Diabetes registers: a grassroots approach

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Abstract

Objectives—To compile a register of diabetic patients within the catchment area of a district general hospital and evaluate the characteristics of the population using aggregated data from a general practice audit.

Design—Cross sectional study. Practices identified all known diabetics and completed a questionnaire from information in each patient's medical record.

Setting—Practices affiliated to a district audit group in south east England.

Main outcome measures—Number of participating practices; prevalence of diabetes and its complications; and sex distribution of patients, age at diagnosis and review, treatment, and metabolic control. Comparisons with similar data from other studies.

Results—41 out of 43 practices participated, and 2574 diabetic patients were identified (prevalence 1.18%). 52.4% of patients were male. The mean age was 61.6 years. 32% of patients were treated with insulin, 51.5% with oral hypoglycaemic agents, 16.5% with diet alone. The mean random blood glucose concentration was 10.4 mmol/l and glycosylated haemoglobin 10.1%. 8% had proteinuria, 7% a history of myocardial infarction, 5% a history of stroke, and 2% a diabetes related amputation. These proportions were not significantly different from those found in studies performed by different methods in Poole, Islington, Powys, Trowbridge, and Southall.

Conclusion—It is feasible to compile a register of diabetic patients in a district and evaluate their characteristics by using only general practice sources.

Introduction

Diabetes registers are central to running an organised district diabetes service¹ though they may be difficult to compile.² Hospital departments have traditionally compiled these registers, deriving the information from a variety of sources.^{2,3} The registers have never been comprehensive enough to provide information about the characteristics of diabetic populations: such data have come mainly from epidemiological surveys.⁴⁻⁶

General practitioners are becoming increasingly concerned in the care of their diabetic patients.⁷ Amendments in 1993 to the regulations for disease management clinics in general practice require practices to report annually the number of diabetic patients on their lists, how many are dependent on insulin, and how many have had an annual review.⁸ This will require individual practices to maintain their own registers, though in the past such registers have been criticised as being limited.^{9,10} This raises the possibility of establishing a comprehensive diabetic register by aggregating individual practices' records.

As part of a questionnaire study by the Tunbridge Wells audit group to audit the care given to diabetic patients we also tested the feasibility of compiling such a register.

Methods

Tunbridge Wells Health District has a population of about 230 000, almost entirely of European origin. The age distribution is similar to that of the rest of the United Kingdom. Within the district there are 125 general practitioners in 44 practices, nine of them singlehanded and 10 of them training practices. One hundred and eighteen general practitioners in 41 practices are affiliated to the audit group. Three outlying practices who use the hospital of a neighbouring district liaise with that district's medical audit advisory group. Similarly, two practices within an adjacent family health services authority area participated in our study. The principal hospital diabetic clinic is in Tunbridge Wells, with a smaller clinic in Sevenoaks to the north. No formal scheme exists in the district for sharing diabetic care between hospital and general practice.

After discussion with general practitioners and practice nurses in the district a standardised questionnaire was devised to identify all the diabetic patients in each affiliated practice and to measure processes of care and their outcome against accepted standards.

Practices were responsible for identifying patients known to be diabetic. For each patient a member of the practice team completed a questionnaire based on information present in the patient's records. An item was recorded as being present or performed, irrespective of who had initially recorded it—that is, whether it was done in the practice, in hospital, or by some other agency.

For each practice we recorded total list size, number of partners, and number of diabetic patients identified. For each diabetic patient we asked the practice to record: date of birth, sex, year of diagnosis, method of treatment (insulin, oral therapy, or diet alone), and attendance at a hospital outpatient clinic for diabetes. Information was also recorded on the presence in the past 12 months and last recorded value of random blood glucose concentration, glycosylated haemoglobin, serum creatinine concentration, and urine analysis for proteinuria. Complications recorded since the time of diagnosis included diabetes related amputation, myocardial infarction, stroke, retinopathy requiring referral, retinopathy requiring registration for blindness or partial sight, and renal disease needing replacement treatment.

The questionnaires were returned to us for processing. The data were entered into EpiInfo, a public domain computer program originally devised for epidemiologists.¹¹ Patient names (which were included by the practices so that they had a record on which to base the following year's record) were replaced by code numbers, which were marked on the questionnaires

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before they were returned to general practitioners. Similarly, doctors' names were entered on the computer program as code numbers only. A standardised report was produced for each general practitioner or practice.

Having a uniform questionnaire for all practices enabled us to aggregate practice data to produce data for the whole district. The aggregated data were then compared with previously published data to assess their validity. Comparisons were made using χ^2 analysis and standard error of the difference of means (for analysis of patient ages).

Results

Of 43 affiliated practices, 41 participated, representing 120 out of 125 general practitioners. After a pilot study in two practices the data were collected over six months.

A total of 2574 patients with diabetes were identified, with a mean prevalence per practice of 1.18% (range 0.5-2.0%, with 33 practices having a prevalence of $\geq 1.0\%$). Table I shows prevalence in comparison with other recently published studies. The prevalence reported in Tunbridge Wells was significantly higher than in Poole ($p < 0.05$) but no different from that in Islington. Men accounted for 52.4% (1350) of the patients, a proportion not significantly different from that in Poole (52.2%)³ and Trowbridge (47%).⁶

Details of patients' ages and duration of diabetes are shown in table II. There was no significant difference in the age at review or duration of diabetes between Poole and Tunbridge Wells. In Tunbridge Wells 1605 patients (62%) were aged 60 or more, a similar proportion to Powys; 1317 (51%) were aged 65 or more, again not significantly different from Poole and Trowbridge.

Fewer patients in Tunbridge Wells were treated with insulin than in Poole ($p < 0.05$) but there was no significant difference from the proportions treated in Southall, Powys, or Trowbridge (table III). Nine hundred and twenty three (36%) of the Tunbridge Wells patients were attending a hospital clinic.

Assessment of risk factors and metabolic control—Within the previous 12 months random blood glucose concentration had been estimated in 2209 patients (86%), glycosylated haemoglobin in 1629 (63%), serum creatinine in 1037 (40%), and proteinuria in 1550 (60%) patients. Table IV shows levels of metabolic control as defined by means of random blood glucose and glycosylated haemoglobin.

TABLE I—Prevalence diabetes

Location	Year	No of patients	Prevalence (%)	Methods used to identify patients
Tunbridge Wells	1993	2574	1.18	General practice registers
Islington ²	1992	4674	1.17	General practice and hospital registers and PPA returns
Trowbridge ⁶	1992	405	1.31	General practice and hospital registers
Powys ^{1,2}	1989	469	1.01	General practice registers
Poole ³	1988	917	1.01	General practice and hospital registers
Oxford ¹³	1987	431	1.08	Hospital registers and postal questionnaires
Southall (Europeans) ⁵	1985	324	1.20	House to house inquiry

PPA = Prescription Pricing Authority.

TABLE II—Mean (SD) ages of patients at time of review and duration of diabetes

	No of patients	All patients	Treatment		
			Insulin	Oral hypoglycaemic drugs	Diet alone
Age at review (years):					
Tunbridge Wells	2574	61.6 (18.1)	48.1 (20.5)	67.7 (12.7)	69.0 (12.1)
Poole ⁴	842	61.0 (18.6)			
Trowbridge ⁶	358	59.8			
Duration of diabetes (years):					
Tunbridge Wells	2574	9.6 (9.3)	15.9 (11.0)	7.3 (6.7)	4.5 (5.3)
Poole ⁴	842	10.1 (8.9)			
Southall (Europeans) ⁵	324	9			
Trowbridge ⁶	358	11			

TABLE III—Treatment of diabetes. Results are percentages of patients

	No of patients	Treatment		
		Insulin	Oral hypoglycaemic drugs	Diet alone
Tunbridge Wells	2574	32.0	51.5	16.5
Poole ³	901	39.5	40.4	20.1
Powys ¹²	469	30	54	16
Southall (Europeans) ⁵	320	30	46	24
Trowbridge ⁶	336	30	51	19

TABLE IV—Mean (SD) random blood glucose and glycosylated haemoglobin concentrations

	No of patients	All patients	Treatment	
			Insulin	Non-insulin
Random blood glucose (mmol/l):				
Tunbridge Wells	2209	10.4 (4.7)	11.2 (5.5)	10.1 (4.2)
Poole ⁴	842	9.0	9.7	8.7
Glycosylated haemoglobin (mmol/l):				
Tunbridge Wells*	1629	10.1 (2.3)	10.6 (2.3)	9.8 (2.3)
Poole ⁴ †	842	8.7	9.5	8.7
Trowbridge*‡	358	12.1		

*Agar gel electrophoresis; non-diabetic range 5.6-8.9%.

†Colorimetric method; non-diabetic range 5-9%.

‡Agar gel electrophoresis; non-diabetic range 6.0-8.9%.

Complications—Of 1011 patients who had had a creatinine estimation in the past year, 149 (15%) had a value equal to or greater than 120 mmol/l. Of 1537 patients who had had urine analysis performed, 126 (8%) had proteinuria, compared with 6.8% in Poole (no significant difference) and 5% in Trowbridge ($p = 0.04$). One hundred and eighty five (7%) had sustained a myocardial infarction, 116 (5%) a stroke, 57 (2%) a diabetes related amputation (compared with 2.9% in Poole who had had an ulcerated or amputated lower leg). Eight patients (<1%) were receiving renal replacement treatment, and 277 (11%) had retinopathy requiring referral. Ninety (4%) patients were registered blind or partially sighted.

Discussion

One concern about data collected in this way is their validity because general practice registers have previously been thought to be inaccurate. That two well conducted largescale surveys (in Islington and Poole) produced prevalence rates similar to² and less than³ that reported here suggests that our method is at least as effective as other methods. A second concern about the validity of the data is their comprehensiveness. However, in comparing our data, produced independently by 41 practices, with those from a large epidemiological survey in Poole, in which all patients were examined by a single doctor,^{3,4} we found no significant differences in age at review, duration of diabetes, sex ratios, proportion of patients aged over 65, or prevalence of proteinuria. Absolute differences in mean blood glucose and glycosylated haemoglobin concentrations between insulin and non-insulin treated patients were similar in the two surveys. Fewer patients were treated with insulin in Tunbridge Wells. This fact, combined with the better levels of metabolic control in Poole, may indicate the success of the Poole shared care scheme, as the proportion of patients treated with insulin in Tunbridge Wells was not significantly different from that in areas where no such shared care scheme exists.^{5,6,12} If we assume that the populations are comparable there is no evidence that the information we collected is significantly different from that produced in a more rigorously controlled fashion from other sources.

The main role of the audit group was to facilitate the production of an audit template and act as a centre for

data processing and report generation. Practices were told that the data would be aggregated. They were supplied with an audit report for their own patients and, once all practices had submitted their information, a similar report covering all patients to enable them to compare their performance with others. Because the audit group guaranteed that confidentiality would be respected no assessment of interpractice variation was made beyond prevalence rates.

Previous attempts to involve general practitioners in compiling diabetic registers have not always been successful.² Factors influencing the favourable response to this initiative may have been that it was based on general practice, that the data were fed back to the practices in a way which was beneficial to them, and that confidentiality was maintained.

IDENTIFYING PATIENTS

Most of the effort of identifying patients was borne by the practices themselves and the cost of entering the data on to computer was funded by the audit group, so the additional cost of producing a register from the aggregated data was small. Additional costs would probably be incurred in maintaining such a register but with the support of local general practitioners these costs need not be large.

As the data were primarily collected for audit we did not enter patients' names into the computer. But these could be included, possibly on a parallel program, if a scheme for shared¹⁴ or prompted care¹⁵ existed in a district, or if there was a screening service for microvascular complications.⁶ Without names the value of such district diabetes registers to purchasers is limited to assessing quality and volume, particularly of support services for patients not attending an outpatient clinic.

The population identified in this study was patients registered with general practitioners in a health district. Although most patients live in the towns in the centre of the district, some patients may live in adjacent districts, and, similarly, patients living in this district may be registered with a general practitioner outside it. If it was important to identify all patients living within a district the inclusion of postcodes could identify those living outside. Residents registered with a general practitioner in an adjacent district could be identified if a similar scheme was operating there and a common dataset was used.¹⁶

There is now evidence to suggest that general practice can offer the vast majority of diabetic patients a standard of care whose processes¹⁷ and levels of metabolic control^{17,18} are at least equal to those obtained in hospitals. We suggest that the responsibility for identifying all diabetic patients is also within the competence of general practitioners and that medical audit advisory groups may have a role in coordinating the annual identification of patients and evaluating the care they receive within districts.

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- 1 Ward JD, MacKinnon M. Purchasing for quality: the provider's view. *Diabetes care. Quality in Health Care* 1992;1:260-5.
- 2 Burnett SD, Woolf CM, Yudkin JS. Developing a district diabetic register. *BMJ* 1992;305:627-30.
- 3 Gatling W, Houston AC, Hill RD. The prevalence of diabetes mellitus in a typical English community. *J R Coll Physicians Lond* 1985;19:248-50.
- 4 Gatling W, Hill RD. General characteristics of a community-based diabetic population. *Practical Diabetes* 1988;5:104-7.
- 5 Mather HM, Keen H. The Southall diabetes survey: prevalence of known diabetes in Asians and Europeans. *BMJ* 1985;291:1081-4.
- 6 Higgs ER, Kellener A, Simpson HCR, Reckless JPD. Screening programme for microvascular complications and hypertension in a community diabetic population. *Diabetic Medicine* 1992;9:550-6.
- 7 Jones JN, Marsden P. Improved diabetes care in a UK health district. *Diabetic Medicine* 1992;9:176-80.
- 8 General Medical Services Committee. *The new health promotion package*. London: British Medical Association, 1993.
- 9 Mant D, Tulloch A. Completeness of chronic disease registration in general practice. *BMJ* 1987;294:223-4.
- 10 Donaldson L. Registering a need. *BMJ* 1992;305:597-8.
- 11 *Epi Info version 5.01* [computer program—word processing, database and statistics for epidemiology]. Stone Mountain, Georgia: USD Inc, 1990.
- 12 Gibbins RL, Saunders J. Characteristics and pattern of care of a diabetic population in mid-Wales. *J Roy Coll General Pract* 1989;39:206-8.
- 13 Neil HAW, Gatling W, Mather HM, Thompson AV, Thorogood M, Fowler GH, et al. The Oxford community diabetes study: evidence for an increase in the prevalence of known diabetes in Great Britain. *Diabetic Medicine* 1987;4:539-43.
- 14 Hill RD. Community care services for diabetics in the Poole area. *BMJ* 1976;ii:1137-9.
- 15 Hurwitz B, Goodman C, Yudkin J. Prompting the clinical care of non-insulin dependent (type II) diabetic patients in an inner-city area: one model of community care. *BMJ* 1993;306:624-30.
- 16 Wilson AE, Home PD for the Diabetes Audit Working Group of the Research Unit of the Royal College of Physicians and the British Diabetic Association. A dataset to allow exchange of information for monitoring continuing diabetes care. *Diabetic Medicine* 1993;10:378-90.
- 17 Parnell SJ, Zalin AM, Clarke CWF. Care of diabetics in hospital clinics and general practice clinics: a study in Dudley. *Br J Gen Pract* 1993;43:65-9.
- 18 Pringle P, Stewart-Evans C, Coupland C, Williams I, Allison S, Sterland J. Influences on control in diabetes mellitus: patient, doctor, practice or delivery of care? *BMJ* 1993;306:630-4.

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A PATIENT WHO CHANGED MY PRACTICE

Advise yes, dictate no

I first met George when he was 55 and he consulted me about his varicose veins. He was surprised by my enthusiasm to widen the consultation with inquiries about his lifestyle. He smoked 20 cigarettes a day and consumed 40 units of alcohol a week. He clearly did not see it as a problem. I lectured him on the dangers of smoking and the most effective way to stop. He listened with a gentle smile and said:

"Doctor, I'm very happy with my lifestyle as it is. I reckon the life expectancy of men of my age in our factory is about 63. I'll be happy to match that. I don't want to change the enjoyable habits of a lifetime so that I can have 20 boring years of retirement. What is more important to me is the quality of my life now, not the quantity then."

His thoughtful and reasoned reply was a Damascus road experience for me. I decided to think afresh about lifestyle counselling. I heard about the doctor who proudly declared that, as a result of his lifestyle counselling, none of his patients were smokers. His partners knew, however, that the smokers either lied to him or avoided him. They were too kind and thoughtful to upset him.

Being George's family doctor has not been easy. He has

had peripheral vascular disease, a myocardial infarction, and two transient ischaemic attacks. He remains happy with his informed choice eight years ago and accepts that he took the risks of continuing to smoke knowingly. He has given up smoking now because he does not want another heart attack.

I continue to wonder what might not have been had I resisted George's charm and found a way to convince him to stop smoking eight years ago. Colleagues tell me that I do not have the right attitude to health promotion and that my patients are suffering.

"Advise yes, dictate no" has become my motto.¹ George has taught me to pay careful attention to my patients' reasons, expectations, and feelings and always allow them the right to say "no, thank you" to my advice.—JONATHAN RICHARDS is a general practitioner in Merthyr Tydfil

- 1 Stott NCH, Pill R. "Advise yes, dictate no." Patients' views on health promotion in the consultation. *Fam Pract* 1990;7:125-31.

We are delighted to receive submissions of up to 600 words on *A paper (or patient or book) that changed my practice, A memorable patient, The one message I would like to leave behind, or related topics.*