

# Proactive, nurse-run asthma care in general practice reduces asthma morbidity: scientific fact or medical assumption?

K P JONES

M A MULLEE

**SUMMARY.** Nurse-run asthma care in general practice in the United Kingdom has become extremely common, particularly since the introduction of the 1990 contract for general practitioners, but there have been few controlled trials of the clinical effectiveness of this approach to asthma care. A study attempted to compare the outcome of asthma care over three years in two similar practices when one practice provided proactive, nurse-run care and the second continued with a traditional (reactive) approach, and to examine the process of care when such changes were introduced. Despite the investment of considerable resources, statistically significant differences could not be shown between the two practices using a comprehensive variety of outcome measures. This could be interpreted as meaning that nurse-run asthma care may be ineffective, but the negative outcome is much more likely to reflect difficulties in the manner in which the intervention practice sought to develop its service and in the research process. There were extensive methodological problems leading to a potential type 2 error. A randomized controlled trial of nurse-run asthma care would now be difficult to conduct, and so it may be necessary to accept nurse-run asthma care without definitive proof of its clinical effectiveness.

**Keywords:** asthma; general practitioner clinics; outcome; skill mix; practice nurses.

## Introduction

THE emergence of practice nurses as professionals in their own right has been a welcome innovation in primary care,<sup>1,2</sup> but few formal studies have examined the extended role of practice nurses in asthma care. First discussed in the United Kingdom literature in 1985 by Barnes,<sup>3</sup> nurse-run asthma clinics have proliferated,<sup>4</sup> particularly since the introduction of the 1990 contract for general practitioners.<sup>5</sup> Clear guidelines for such clinics have been stated<sup>6,7</sup> and several authors have reported their own experiences of these clinics.<sup>8,9</sup>

Proactive care of asthma has been shown to improve outcomes in the hospital setting,<sup>10</sup> but there have been few scientifically adequate studies in UK general practice. Charlton and colleagues conducted a 12-month follow up of 115 patients taking prophylactic asthma therapy who attended a nurse-run asthma clinic.<sup>11</sup> The number of general practitioner consultations for these patients decreased in the following year, and there were statistically significant reductions in the numbers of oral steroid courses pre-

scribed, of acute nebulizations and of days lost from work or school. Results were similar in adults and children. The study has been extensively cited in the literature; it was, however, uncontrolled and was carried out in the general practice of an enthusiast. Hayward and colleagues conducted a randomized controlled one-year study of patient self-management in a general practice, nurse-run asthma clinic in London.<sup>12</sup> Twenty three patients visited the nurse-run asthma clinic monthly while 19 acted as controls. The nurse-run clinic patients successfully self-treated episodes of asthma more frequently than the control patients, but there was no statistically significant difference between the groups in reported symptoms, days lost from work or school, or consultations. In an audit of an asthma clinic in a Derbyshire general practice, Martys concluded that better recording of relevant data had occurred but that objective improvement in patients' asthma could not be detected.<sup>13</sup> This body of evidence seems insufficient to sustain academically the existing wide network of nurse-run asthma clinics in general practice.

A prospective study aimed to compare the outcome of asthma care in two similar practices when one practice provided proactive, nurse-run care for asthma and the other continued with a traditional (reactive) approach to the disease and thus acted as a control. The process of asthma care when such changes were introduced was also examined. The trial proved inconclusive, despite considerable effort by both research and practice teams, and so the difficulties of conducting and evaluating this sort of pragmatic research were explored.

## Summary of study methods

Two general practices in the Southampton area were chosen and a sample of 100 asthmatic patients aged five to 65 years were selected from the computerized repeat prescribing registers of each practice. The practices were well matched with respect to their practice populations and practice staffing. Data from an interviewer-administered questionnaire, measurements of lung function (including week-long home peak flow diaries), and extracts from case records were collected in three phases: phase one — before a 12-month period of facilitation in the intervention practice; phase two — at the end of this facilitation period; and phase three — 12 months after phase two. Phases one, two and three took place from February to May 1988, from June to December 1989 and from November 1990 to February 1991, respectively. The major outcome assessments were of lung function, self-reported morbidity, use of medical resources and patients' attitudes to asthma. Attitudes to asthma were measured using Sibbald's stigma score.<sup>14</sup>

Five aims were set for the 12-month facilitation process: to establish an asthma register; to agree a therapeutic plan for the management of asthma; to develop a 'call' system to contact asthmatic patients for assessment and follow up by practice nurses; to define staff roles; and to allow practice nurses to develop expertise in asthma management. K J and a research nurse acted as resource persons via meetings with the whole team and smaller group sessions as required. At the end of the facilitation period, all members of the practice team were interviewed confidentially about their feelings towards the project and how successful it had been.

K P Jones, MA, DM, MRCP, senior lecturer, Primary Medical Care Group, University of Southampton. M A Mullee, BSc, MSc, CStat, senior statistical programmer, Department of Medical Statistics and Computing, University of Southampton.

Submitted: 11 October 1993; accepted: 17 October 1994.

© British Journal of General Practice, 1995, 45, 497-499.

## Summary of results

### Outcomes

Seventy one patients from the intervention practice and 70 patients from the control practice completed all three phases. Study patients were similar in the two practices with respect to age, sex, social class and age at onset of asthma. Considering phases two and three together, of the 71 patients in the intervention group, only 33 patients (46.5%) received at least one nurse consultation for asthma during the study period. In the control group, about 40% of patients had a nurse consultation for peak expiratory flow rate measurement in the year before their phase one interview; the corresponding figure for phases two and three combined was 30 of 70 patients (42.9%).

Improvement in peak expiratory flow rate as a percentage of the predicted rate was seen over time among the patients from both groups (intervention group from 82% to 91%, chi square = 15.4, 40 degrees of freedom (df),  $P < 0.001$ ; control group from 80% to 95%,  $\chi^2 = 8.8$ , 43 df,  $P < 0.05$ ), but there was no significant difference between the groups. In the control group, there was a statistically significant improvement between phases in response category to the question 'How often does asthma interrupt your daily activities?' but not to three other morbidity questions. In the intervention group, there was a statistically significant decrease between phases in total general practitioner consultations per year (from a median of four (interquartile range 3–7) in phase one to a median of three (1–5) in both phases two and three) but not in asthma-specific consultations. There was an increase over time in the number of patients in the intervention group whose peak expiratory flow rate had been recorded in the year before each interview. There was a statistically significant improvement between phases in patients' attitudes to asthma in the intervention group but not in the control group.

The proportion of patients who were taking anti-inflammatory drugs was statistically significantly higher in the control group than in the intervention group at all phases. Of the 71 patients in the intervention group, 44 patients (62.0%) were taking such medication at phase one, 47 (66.2%) at phase two and 48 (67.6%) at phase three. Of the 70 patients in the control group, 58 patients (82.9%) were taking such medication at phase one, 59 (84.3%) at phase two and 60 (85.7%) at phase three. However, no trends over time were evident in either group. No other statistical significant differences were found.

### Process

The administrative costs of letters to patients and of new forms for the notes were quite small. In total the nurses estimated that they worked five extra hours per week, which incurred a considerable financial cost (approximately £40 per week in total at the time of the study). The nurses demonstrated considerable enthusiasm from the start but reported that their time was under pressure, with 'very little thinking time'. Reception staff were given extra work with the computer, building the register and generating 'call' letters, and with an increase in telephone enquiries from patients participating in the study.

## Discussion

Investment of resources and nurse time in asthma care must surely be beneficial for patients, but this study of such investments was unable to demonstrate differential improvements in overall asthma morbidity. This result at first sight seems extremely disappointing and of great importance against the current thrust of proactive asthma care in general practice. However, it is not possible to generalize with confidence from the study data for several important methodological reasons.

### *Was the study powerful enough to detect change?*

The study took more than three years to conduct and required a large amount of resources and energy, but its conclusions have to be tempered by the fact that it was a single practice pair comparison. The cohort of patients interviewed in the intervention study was not given priority for review by the practice team. This meant that a considerable number of people with asthma who were registered with the intervention practice but not within the study sample, especially in the age group four to eight years which the nurses chose to focus on, could have received nurse-run care and markedly improved without the study methods allowing this to be detected. Thirty per cent of the 200 patients in the original study sample from both practices dropped out during the project, mainly through patients moving away. Only 46% of those who completed the three phases actually received nurse-run asthma care during the project. Some patients perhaps did not wish to receive such care, despite receiving an invitation, but others did not have the chance to receive nurse-run care. This was caused by the arrangements for calling asthma patients taking time to evolve.

In addition, although there was an agreed written management plan for asthma in the intervention practice and the timing of assessments and follow ups by nurses was clear, the content of nurse-run care was probably insufficiently defined and no measures of progress in nurses' knowledge of asthma management were made. Furthermore, the nurses had protected time for asthma care but this was within regular treatment room sessions rather than in discrete clinics.

It is thus likely that a type 2 error prevented the detection of statistically significant differences in outcome, that is, because of the small sample size, no difference was detected when a true difference was present. A considerably larger study, involving more patients from more practices, would have been helpful to obviate these problems, but the amount of resources required for such an undertaking using this methodology is prohibitive. Furthermore, a definitive randomized controlled trial may be almost impossible to conduct, especially as suitable control practices would now be difficult to find and some might consider such a process unethical.

### *Was the control practice a proper control?*

No proactive measures were instigated in the control practice during the project, but the method of recording the issue of repeat prescriptions to asthmatic patients was changed after difficulty was experienced in interpreting the computer data. The possibility of improving care in the control group merely because of scrutiny must not be discounted. The recalling of some patients in the control practice for peak flow measurement before the project could be seen as invalidating its status as a control. In addition, significantly more patients in the control group were on anti-inflammatory drugs at all phases of the study. It would perhaps have been better if less well advanced practices had been chosen for the study, but gaining cooperation from such practices is often difficult.

### *Was there scope for reducing asthma morbidity?*

The patients from both practices had mild asthma, with peak expiratory flow rates as a percentage of the predicted rate being 80% or more at all phases. There was therefore only a limited scope for significant reductions in asthma morbidity to be brought about.

### *Were the practices ready to change?*

The intervention practice team involved in this work had by definition expressed an internal wish for change in their clinical

asthma care, but the lack of involvement in the project felt by the reception staff (which emerged from the confidential interviews) may have exerted some 'unaware wrecking power' as discussed by Spiegel and colleagues.<sup>15</sup> It is important to note that this attempt to improve just one area of clinical practice at one time not only involved a considerable investment of resources and enthusiasm but also took six months for the new system to actually start.

### *Does nurse-run asthma care work?*

This study does not allow this question to be answered. A definitive answer is urgently needed in view of the resources currently being expended on proactive, nurse-run asthma care in general practice.<sup>4</sup> Providing extra care for patients with asthma because it is assumed to be beneficial or because other practices are doing it, rather than because it is of proven benefit, is a potentially wasteful process.

Innovative and well-resourced practice teams can perhaps provide good asthma care without any facilitation. Furthermore, gradual reductions in asthma morbidity could occur independently of a proactive contribution from primary care. For example, if asthmatic patients' awareness of asthma is raised by the media, they might have greater motivation to seek opportunistic advice from their primary health carers, and so improve their health within a reactive framework of general practice.

### **Future research needs**

Conducting a conclusive, formal randomized controlled trial — the gold standard of quantitative evaluations — of nurse-run asthma care in general practice may be almost impossible in the current climate of enthusiasm for proactive care, especially as such a trial would require a considerable number of patients in a sizeable series of practices. However, other strategies may be possible. Observational studies including large-scale audit with a consistent and carefully evaluated methodology might provide the necessary confirmation of effectiveness. Another potentially more useful approach would be to use qualitative key informant (patient) interviews and/or patient focus groups to evaluate patients' perceptions of proactive asthma care.

### **Conclusion**

The results of this study bring a note of caution into the planning of proactive care for patients with asthma and other chronic diseases. This study has not proved that nurse-run asthma care is effective or ineffective, but it has illustrated that benefits in lowered morbidity for patients in a practice are not immediate nor easy to achieve or demonstrate. Pragmatic action research of this type is difficult to conduct, but more attempts are necessary. The assumption that providing extra nursing time and care for people with asthma is beneficial to the practice population with asthma remains unproven. Nurse-run asthma care is an established and valued part of general practice, but providing scientific facts to prove that it is beneficial and effective will be difficult.

### **References**

1. Ross AK. Lessons learned from a course for practice nurses. *BMJ* 1981; **283**: 413-415.
2. Greenfield S, Stilwell B, Drury M. Practice nurses: social and occupational characteristics. *J R Coll Gen Pract* 1987; **37**: 341-345.
3. Barnes G. Nurse-run asthma clinics in general practice [letter]. *J R Coll Gen Pract* 1985; **35**: 447.
4. Barnes G, Partridge MR on behalf of the organization of care working group of the National Asthma Task Force. Community asthma clinics: 1993 survey of primary care by the National Asthma Task Force. *Qual Health Care* 1994; **3**: 133-136.
5. Department of Health and the Welsh Office. *General practice in the National Health Service: a new contract*. London: HMSO, 1989.

6. Pearson R. The case for asthma clinics in general practice. *Mod Med* 1988; **33**: 125-128.
7. Pearson R. *Asthma management in primary care*. Oxford: Radcliffe Medical Press, 1990.
8. Colebrook M. Delivery of care to the patient with asthma. *Respir Dis Pract* 1988; **5**: 21-26.
9. Sheppard J. How one practice benefits from a nurse-run asthma clinic. *Mod Med* 1988; **33**: 589-594.
10. Zeiger RS, Heller S, Mellon MH, *et al*. Facilitated referral to asthma specialist reduces relapses in asthma emergency room visits. *J Allergy Clin Immunol* 1991; **87**: 1160-1168.
11. Charlton IC, Charlton G, Broomfield J, Mullee MA. Audit of the effect of a nurse run asthma clinic on workload and patient morbidity in a general practice. *Br J Gen Pract* 1991; **41**: 227-231.
12. Hayward SA, Jordan M, Golden G, Levy M. A nurse run asthma clinic: assessment of patient self treatment for asthma. *Thorax* 1992; **47**: 238P.
13. Martys CR. Asthma care in Darley Dale: general practitioner audit. *BMJ* 1992; **304**: 758-760.
14. Sibbald B. Patient self care in acute asthma. *Thorax* 1989; **44**: 97-101.
15. Spiegel N, Murphy E, Kinmonth A-L, *et al*. Managing change in general practice: a step by step guide. *BMJ* 1992; **304**: 231-234.

### **Acknowledgements**

We thank Drs Mike Campbell and Bonnie Sibbald for their assistance in the initial design of this study; Professor John Bain for his advice and backing; Marianne Middleton for her work as research nurse and interviewer; Professors Ann-Louise Kinmonth and Raj Bhopal for their comments on the manuscript; and all the staff of the two practices for their enthusiasm, support and courtesy throughout the project. K J was a Sir Jules Thorn research fellow during this work and the project was also supported by the Wessex Medical Trust and the Wolfson Foundation. The spirometers were bought with a grant from the British Lung Foundation and the mini-Wright peak flow meters were donated by Clement Clarke International Limited.

### **Address for correspondence**

Dr K P Jones, Department of Primary Health Care, School of Health Care Sciences, University of Newcastle, The Medical School, Framlington Place, Newcastle upon Tyne NE2 4HH.

## SALES OFFICE

### **Asthma in practice**

Asthma in one of the most important chronic diseases in the United Kingdom today and its early diagnosis and effective management remains one of the great challenges for general practice. The authors provide comprehensive information on all aspects of diagnosis and control. Topics include: management in children and adults; the role of the practice nurse; asthma and medical audit.

Price £12.50 (£13.75 non-members)

### **Asthma record card**

This new RCGP card has been designed to provide a single record that includes a detailed initial assessment and follow up record. The data collected at follow up consultations is appropriate for a nurse run asthma clinic and the presence of this asthma card will allow details from both doctors and nurses to be recorded together.

Price £8.75 per 100 plus postage and packing.

*All these are available from RCGP Sales,  
14 Princes Gate, Hyde Park, London SW7 1PU.  
Tel: 0171-823-9698. Access and Visa welcome, 24 hour  
answerphone 0171-225-3048.*