 0171-217 6550,
Fax: 0171-217 6412.