

# Outcome of asthmatics attending asthma clinics utilising self-management plans in general practice

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## ABSTRACT

**Objective:** To evaluate the effect of a general practice asthma clinic on morbidity, lifestyle and drug usage in patients with asthma and to compare the effect of providing written or verbal instructions.

**Setting:** An urban general practice in North Staffordshire.

**Method:** Patients registered with the practice, with a diagnosis of asthma, were invited to attend an asthma clinic. Those who met specified criteria were randomised to receive instructions on management of their asthma either verbally (n=25) or in written form (n=25). On three occasions, 3 months apart, peak flow diaries were reviewed, and patients were scored according to a system designed to measure aspects of morbidity, lifestyle and drug usage. Main outcome measures were changes in the scores before and after attendance at the asthma clinic.

**Results:** Differences in the outcome measures between the verbal and written groups could not be reliably determined because of the differences between the two groups from the outset. Scores for lifestyle, nocturnal symptoms, as required bronchodilator use, other additional medication use, and highest peak flow improved by over 50% in both groups. Highest peak flow improved by 103 and 70 l/min respectively. Peak flow variability scores showed a trend towards worsening, in contrast to other measures. Significantly more preventer medication was prescribed for each patient at the end of the study compared with the preceding period.

**Conclusions:** The use of general practice asthma clinics can reduce morbidity from asthma when existing control is poor. It is likely that this is a result of focusing attention of patients and health care professionals on basic management strategies.

outcome measures but the success of general practice asthma clinics is less well documented.

The study practice has two full-time partners and serves a typical urban population of 3,500 in North Staffordshire. A Disease Monitoring Register has been kept since June 1991, from which 176 asthmatics have been identified (prevalence of 5%). The objectives of this investigation were to determine if a general practice asthma clinic employing self-management plans improved morbidity, and if the use of written instructions improved the effectiveness.

## METHOD

Patients aged 17-74 years registered with the practice and with a diagnosis of asthma were selected for initial assessment. They were asked to attend a preliminary visit for an assessment by a general practitioner who had no further contact with the patients during the study period. A questionnaire was administered to obtain demographic details, current symptoms, drug use and detailed previous medical history. Peak expiratory flow (PEF) was determined using a Wright® peak flow meter. Patients were included if their PEF was less than 75% of the predicted value. Exclusion criteria were illiteracy, pregnancy, history of occupational asthma, chronic lung disease other than asthma and heart disease. The diagnosis of asthma was based on the detailed history and the presence of a PEF below 75% of the predicted value. All patients gave written informed consent. Twenty five of those were selected by random number generation to receive verbal instructions on asthma management and 25 to receive written instructions in the form of a management plan. They were instructed in the use of Mini-Wright® peak flow meters and asked to record their PEF twice daily before inhaler use. PEF technique was checked after two weeks by the practice nurse. After this period, patients returned to the asthma clinic for the first of three study visits, each three months apart, where assessment was made by another doctor, instructions given and PEF recorded. To avoid bias, the assessor was unaware of scores given at successive visits.

At each visit asthma information posters were displayed in the waiting room, objective assessment of inhaler technique was made on a five point scoring system, PEF technique was checked, and hand-outs were provided including a copy of 'Asthma in the family'.<sup>6</sup> Patients were encouraged to join the local branch of the National Asthma Campaign. Adjustments in treatment could be made at the consultation or in response to the action plan.

The medical records of the patients included in the study were examined for the 12 months prior to the study and for the subsequent 12 months study period. The number of home visits, emergency admissions or attendances at hospital for exacerbations of asthma were noted. Medication was recorded at the start and finish of the study period. The study was approved by the University of Keele Research Ethics Committee.

The scoring system was devised by the Midlands Thoracic Society to measure morbidity parameters and drug use.<sup>7</sup>

## INTRODUCTION

In the United Kingdom, the health needs of most asthmatics are met by primary care services. Optimal management is encouraged by adherence to national guidelines which can be adapted for local use.<sup>1,2</sup> These local guidelines have been shown to be as clinically effective as conventional hospital outpatient clinics, and to be acceptable to patients, general practitioners and consultants.<sup>3</sup> The general practice asthma clinic is a logical forum for delivery of such care, including the provision of a close relationship between patient and health care professionals, and these clinics are encouraged by current government directives. Hospital-based management protocols<sup>3,5</sup> have been shown to improve

**Table 1: Characteristics of study population**

	Verbal No. (%)	Written No. (%)
Male	10 (40)	13 (52)
Age		
17-39	11 (44)	15 (60)
40-59	9 (36)	7 (28)
60-70	5 (20)	3 (12)
Non-smoker	15 (60)	13 (52)
Ex-smoker	6 (24)	9 (36)
Current smoker	4 (16)	3 (12)

## RESULTS

The characteristics of the study population are shown in Table 1. No significant differences were shown for age, sex or smoking history.

Within group comparisons for successive visits were analysed with the paired t test and between group comparisons with Student's t test, and  $\chi^2$  as appropriate.

**Between visit comparison**

For both groups marked improvements in scores and measurements were noted with the exception of peak flow variability, which was shown to be low at the outset (Table 2).

**Between group comparison**

At randomisation there were significant differences between the two groups. The verbal instruction group were generally more severely affected by their asthma in that they had higher morbidity scores and higher drug usage scores than the written instruction group. This was true for visit 1 and 2, but by visit 3 most differences no longer reached significance, and total scores were the same. The magnitude of improvement in scores from visit 1 to visit 3 was significantly greater in the verbal group (Table 2).

Seven of the 50 patients required admission, emergency attendance or home visits during the year prior to the study compared with four during the study (no significant difference).

**Medication before and after the study period**

Table 3 shows total doses of medication for each class of drug for the two groups of patients. Significantly more preventer drugs and less oral bronchodilators were prescribed by the end of the study.

## DISCUSSION

It is essential to show that new approaches to the management of diseases, such as asthma, are both appropriate and effective. The use of general practice asthma clinics is both a relatively new approach and a logical consequence of government directives encouraging management of patients in the community. General practice clinics allow implementation of a variety of management options such as education, shared care and self-management plans. Although many exist, only limited numbers of general practice asthma clinics have been formally evaluated.<sup>8-10</sup> Other education programmes have had favourable effects on morbidity in general practice but most were either run by hospital departments or heavily involved the hospital in shared care protocols.<sup>5, 8, 11</sup>

The study was designed to look at a population likely to reflect that commonly encountered by many general practitioners in the United Kingdom. The prevalence of asthma of 5% is similar to that derived from national statistics.<sup>12</sup> The dramatic improvement in morbidity scores emphasises the effectiveness and importance of the implementation of structured management, which is best

**Table 2: Lung function parameters and scores (a lower score denotes an improvement)**

Parameter	Visit 1		Visit 3		Differences Visit 1-3			
	Verbal	Written	Verbal	Written	Verbal	p value	Written	p value
Highest PEF (l/min)	350	335	452	406	102	< 0.001	70	< 0.001
PEF variability (%)	7.9	8.9	8.2	9.1	0.33	0.748	0.46	0.675
<b>Scoring system</b>								
Highest PEF score	2.92	2.04	0.84	0.96	-2.08	< 0.001	-1.08	< 0.001
PEF variability score	0.24	0.36	0.40	0.52	0.16	0.256	0.20	0.260
Bronchodilator use	1.88	1.24	0.64	0.52	-1.24	< 0.001	-0.72	< 0.001
Nocturnal symptoms	2.40	1.76	0.72	0.44	-1.86	< 0.001	-1.32	< 0.001
Lifestyle	1.80	1.72	0.52	0.72	-1.28	< 0.001	-1.00	< 0.001
Additional medication	2.16	1.40	0.16	0.44	-2.00	< 0.001	-0.96	< 0.001
<b>Total score</b>	<b>11.4</b>	<b>8.52</b>	<b>3.28</b>	<b>6.60</b>	<b>8.12</b>	<b>&lt; 0.001</b>	<b>4.92</b>	<b>&lt; 0.001</b>

**Table 3: Medication before and after study period**

$\chi^2$  tests: verbal before vs after  $\chi^2 = 31.3$ ,  $p = 0.001$ ; written before vs after  $\chi^2 = 37.5$ ,  $p = < 0.001$

Class of medication	No. (%) of subjects on specified medication				95% CI of difference in proportions before vs after study	
	Before study		After study		Verbal	Written
Inhaled B2-agonist	6 (24)	9 (36)	25 (100)	25 (100)	49.20 to 76.00	37.60 to 64.0
Inhaled anticholinergic	4 (16)	6 (24)	14 (56)	12 (48)	15.30 to 40.00	-9.07 to 46.6
Mast cell stabiliser	4 (16)	1 (4)	3 (12)	8 (32)	-22.50 to 17.70	5.06 to 28.0
Inhaled steroid	8 (32)	5 (20)	19 (76)	11 (44)	8.94 to 62.80	-4.49 to 38.0
Inhaled preventer	12 (48)	6 (24)	22 (88)	19 (76)	11.10 to 47.80	26.30 to 52.0
Oral B2-agonist	9 (36)	11 (44)	0	0	-36.00 to 11.80	-44.00 to -18.9
Theophylline	22 (88)	22 (88)	13 (52)	9 (36)	-54.80 to 2.29	-59.80 to -21.7

catered for in a general practice asthma clinic. Important factors in the improvement are undoubtedly the selection criterion of a PEF of less than 75% of the predicted value and the change in the use of preventer medication. The initial local prescribing practice may heavily influence the findings of asthma clinic evaluations since patients on adequate doses of preventer treatment may show a less marked response. The high proportion of our patients on oral theophylline rather than preventers exemplifies this. However, our patients were easily identified over a three month period and furthermore represented over a quarter of all the asthmatics registered with the practice. It is likely that other general practices have many patients in the same category who should respond in a similar way. This study was too small to demonstrate an effect on hospital admission but larger studies have shown marked reductions in hospital attendance.<sup>4</sup>

The comparison between the mode of delivery of self-management instructions was flawed by the differences between the verbal and written groups at the outset. This was despite careful attention to the randomisation process. However, the scores improved more in the verbal group than in the written group between visits 1 and 3. These differences could be accounted for by the greater scope for improvement in the verbal group.

PEF variability did not reflect control of asthma in this population, as it failed to improve in groups of patients who had major improvements in important measures of morbidity. Highest PEF did improve in these groups but this may be influenced by other factors, including learning effect and use of bronchodilators. The scoring system may be appropriate for the evaluation of other intervention programmes in asthma. Except for PEF variability, scores for individual parameters changed by a similar magnitude indicating a balanced contribution to the total score.

The results of this study have clearly shown that the introduction of an asthma clinic to a general practice, typical of a number of practices in the UK, can have an impact on the morbidity of over a quarter of asthmatics. This may be largely attributable to implementation of appropriate prescribing, which itself may be a consequence of a research-oriented attitude amongst health care professionals and patients. The overall effect argues strongly in favour of introducing asthma clinics in all general practices. The differences produced by giving instructions verbally or in written forms if present, are relatively small.

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## Letter to the Editor

### Glaucoma and asthma in the elderly

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In a recent report Levy<sup>1</sup> suggested developing a protocol for screening undiagnosed asthma in elderly patients. Such a protocol might include screening patients who have glaucoma and are treated with topical non-selective beta blockers such as timolol maleate. This medication is widely used because it is a convenient twice-daily dosage and has few ocular side-effects.

Evidence to support this comes from two studies reported by Diggory *et al.*<sup>2,3</sup> They recruited 51 elderly glaucoma patients with no previous history of asthma or chronic obstructive pulmonary disease, who were using topical timolol maleate to control intra-ocular pressure. In their first study their aim was to find the extent of unrecognised impairment of lung function tests among elderly patients already using timolol maleate. To do this they recruited patients who, after having lung function tests, were randomly allocated to receive either pilocarpine or betaxolol (cardio-selective beta blocker). They also had a control group of 20 patients recruited from the same clinic to exclude any learning effects with the use of the spirometer. There were significant improvements in lung function tests of peak expiratory flow, FEV<sub>1</sub> and FVC after a four week period. There was no corresponding improvement in lung function tests in the control group. The authors concluded that non-selective beta blockade impaired lung function in these elderly patients.

The objective of their second study was to find a simple method based on respiratory symptoms obtained by direct questioning and the response to inhalation of  $\beta_2$ -agonists to identify those patients experiencing significant air flow obstruction. They discovered that patients who had exertional dyspnoea, cough with sputum, a 15% improvement in all lung function tests after nebulised salbutamol and those patients with raised dyspnoea scores (based on patients comparing themselves with others of their own age and reporting how breathless they felt when undertaking activities of daily living), were likely to demonstrate clinically significant broncho-spasm with an 89% specificity and a 74% sensitivity.

These studies were done on patients with no past history of asthma or COPD. The benefit from including patients with such past medical histories would be higher and justify their screening for asthma. ■

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