Developing a district diabetic register

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Abstract

Objectives—To compile a district wide diabetic register of all diabetic patients registered with general practitioners in the catchment area of a single district general hospital and to compare different approaches to identifying patients.

Design—Information for a register was obtained from general practitioners' practice registers, the Prescription Pricing Authority, and hospital diabetic clinic records.

Setting—Catchment area of an inner London district general hospital with a large diabetic clinic.

Subjects—All patients with a diagnosis of diabetes resident in or attending general practitioners or hospital clinics in the district or its catchment area.

Main outcome measures—Prevalence of diabetes, population of patients elicited by different approaches, proportion attending the local district general hospital, cost of using prescription returns for identifying diabetic patients.

Results—4674 patients with diabetes were identified from all sources of information, which corresponds to a mean of 22.4 patients per general practitioner and the prevalence of known diabetes of 1.17%. 39.4% of patients identified had Prescription Pricing Authority returns and 42.8% of patients appeared on practices' diabetic registers. Only 56.5% of patients identified attended the district general hospital. For practices where all sources of information were available, practice registers included 60.4% of all patients, and prescription returns and the clinic register identified 64.9% and 40.6% respectively. The cost of using prescription returns to identify patients not detected in other ways was £6.37 per patient.

Conclusion—The task of developing district diabetic registers may prove, even in one cross sectional attempt, a major task in many inner city health districts.

Introduction

General practitioners are becoming increasingly involved in the management of their diabetic patients,¹ partly because of a concern to provide them with comprehensive care but also because the general practitioner contract has encouraged the development of health promotion clinics in diabetes.² In addition, consultants are reducing the size of their outpatient clinics, where patients sometimes attend inappropriately, to leave more time for those patients who most need it.

Many diabetic patients receive good, structured diabetic care when their general practitioner is involved either in some form of shared care or runs a practice miniclinic.³ In our experience, however, many inner city practices lack the space and staff to provide structured diabetes care. Identification of all diabetic patients registered with a practice is an essential starting point for structured care.⁴ This is equally true

in hospital clinics, where patients who miss appointments can be lost to follow up.⁵ The British Diabetic Association has proposed that health districts should develop a comprehensive district diabetic register to encompass all patients attending hospital clinics as well as those attending their general practitioners for diabetic care.⁶

We attempted to compile a comprehensive district wide diabetic register, to be held on a database, by combining details of diabetic patients ascertained from several different sources. The efficacy of the various approaches is the subject of this report. We aimed at assessing the efficiency and cost effectiveness of collecting data from several different sources: doctors' own practice registers; Prescription Pricing Authority returns; family practitioner committee exemption certificates; and hospital clinic registers.

Methods

PRACTICES PARTICIPATING IN STUDY

A total of 209 general practitioners in 89 practices were either located in the acute services catchment area of the Whittington Hospital or using the hospital's diabetic clinic as their main clinic for referral. A further four general practitioners retired within three months of the start of the project and were thus excluded from further consideration. All doctors were approached by letter and asked for their signature to obtain copies of their prescriptions for diabetic drugs, equipment, and reagents from the Prescription Pricing Authority in Newcastle; and copies of patients' exemption certificates from the family practitioner committee. Because of the geographical location of the Whittington Hospital, and the historical patterns of referrals, these doctors covered patients in six health districts and in four family practitioner committee (family health service authority) areas (fig 1).

Practices that were compiling a diabetic register from scratch used a combination of approaches. Repeat prescriptions were often used to identify all patients taking drugs over a two to three month period. Doctors also kept notes of diabetic patients who attended for other than diabetic consultations. Those patients who were treated by diet alone were more difficult to identify and were often recorded from memory by either the general practitioner or other practice staff. In many cases, practices used the development of a diabetic register as a first step to instigating some system of structured diabetic care. No attempt was made during the study to verify the diagnosis of diabetes in those patients identified in general practice.

ASCERTAINING DIABETIC PATIENTS

Practice diabetic registers—Doctors were contacted by telephone and asked if the practice kept a diabetic register. Those without registers were asked whether they would be prepared to compile one using, for example, repeat prescriptions or patient records and patients recalled from memory. Practices were pro-

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BMJ 1992;305:627-30

FIG 1—Health district, hospitals, and catchment area of participating practices

vided with record sheets (Appendix) to assist with data collection.

Prescription Pricing Authority returns—The Prescription Pricing Authority in Newcastle was approached to obtain copies of the doctors' prescriptions for drugs, reagents, and equipment related to diabetes. It was agreed that this could be done, on receipt of the doctors' signatures, for two periods of three months, April to June 1989 and September to November 1989. These copies were available for practices in Islington, Camden, Haringey, and Enfield districts. Because of the small number of practices involved in City and East London and Barnet the authority was unwilling to provide prescription returns for these districts.

Family practitioner committee exemption certificates—The family practitioner committees concerned were willing to provide exemption certificates, but it is, as yet, a very laborious manual exercise to extract this information from their records. For this reason, and owing to staff shortages, all family practitioner committees were unable to provide the data.

Hospital clinic records—A computerised list of all patients attending diabetes clinics at the Whittington and Royal Northern hospitals was available as another data source.

Other sources of information—The diabetic liaison sister and diabetic specialist nurse identified no additional patients to those traced through an alternative method.

APPROVAL FOR THE STUDY

Approval was sought from Camden and Islington family practitioner committee, local medical committee, and ethical committee as well as from these committees in the adjoining health districts of Enfield and Haringey, Barnet, City and Hackney, Bloomsbury, and Hampstead. Initially Camden and Islington local medical committee gave its approval but later became concerned about confidentiality. After protracted discussions the committee decided that general practitioners may wish to obtain their patients' consent before releasing data and that the Prescription Pricing Authority returns should be sent directly to the general

practitioners concerned rather than to the research unit. City and East London local medical committee and Barnet ethical committee both imposed the same restrictions.

Results

PARTICIPATION IN DATA COLLECTION

Two hundred and nine general practitioners in 89 practices were approached at the start of the study; of these, 20 already had a diabetic register. Seventy five per cent of general practitioners (in 73% of the practices) agreed to supply diabetic registers to the project (table I) and 89% of general practitioners gave signed consent for their Prescription Pricing Authority returns to be made available. By March 1991 diabetic registers had been received from 126 general practitioners in 47 practices, 72% of practices that had agreed to participate. Table II shows the number of principals in the practices approached. Eight out of nine practices (89%) with six or more partners provided registers, but only 39 of 80 practices (49%) with five or fewer partners did so (Fisher's exact two tailed test, $p=0.03$).

TABLE I—Participation in data collection by general practitioners

	No (%) of general practitioners	No (%) of practices
Approached to take part in project (March 1989)	209	89
Approval for PPA returns	189 (89)	80 (90)*
Agreed to supply practice registers	156 (75)	65 (73)
Registers received from those participating up to March 1991	126 (81)	47 (72)
PPA returns received†	90 (43)	34 (38)
Registers and PPA returns received	73 (35)	25 (28)

PPA=Prescription Pricing Authority.

*Practices where one or more doctors gave signed consent.

†Returns were not sent directly to the research unit for practices in all districts; this figure represents the proportion supplying information from the returns.

TABLE II—Practice profile (mean list size 1929 patients per general practitioner)

	Single handed	2 Partners	3-5 Partners	≥6 Partners
No of practices	37	20	23	9
No (%) of practices who supplied diabetic register	17 (46%)	11 (55%)	11 (48%)	8 (89%)

IDENTIFICATION OF DIABETIC PATIENTS

In total, 4674 patients with diabetes were identified on the lists of the 209 general practitioners in all 89 practices by combining all sources of information (fig 2), a mean of 22.4 patients per general practitioner.

FIG 2—Numbers of patients with diabetes identified by different methods in 89 practices ($n=4674$)

The average list size of the general practitioners approached was 1929, which gives a prevalence of known diabetes of 1.17%. Figure 2 also shows the number of patients identified using one or more of the three major approaches. Of all patients identified, less than half (42.8%) were included on general practitioners' diabetic registers, while Prescription Pricing Authority returns identified 39.4% of the total. A total of 2642 (56.5%) of the patients identified attended clinics at the Whittington or Royal Northern Hospital; 2211 (83.6%) were current attenders and 431 (16.3%) had not attended the clinic for two or more years. Around a third of all patients were picked up only from the hospital clinic register. The study did not attempt to identify patients attending diabetes clinics in other hospitals.

The numbers and proportions of patients in the different categories were influenced by the fact that not all practices provided a register and that full details on the patients identified both by general practitioners' diabetic registers and by Prescription Pricing Authority returns were available for only 73 general practitioners (35%) in 25 practices (28%). In these 25 practices where all sources of information were available (fig 3) 25.3 patients per general practitioner were identified.

FIG 3—Numbers of patients with diabetes identified by different methods in 25 practices for which all data was available. Total before adjustment was 1847; total after adjustment was 1723

These doctors had a mean list size of 1822; the prevalence of diabetes was calculated to be 1.39%. The general practitioners' diabetic registers included 60.4% (range 31.0%-95.6%) of identified patients and the Prescription Pricing Authority returns 64.9% (51.2%-83.3%) (table III). In these practices, of the 749 patients (40.6%) who appeared on the hospital clinic registers, 481 (64.2%) were also identified through another source.

Because of the high population mobility and the fact that the practice registers were often compiled outside the periods of Prescription Pricing Authority returns (April-November 1989) we compared the 13 practices in which the registers were compiled within the period of prescription returns with the 12 practices in which the period did not coincide (December 1989-June 1990). The percentage of patients "missed" by practice registers increased from 18.3% when the registers and prescription returns were compiled concurrently to 40.7% when they were compiled in separate time periods ($p<0.001$). Paradoxically, fewer patients were "missed" by prescription returns when the data collection period did not coincide (17.1% v 30.9%, $p<0.001$), suggesting that population mobility alone can not explain the major part of the discrepancies.

In eight of these 25 practices, staff recorded the possible causes for discrepancies between patients identified in different ways. These practices included 97 patients (18% of the total) identified by Prescription

TABLE III—Elucidation of patients by 73 general practitioners in 25 practices for which all sources of information were available

		No (%) of practice registers		
		Yes	No	Total
No (%) of prescription returns	Yes	735 (39.8)	463 (25.1)	1198 (64.9)
	No	381 (20.6)	268 (14.5)*	649 (35.1)
Total		1116 (60.4)	731 (39.6)	1847

*Clinic register only.

TABLE IV—Characteristics of methods of ascertaining diabetic patients in 25 practices for which all data was analysed

	Sensitivity (%) (95% confidence interval)	Positive predictive value (%) (95% confidence interval)
Practice register	61.7 (59.4 to 64.0)	95.3 (94.1 to 96.6)
Prescription Pricing Authority	68.4 (66.2 to 70.6)	98.3 (97.6 to 99.0)
Hospital records	40.4 (38.1 to 41.6)	93.0 (91.2 to 94.8)

Pricing Authority returns but who were not identified on the practice diabetic registers. All but six of these were genuine diabetic patients currently registered with the practice. Of the remainder, two were not diabetic (syringes had been prescribed for other reasons) and four were temporary residents. Of 131 patients (24% of the total) on the practice registers for whom no prescription return was received, 26 (20%) were discovered to be no longer registered with the practice, having moved away or died. Another 43 (33%) were diabetic but treated by diet alone. The remaining 62 (47%) did not receive prescriptions during the six months of prescription monitoring. Finally, of 43 patients (8% of the total) identified only by the hospital clinic register, 22 (51%), all but one not current attenders, had either died or moved away or had never been registered with the practice. A further 21 (49%), all current clinic attenders, were registered with the practice.

If it is assumed that similar proportions of patients in all of these categories existed for the study population as a whole (fig 2), a total of 3577 patients would be identified. However, as pointed out above, information on many of these practices was incomplete. The same scaling for the 25 practices for which complete information was available reduces the number of diabetic patients by 6.7% (23.6 diabetic patients per general practitioner); the prevalence of known diabetes then becomes 1.29%. The proportion of patients detected by clinic registers at the Whittington and Royal Northern hospitals in this scaled population would be only 40.4%. Some sort of transient "gold standard" against which the different approaches can be compared can be derived from these scaled figures (table IV).

COST EFFECTIVENESS OF PRESCRIPTION RETURNS

The Prescription Pricing Authority provided copies of diabetic prescriptions at a cost of £30 per 100. There were 1840 patients so identified at a cost of £4066.87, corresponding to a unit cost of £2.21. This unit cost, when calculated on a month by month basis, rose from £0.32 in month 1 to £2.49 in month 6. For patients identified only through prescription returns the unit cost was £6.37. No attempt was made to calculate the clerical, administrative, and research costs for the study.

Discussion

A total of 209 doctors in 89 local practices were invited to join the project; 156 doctors in 65 practices (73%) agreed to participate. Diabetic registers were received from 72% of those who agreed to take part, making a total participation of 60% of general prac-

tioners and 53% of practices. The practices involved varied considerably in terms of number of principals, practice premises, and the number of ancillary staff employed. Doctors' readiness to participate was influenced by several factors, such as their interest in diabetes, whether or not they already had a diabetic register (ledger, Kardex, or computer), and the amount of work that would be involved if they were to compile a diabetic register in their practice. Practice resources were stretched by the introduction of the general practitioners' contract in April 1990. The issue of confidentiality also affected the completeness of the district register. There were doctors who felt unable to participate for this reason, and some wished to obtain their patients' consent. The practical problem of obtaining patients' consent meant that some registers were inevitably incomplete.

The different ways in which Prescription Pricing Authority returns were available to the research team severely restricted both the completeness of data collection and the ability to compare the efficacy and cost effectiveness of the three main data sources. Nevertheless, on the basis of the practices for which each data source was available, the prescription returns provided the most sensitive approach and the smallest false positive rate and is the method least susceptible to variation between practices. The usefulness of the returns as a method of identifying diabetic patients, however, varied greatly between practices. Where a diabetic register already existed but had not been regularly updated there was a greater pick up rate by prescription returns and a substantial mismatch between the returns and the register. The reverse was true where a practice diabetic register was regularly maintained and updated, and these practice registers provided the most accurate data. Prescription returns also "missed" 19.3% of diabetic patients receiving drug treatment in the eight practices in which all information was available. In this study, using scaled figures, it was possible to identify less than three quarters of all patients, even with six months of prescription returns, and the marginal costs of further periods of prescription monitoring would be likely to mount considerably. The patients who are most difficult to identify are those who are not taking insulin or oral hypoglycaemics and who are not testing their urine, but these patients are, clearly, not immune to diabetic complications.

These scaled figures showed that an estimated 40.4%

of patients from participating practices attended clinics at the Whittington and Royal Northern hospitals. This figure does not reflect the total number of diabetic patients receiving hospital care, however, as the catchment area overlaps those of other London hospitals. Several studies have shown that somewhat less than half of all diabetic patients identified in a district attend a hospital clinic.^{7,8}

In conclusion, this project has highlighted the many problems inherent in providing a comprehensive diabetic register in an inner city district. We did not assess the feasibility of a system whereby the data received from practices could be continually updated, which might be particularly difficult because of the high turnover of patients registered with participating practices. Despite all these problems, a district diabetic register has been set up and valuable links established with local practices which can be sustained. This has led to a heightened awareness of the need to identify all diabetic patients as a first step to good structured diabetic care.

We are grateful to the King's Fund, the Greater London Enterprise Board, and the London New Technology Network for their financial support. We thank all the general practitioners and their staff who participated in this project. Thanks also to June Wakefield and Jennifer Blake at the Prescription Pricing Authority for their help and to Maria Varnavas and Sara Stanner in the Academic Unit of Diabetes, who assisted with data analysis and in the production of this report.

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(Accepted 8 July 1992)

ANY QUESTIONS

What is a suitable treatment for threadworms in a middle aged woman who has suffered since early childhood?

Threadworm (*Enterobius vermicularis*) infection occurs worldwide. It is one of the commonest parasitic infections, and children are affected more commonly than adults. It is especially common in family groups, institutions, asylums, schools, and camps, particularly when overcrowding is present. It can occur where standards of hygiene, nutritional states, etc, are excellent, and the stigma sometimes associated with infection is unjustified. Eggs are ingested from contaminated hands (especially fingernails) or in food and occasionally water; autoinfection is common. The classic symptom is pruritus ani, which is often most troublesome at night, but many infections are asymptomatic.

It is important to establish that the infection is in fact still present; parasitophobia is not uncommon in middle aged women, especially if they have experienced past infection(s). Therefore a parasitological diagnosis is essential; haemorrhoids and erythrasma (both of which can also produce pruritus ani) must be positively excluded.

About 90% of infections can be detected from three anal swabs; six negative results on separate days virtually exclude infection. A transparent adhesive strip may be placed across the anus to collect the eggs or adults. A faecal sample rarely yields a positive result.

In addition to rigorous application of the usual hygienic measures all members of the family (whether symptomatic or not) should be treated simultaneously. The benzimidazoles form the bedrock of chemotherapy; mebendazole (100 mg) repeated after one to two weeks is usually effective; albendazole (400 mg), which is available in the United Kingdom on a named patient basis only, is probably marginally superior. Most persisting infections, however, probably result from reinfection.—G C COOK, consultant physician, London

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