

Identifying asthmatic patients in the community: a new method

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SUMMARY. *Identifying a random sample of patients in the community has long proved problematic. In 1989 changes were made in the management of adult asthmatic patients referred to specialist clinics in the Grampian Health Board area. In order to estimate the effect of these changes on the management of patients not referred, it was necessary to identify two random samples of adult asthmatic patients treated solely in general practice. As it was felt that existing methods were open to bias and other errors, a method using National Health Service drug prescription forms was devised. Following the computerization of the Pharmacy Practice Division in Aberdeen, a similar method for the identification of a follow-up sample had to be devised. Nearly 400 general practitioners (86% of those eligible) took part in the first sampling in 1989; 96% of those contacted participated in the second sampling in 1991. Both methods were effective in identifying asthmatic patients in the community. Computerization has made the task simpler, less time consuming and, as a consequence, more cost effective.*

Keywords: *asthma; clinical trials; research methodology.*

Introduction

THIS paper focuses on the specific problem of identifying random samples of patients with asthma normally treated in the community. The issue arose because random samples of adult asthmatic patients treated by their general practitioners without referral to a hospital consultant were required as part of an evaluation of changes in outpatient management for adult asthmatic patients which were implemented in the Grampian Health Board area in 1989. The changes in outpatient management were the introduction of shared care, enhanced education and peak flow self-monitoring.¹ To estimate the effect of the interventions in outpatient care on patients treated solely in general practice, postal surveys were undertaken in 1989 and 1991, immediately before and two years after the changes were introduced. The surveys were conducted both in the Grampian Health Board area, where these changes were made, and in the Highland Health Board area, where they were not. Thus, the basic design was that of a controlled before and after investigation.²

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Much previous research has concentrated on asthmatic patients who attend hospital clinics, as they are easily identifiable.^{3,4} Such patients are not, however, representative of asthmatic patients treated exclusively by their general practitioners, since those who have been referred to a consultant tend to have asthma that is either more severe, or more difficult to treat. Other studies have focused on the patients of particular general practitioners⁵⁻⁷ or particular general practices.⁸⁻¹⁰ These patients are usually identified in one of three ways; through practitioners' disease registers,^{5,9} from repeat prescription records,^{6,9} or by asking practitioners to identify a sample of asthmatic patients.^{7,8} However, there is a danger that the patients of selected practitioners may not be representative of asthmatic patients in general. Another method of identifying asthmatic patients in the community is to send screening questionnaires to a sample of the general population.¹⁰⁻¹³ This method is costly, as the prevalence of diagnosed asthmatic among the general population is thought to be around 5%.¹⁴ It is also open to false positive and false negative errors: some asthmatic patients fail to respond appropriately, while others falsely imply that they have asthma.

The present study required a method which minimized bias and error. In 1989, therefore, a means was devised using the National Health Service drug prescription forms (GP10 forms) written by general practitioners for each drug preparation prescribed. In order for the dispensing contractor to be paid for the drug preparations, all GP10 forms are sent for pricing to the Pharmacy Practice Division (formerly known as the Prescription Pricing Division) of the Common Services Agency of the National Health Service in Scotland. In 1989 pricing was carried out manually in Aberdeen for prescriptions from the Grampian and Highland Health Board areas. However, the pricing of prescriptions became fully computerized in 1990. It was therefore necessary to devise a different, but comparable method, for selecting the second sample of patients in 1991.

Method

Approval for the study was sought from the ethical committees and general practice subcommittees of Grampian and Highland Health Boards. The area pharmaceutical committees of both health boards were informed of the study. The Pharmacy Practice Division then gave permission for the use of GP10 forms to identify possible asthmatic patients.

Patient characteristics

For inclusion in the sample patients were required to have been diagnosed as having asthma (defined as having airways obstruction which varies with time and treatment with a bronchodilator or steroid), to be aged 16-60 years and not to have attended a hospital clinic for the care of asthma in the previous year. The number of patients selected from any given household was restricted to one.

Sample design

Two sampling exercises were necessary. In 1989 the aim was to identify 1000 patients in the Grampian Health Board area and 500 in the Highland Health Board area, as the latter has less than half the population of Grampian. In 1991, a further 1000 Grampian and 500 Highland patients were needed. In order to

monitor changes in individuals over the two year period, as well as creating two representative samples giving a general view of any changes, an interlocking sample design was used: one third of the patients in the second sample were derived from the first.

Drawing the first sample

Between May and July 1989 each of the principals in general practice in the Grampian and Highland Health Board areas was asked by post for permission to use the GP10 forms they had written in June 1988 to identify patients who might have asthma. For each principal who agreed, the relevant bundle of GP10 forms was acquired from the Pharmacy Practice Division in Glasgow, where they were normally stored. June 1988 was chosen because this was a 'prescribing month' for the Pharmacy Practice Division. In prescribing months, statistics on prescribing by individual general practitioners were produced, and prescriptions were filed by practitioner rather than by dispensing contractor.

To achieve the necessary sample sizes, it was calculated that six patients from each practitioner's set of GP10 forms should be identified. This was achieved by looking for patients who had been prescribed drugs that are often used for asthma: bronchodilators, inhaled corticosteroids and drugs used for the prophylaxis of asthma. Patients who were identified by the GP10 form as not of working age (less than 16 years or over 60 years for women or 65 years for men) were eliminated and no more than one patient from any given household was included.

There was some evidence that the GP10 forms were not randomly ordered but sorted according to pharmaceutical contractor, so a form of stratified sampling was introduced¹⁵ by dividing the bundle for each principal into six approximately equal sub-bundles; each sub-bundle was then searched for one potential asthmatic patient, starting each search from a random point. However, for some principals (mainly those who worked part-time or had small lists of patients) the entire bundle of GP10 forms had to be searched in an attempt to identify six suitable patients.

Each list of patients was then sent to the relevant principal with the request that he or she should confirm that the patients were aged between 16 years and 60 years, suffered from asthma according to the definition given above, and had not attended an outpatient clinic during the past 12 months for the care of asthma. Principals were asked to return their lists once they had deleted the names of patients who were unsuitable for inclusion in the study. Two written reminders were sent if necessary, at three week intervals.

Drawing the second sample

Between May and July 1991 each of the principals who had participated in the study in 1989, and all new principals, were contacted by post to ask for their permission to use the GP10 forms they had written in June 1990 to identify possible asthmatic patients.

Since computerization, all the prescriptions for Grampian and Highland Health Boards are retained at the Pharmacy Practice Division in Aberdeen for a period of 12 months. They are stored in bundles according to dispensing contractor; each prescription has a unique number within the bundle and can be easily extracted.

The Pharmacy Practice Division in Edinburgh agreed to list all prescriptions written in June 1990 for *British national formulary* categories 3.1 (bronchodilators), 3.2 (corticosteroids) and 3.3 (cromoglycate and related therapy).¹⁶ The list was produced with general practitioners' names at the top of their prescriptions; only prescriptions written by those principals who had agreed to help

were extracted. A random sample of patients was then selected for each principal. In accordance with the interlocking sample design, one third of the patients in the 1991 survey were selected from those who had replied to the 1989 survey (approximately two per general practitioner), and two thirds were newly selected (approximately four per practitioner). Lists of up to six patients were sent to the relevant principal in the same way as in 1989, for confirmation that the patients were suitable for the study.

Results

The first sample

In 1989, the total number of principals in the Grampian Health Board area was 304, but nine were excluded from the study, comprising those working in restricted practices (for example, the student health service) and those in the practice used earlier for a pilot study (Table 1). Of the remaining 295 principals eligible for the study, 268 (91%) gave permission for their GP10 forms to be used for identifying asthmatic patients; annotated lists of patients were returned by all but three general practitioners. The 265 returned lists identified a total of 940 asthmatic patients in the Grampian Health Board area. Each patient was sent a questionnaire. Forty four questionnaires were returned by the Post Office as the addressees had 'gone away' or were 'not known.' Of the remaining 896, 769 were returned, a response rate of 86%.

Of 151 principals in the Highland Health Board area in 1989, 126 (83%) gave permission to examine their GP10 forms. Annotated lists were returned by 119 (79% of the 151 principals contacted); the remaining seven did not return the lists despite the two written reminders. As a result, 419 asthma patients were identified and sent questionnaires. Sixteen questionnaires were returned marked 'not known' or 'gone away'; replies were received from 349 (87%) of the remaining 403.

The second sample

In 1991, the total number of principals eligible for the study in the Grampian Health Board area was 280, excluding the general practitioners who had not participated in 1989, but including new principals. Of these, 273 (98%) gave permission for their GP10 forms to be examined; all but two returned annotated lists after a

Table 1. Responses from general practitioners and asthmatic patients.

	Grampian		Highland	
	1989	1991	1989	1991
Total no. of GPs in area	304	—	151	—
No. of GPs contacted	295	280	151	133
No. of GPs giving permission to use GP10 forms	268	273	126	131
No. of patients identified initially	1551	1464	656	668
No. of GPs returning annotated lists of patients	265	271	119	127
No. of patients sent questionnaires	940	1045	419	452
No. of questionnaires returned by the Post Office ^a	44	54	16	16
No. of questionnaires returned by patients	769	847	349	362

^a Marked 'gone away' or 'not known.'

single reminder. From the 271 lists, 1045 asthmatic patients were identified, each of whom was sent a questionnaire. Fifty four questionnaires were returned by the Post Office. Of the remaining 991, 847 (85%) were returned.

Of the 133 principals contacted in the Highland Health Board area in 1991, 131 (98%) gave permission to use their GP10 forms. Annotated lists were received from all but four, that is 127 (95% of the 133 principals contacted). Of the questionnaires sent to the 452 patients identified from these lists, 16 were returned by the Post Office. Replies were received from 362 (83%) of the remaining 436 patients.

Thus, the overall response rate by patients to the questionnaires was 86% in 1989 and 85% in 1991. However, the total number of replies received rose from 1118 to 1209, as the interlocking sample design identified more asthmatic patients in 1991 than in 1989.

Discussion

The Nuffield report¹⁷ recommended that the Prescription Pricing Authority should create a research database on prescribing, and the council of the Royal Pharmaceutical Society supported this recommendation.¹⁸ At present the data available from the Pharmacy Practice Division in Scotland are restricted to the drug and preparation, the quantity prescribed, the general practitioner and pharmacist contractor codes, and the prescription code. However, this limited information can be used to identify prescriptions for specific drugs or groups of drugs, and thus to obtain further information from individual prescriptions, such as patient names and addresses. As well as identifying asthmatic patients, this method could be employed to identify other groups of patients, for example patients with angina,¹⁹ diabetes or glaucoma.

The task of working through the prescriptions for the Grampian and Highland Health Board areas was substantial: the total number of prescription items for June 1988 was 420 000, and for June 1990 was 440 000. The method described for 1989 was effective in identifying asthmatic patients in the community, but was time consuming, despite using a form of stratified sampling. The task in 1991 was much simpler, since computerization in 1990 meant that each prescription for an asthma drug could be identified with the cooperation of the Pharmacy Practice Divisions in Aberdeen and Edinburgh.

Prescriptions for asthma medications are recognized as a valid indicator of asthma.^{6,9} However, by also asking the general practitioners in this study to confirm the diagnosis of asthma, the age of the patient, and to exclude those who had attended an outpatient clinic, the specificity of the method was substantially improved: of the patients initially identified from prescriptions, 62% were found to be suitable for inclusion in the study in 1989, and 70% in 1991. The reason for the improvement in specificity in 1991 was that a third of the sample was derived from that used in 1989.

Patients with mild asthma, who may not receive asthma medication regularly, are under-represented using this method, but the same is true of other methods.⁵⁻¹⁰ Patients with severe asthma are also under-represented in this study, as those who had attended an outpatient clinic for asthma during the past year were excluded. The exclusion criteria could be adapted in future studies to include these more severe patients.

The cooperation of general practitioners is crucial to the success of the method. In 1989, 86% of the general practitioners who were eligible to take part contributed to the study. In 1991, the response rate increased to 96% because only those principals who had taken part previously and new principals were contacted.

The response from patients was similar in both surveys: in 1989, 1118 (86%) of those randomly sampled from the lists of the participating general practitioners completed and returned questionnaires; and in 1991, replies were received from 1209 patients (85%).

This method has been successful in identifying comparable samples of eligible patients in two health board areas. It is therefore likely to be appropriate in other parts of the United Kingdom. With the cooperation of general practitioners who confirm the diagnosis, GP10 prescription forms provide a useful resource for the identification of random samples of patients receiving drug treatments in a specific period. This is particularly true following computerization of the prescription pricing service throughout the UK.

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