

# Who cares for the patient with diabetes? Presentation and follow-up in seven Southampton practices

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**SUMMARY.** A notes survey was undertaken by a group of eight general practitioners in seven Southampton practices to study the mode of presentation and follow-up of the diabetic patients on the lists of 24 doctors. The 431 known diabetic patients were classified as non-insulin-dependent (67%), insulin-dependent (20%), or, if they had commenced their insulin more than a month after the diagnosis had been made, 'insulin-treated' (13%). This classification allowed characterization of the truly insulin-dependent and non-insulin-dependent patients.

Non-insulin-dependent diabetics were older than insulin-dependent diabetics and had first presented at a greater age. Most patients in each treatment group presented with classical diabetic symptoms, diabetes-related infections, or recognized complications. The majority of these were diagnosed in general practice. However, over half of the asymptomatic non-insulin-dependent diabetic patients had been diagnosed by routine blood or urine testing in hospital. After 1979 fewer non-insulin-dependent diabetic patients were referred to hospital for follow-up at diagnosis than before 1975.

Most non-insulin-treated diabetics were followed up in general practice whereas most patients treated with or dependent on insulin were followed up in hospital clinics. Twenty-two per cent of all patients received diabetic care from both their general practitioner and hospital outpatient departments but 20% received no regular diabetic follow-up at all. One year after the initial study, 4% of patients were still without regular review, and 27 more patients had been identified who would have qualified for the original audit.

## Introduction

**D**IABETES mellitus is an increasingly common syndrome with a prevalence of 1–2%.<sup>1</sup> It makes a significant contribution to disability through its long-term side-effects of car-

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diovascular disease, visual loss and renal failure.<sup>2</sup> There is now good evidence that early recognition and treatment of retinopathy and foot problems in diabetic patients can reduce disability and may prolong life.<sup>3–5</sup> The weight of evidence also suggests that lowering high blood glucose levels reduces the risk of long-term complications.<sup>6</sup> Management thus depends on early diagnosis, education in self-care, and regular clinical surveillance of the diabetic population to detect early tissue damage.<sup>7</sup> Patients who remain in contact with a structured system of surveillance seem to fare better than those who do not.<sup>8</sup> Offering such surveillance may be impossible for hospital clinics, which also have to provide a consultant service for the more difficult diabetic problems.<sup>9,10</sup> Any solution must involve general practice, although the details are likely to vary in different areas.

As a step towards improving care of diabetic patients in one area, a group of general practitioners set out to discover in selected practices how the current generation of diabetic patients presented and where they now go for care.

## Method

### Doctors

During 1984, eight general practitioners from seven Southampton practices began meeting each month to carry out comparative clinical audits. One (A-L.K.) is involved in planning an integrated system of diabetic care in Southampton with the diabetic consultant. The group agreed to help with this planning. Two of the doctors had had experience in hospital diabetic units but none held special diabetic 'mini-clinics' in their practices.

### Patients

The records were studied of known diabetic patients in the population of 50 500 people comprising the eight lists and those of 16 of the doctors' partners in Southampton and South-West Hampshire Health District. Fourteen lists are in Southampton or its suburbs and 10 are in neighbouring small towns. The distance of patients from the hospital diabetic clinic varies from two to 10 miles. There is a peripheral hospital diabetic clinic held in one of the country towns. The mean proportion of patients aged over 75 years at the time of the survey was 7.8% with a range of 6–10%.

### Data collection and analysis

Potential diabetic patients were identified between April and July 1984, from practice morbidity registers (eight lists), repeat prescriptions, consultations, the memories of medical, nursing and reception staff, and hospital reports. Each doctor personally reviewed the notes of his or her diabetic patients and those of the partners. Information was collected about the age, sex, presentation, treatment and follow-up of each patient recorded as being diabetic in the notes. Regular follow-up was defined as face-to-face consultation with a doctor to discuss diabetic care at least once a year. The data were analysed on a Sinclair Spectrum 48K microcomputer using a programme written for this purpose.

## Results

### Prevalence

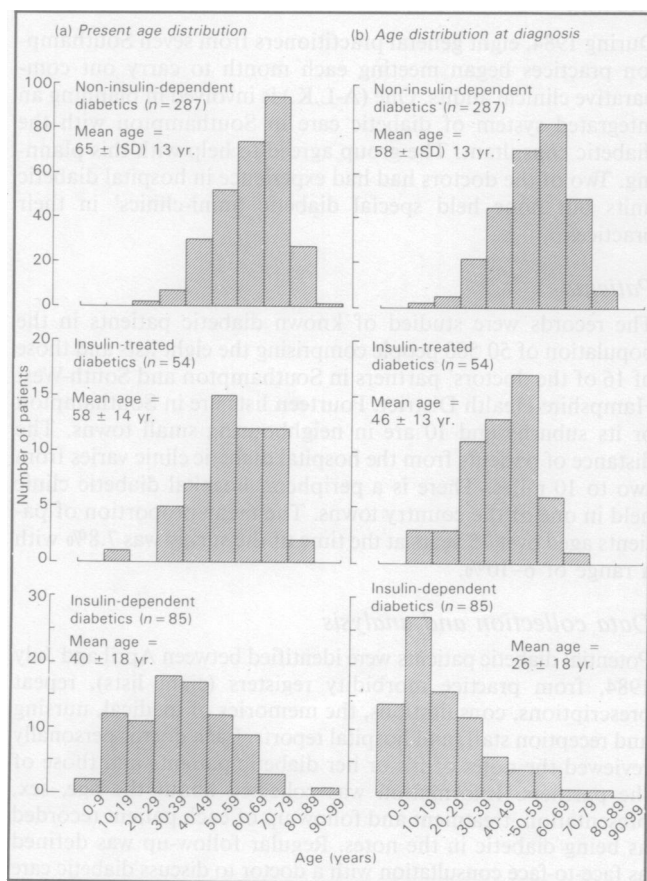
A total of 431 diabetic patients were identified, giving a prevalence of 0.85%. Among individual practices, the prevalence of diabetes varied from 0.6% to 1.2%, being greatest in those practices with the greatest proportion of patients over 75 years of age. There was a slight excess of male patients (233:198).

### Treatment groups

The patients were classified into three treatment groups: 287 (67%) patients had been treated without insulin since diagnosis (non-insulin-dependent diabetics). Of these, 83 were on diet alone and 204 were on oral hypoglycaemic drugs. Eighty five (20%) patients had been on insulin from the time of diagnosis (insulin-dependent diabetics). A group of 54 patients (13%) who had been started on insulin at least a month after diagnosis were classified separately as 'insulin-treated diabetics'. Initial treatment was not clear from the records of the remaining five patients taking insulin, who were excluded from further analysis by the above treatment groups.

### Age

The age distribution of all patients in July 1984 divided by treatment group is shown in Figure 1(a). Eighty-six per cent of non-insulin-dependent diabetics were more than 50 years old, compared with 30% of insulin-dependent diabetics. The insulin-treated group closely resembled the non-insulin-dependent diabetic group with 76% over 50 years old.



**Figure 1.** Age distribution of all diabetic patients by treatment group showing (a) present age distribution and (b) age distribution at diagnosis.

The age distribution at diagnosis of patients in each treatment group is shown in Figure 1(b). Although non-insulin-dependent diabetes was usually diagnosed in late middle age and insulin-dependent diabetes in the young, 11% of non-insulin-dependent diabetics presented under the age of 40 years and 10% of insulin-dependent diabetics presented over the age of 50 years.

### Pre-treatment blood glucose

A pre-treatment blood glucose level was found in the notes of 266 (62%) patients. The mean blood glucose levels ( $\pm$  standard deviations) were:

Non-insulin-dependent diabetics	16.2 $\pm$ 6.1 mM (n = 197);
Insulin-treated diabetics	16.8 $\pm$ 4.5 mM (n = 27);
Insulin-dependent diabetics	25.9 $\pm$ 9.3 mM (n = 42).

Three non-insulin-dependent diabetic patients were identified in whom the diagnosis of diabetes had apparently been made on the basis of random blood glucose concentrations lower than 11 mM.

### Presentation

The method of presentation, where known, in the three treatment groups is shown in Table 1. In each of the three groups, most patients presented with primary symptoms of diabetes (polyuria, polydipsia, with or without weight loss), ketoacidosis, associated infections (candidiasis, recurrent skin sepsis, balanitis/vaginitis) or complications (including retinopathy, cataract, neuropathy). Twenty (24%) of the insulin-dependent diabetic patients presented with clinical ketoacidosis. Of the non-insulin-dependent diabetic patients 42% presented without specific symptoms, and in this group the diagnosis was made mainly during routine tests (for instance at insurance examinations) or while under investigation for other conditions.

Of the 384 patients where the place of diagnosis was known, 73% were diagnosed in general practice. However, a larger proportion of insulin-dependent diabetics (86%) than of non-insulin-dependent diabetics (70%) or insulin-treated diabetics

**Table 1.** Mode of presentation (where known) in the three treatment groups of diabetic patients.

Presentation	Number (%) of diabetics		
	Non-insulin-dependent	Insulin-treated	Insulin-dependent
<b>Symptomatic</b>			
Primary symptoms/ ketoacidosis	71	30	60
Associated infections	61	4	5
Chronic complications	18	2	0
<b>Total</b>	<b>150 (58)</b>	<b>36 (77)</b>	<b>65 (94)</b>
<b>Asymptomatic</b>			
Risk factors present	29	2	1
Unrelated conditions	58	1	1
Routine examinations	21	8	2
<b>Total</b>	<b>108 (42)</b>	<b>11 (23)</b>	<b>4 (6)</b>
<b>Total (n = 374)</b>	<b>258 (100)</b>	<b>47 (100)</b>	<b>69 (100)</b>
Presentation unknown (n = 52)	29	7	16

(69%) was diagnosed in general practice. Table 2 shows how the place of diagnosis relates to the presence of symptoms among the non-insulin-dependent diabetic patients. Over half of the patients without symptoms of diabetes were diagnosed in hospital.

**Referral**

All insulin-dependent diabetic patients had been referred to hospital at the time of diagnosis for initiation of insulin therapy. Data were available on referral patterns of 176 of the 183 non-insulin-dependent diabetic patients diagnosed by general practitioners and not admitted to hospital immediately. Of these patients 74 (42%) were referred to the diabetic clinic. Table 3 shows how the percentage of patients referred appears to have fallen during the last 10 years. The same trend is shown for those under 65 years at the time of diagnosis.

**Current follow-up**

Table 4 shows the current follow-up of all the patients: 56% were seeing their general practitioner and 46% attended the hospital clinic. These figures overlap so that 22% of patients were receiving dual care and 20% had no regular care at all. The patients most likely to receive dual care were those on insulin, and those least likely to be under regular follow-up were those on diet alone.

**Table 2.** Place of diagnosis of non-insulin-dependent diabetes by presence or absence of symptoms (where known).

Place of diagnosis	Number (%) of non-insulin-dependent diabetics	
	Symptomatic	Asymptomatic
Diagnosed by GP	133 (89)	50 (46)
Diagnosed by hospital staff	17 (11)	58 (54)
All (n = 258) <sup>a</sup>	150 (100)	108 (100)

<sup>a</sup>Presentation was not known for 29 patients.

**Table 3.** Changes over time in percentage of non-insulin-dependent diabetic patients referred to the diabetic clinic after diagnosis by the general practitioner (n = 176).

Age at diagnosis	Percentage of diabetics referred by year of diagnosis		
	Pre 1975	1975-1979	Post 1979
All ages**	67 (35/52)	38 (16/42)	28 (23/82)
Age < 65 yr.*	70 (30/43)	45 (9/20)	36 (18/50)

\*P<0.01; \*\*P<0.001.  $\chi^2$  test.

**Table 4.** Current follow-up of different treatment groups of diabetic patients.

Treatment	Total number of diabetics	Number (%) of diabetics followed up by:			
		GP only	Hospital clinic only	Both	Neither
Tablets	204	96 (47)	44 (22)	31 (15)	33 (16)
Diet alone	83	29 (35)	15 (18)	9 (11)	30 (36)
Insulin	144	19 (13)	46 (32)	56 (39)	23 (16)
All patients	431	144 (34)	105 (24)	96 (22)	86 (20)

**Table 5.** Diabetic patients under regular review by age and treatment category.

Age group (years)	Total number	Number (%) under regular review
<i>Non-insulin-treated patients</i>		
<65	126	101 (80)
65-74	90	76 (84)
>74	71	47 (66)
All	287	224 (78)
<i>Insulin-treated and insulin-dependent patients</i>		
<20	15	15 (100)
20-64	94	74 (79)
>64	35	32 (91)
All	144	121 (84)

When the effect of age on the likelihood of regular review was examined (Table 5), it was apparent that the most elderly non-insulin-treated diabetics (75 years old or over) were least likely to be under regular follow-up. Among the patients receiving insulin, although all 15 patients under 20 years of age were under regular diabetic review, 23 (18%) of those over 20 years were not.

**Outcome of study**

One year after the notes review was carried out, 67 (78%) of the 86 patients who had previously been receiving no regular follow-up had been reviewed by their general practitioners, leaving 19 (4% of all patients) unreviewed; 10 of these patients were insulin-dependent and nine were non-insulin-dependent. Their ages ranged from 28 years to 92 years. Where reasons were given for not coming for review, they included; not missing work (4), fear of doctors (1) and recent deaths in the family (3). Three patients were housebound.

All the practices involved had decided to set up a recall register for their patients with diabetes, and had identified 27 more patients (13 women and 14 men) who would have qualified for inclusion in the original audit; 18 of these patients are non-insulin-dependent and nine are patients receiving insulin. Twenty-two of the patients were under regular review at the time of the audit, and all but one insulin-dependent patient have been reviewed since.

**Discussion**

*Practitioner groups and performance review*

Practitioner groups are becoming an accepted way for general practitioners to overcome professional isolation and to develop critical and creative thinking about their work.<sup>11-13</sup> This project illustrates how they can be used to increase the value of an audit by pooling observations from individual practices.

Although the study group doctors are unusual in attending a monthly meeting to discuss their work, they represent 24 doctors and seven practices, none of which had a special system of diabetic care. The patients in the study comprise about 10% of all known diabetic patients in the Southampton district. The data relating to place of follow-up may thus be broadly representative of the district, and are being used in the planning of diabetic care at this level.

The study was of direct benefit to our patients by identifying those who were receiving no regular follow-up and three who were not diabetic at all. One year after the study most patients

previously receiving no regular care had been reviewed and their doctors were engaged in setting up recall systems for diabetic care in the future. This finding supports the contention that involvement in performance review is a stimulus to improving practice.<sup>14</sup>

### *Classification of diabetes in general practice*

Studies of diabetic care can be difficult to interpret when there is inadequate definition of the disorder. The diagnosis of diabetes should depend on the demonstration of hyperglycaemia according to current diagnostic criteria.<sup>15</sup> When initial measurements are not recorded in case notes, classification has to be based on clinical presentation and subsequent progress. This approach is also required to classify diabetes further into insulin-dependent and non-insulin-dependent types. It is important to classify diabetes into these two groups, since their natural histories differ.<sup>15</sup> Classifying patients according to both initial and current treatments helps to separate patients who are truly insulin- or non-insulin-dependent from those where the clinical type is less clear. In this study we separated out an insulin-treated group which would contain true slow-onset insulin-dependent patients<sup>16</sup> and non-insulin-dependent patients whose blood glucose was not controlled by diet and tablets. It appears that the majority of our insulin-treated diabetic patients fell into the latter group, resembling the non-insulin-dependent group more closely in respect of age at diagnosis, place of diagnosis, mode of presentation and initial blood glucose level. As might be expected, they resembled the insulin-dependent group more closely in respect of the place of present follow-up, supporting the idea that the use of insulin makes it more likely that general practitioners will involve specialist care in follow-up.

### *Diagnosis and follow-up of non-insulin-dependent diabetic patients*

Few studies of diabetes have compared its presentation in hospital and general practice. Our results illustrate the comparative ease of diagnosing symptomatic insulin-dependent diabetes and the difficulty of diagnosing asymptomatic non-insulin-dependent diabetes. Over half the asymptomatic non-insulin-dependent diabetic patients were diagnosed by routine urinalysis on admission to hospital for other reasons. If general practitioners are to achieve earlier diagnosis in this group, they will need to test more of the individuals at risk, for example obese people over 50 years old with a strong family history of diabetes.<sup>7</sup>

General practitioners are taking increasing responsibility for the management of chronic medical disorders in their patients and we found that the proportion of non-insulin-dependent diabetic patients referred to the hospital outpatients at diagnosis was progressively lower among those diagnosed after 1974 than previously. Patients aged over 64 years at diagnosis were also less likely to be referred to hospital than those who were younger. However, even when the older group is excluded, the relationship between date of diagnosis and referral rate remains. We think this reflects a greater willingness among general practitioners in recent years to initiate treatment and follow-up of non-insulin-dependent diabetes themselves. However, it has been suggested that patients who attend a hospital diabetic clinic may live longer than those who remain under general practitioner care.<sup>8,17</sup> Thus more of those under outpatient review might have survived to be included in the present cohort of non-insulin-dependent diabetic patients diagnosed before 1975. A prospective study would be required to elucidate this point, but it is unlikely that the latter effect could explain the whole of the apparent change in referral patterns in recent years.

Non-insulin-dependent diabetic patients in this study were less likely to be referred to hospital at diagnosis or to be under regular

clinical review subsequently than those on insulin. There are many possible reasons for this. Our findings emphasize that the majority of people with diabetes are over 50 years old: older patients may be unaccustomed to attending the doctor without symptoms, and doctors unaccustomed to thinking in terms of preventive medicine for this age group. There may also be a feeling among doctors and patients that non-insulin-dependent diabetes is less serious than insulin-dependent diabetes and easier to manage, perhaps because insulin is not required and lifespan is less curtailed.<sup>2,8</sup> Complications of diabetes, however, occur frequently among non-insulin-dependent diabetic patients<sup>2,18</sup> and add to the existing burden of ill health associated with ageing. In one report 80% of all people with diabetes had a second chronic disorder and 58% had two or more.<sup>19</sup> Coexisting and often symptomatic disorders, such as arthritis, may distract both patient and doctor from routine diabetic care.

In view of evidence of the importance of regular review of diabetics,<sup>8,17</sup> there must be concern that 20% of patients in this audit were not under regular follow-up, even by the broad definition used in this study. Instituting a structured recall system improved the surveillance rate to 96%; the 19 patients still unreviewed were a heterogeneous group who remind us how important the consumers' views are in determining the success of preventive services. Nearly a quarter of patients, however, were receiving an apparent duplication of care from practice and hospital. General practitioners may wish to retain responsibility for patients while at the same time make use of essential resources for diabetic care, including access to dietitians and chiropodists, and prescription of blood glucose monitoring sticks and glycosylated haemoglobin estimations which are not easily available in general practice.

Development of an effective system of diabetic care in a health district will depend on finding solutions to these problems, and also on defining the needs of different subgroups of diabetic patients more clearly. Studies are now in progress to examine the attitudes to diabetes and experience of diabetic care among patients receiving dual care or no regular review, in order to develop a system of care to meet their needs most effectively.

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#### Acknowledgements

We thank our partners, practice managers, receptionists and secretaries for their support in this audit, and we are grateful to Dr Brian Leatherdale and Professor John Bain for their comments on the manuscript and Mrs Jean Gibson for typing and layout.

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## COLLEGE GIFTS

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## Exclusion diets in atopic eczema

Atopic eczema is a common and disabling condition in childhood which may persist into adult life. The cause is not known though numerous aggravating factors and possible aetiological agents have been proposed. Recently, interest has again centred on the aetiological role of dietary factors, but there have been few adequately controlled trials until a double blind cross-over demonstrated that as many as 60% of an unselected group of children with atopic eczema benefited from a diet which excluded egg and milk. Although this work is well known it is still not widely accepted by clinicians and, perhaps as a result of this, patients are often left to experiment with unsupervised diets at home. The aim of this study was to confirm this work, with certain modifications, in children, and also to assess the effect of the diet in older patients.

Fifty-three patients with atopic eczema took part in a double blind controlled cross-over trial of an egg and cow's milk exclusion diet. Response to the diet was assessed in terms of areas affected, day and night time itch, and topical steroid usage. Ten of the 40 patients who completed the trial may have benefited from egg and milk exclusion from their diet. (One additional child was intolerant of the egg and milk and was thus advised to continue with egg and milk avoidance). This is a response rate of 25% which does not confirm any striking beneficial effect from egg and milk exclusion diets in unselected children and young adults with atopic eczema. The best response observed to the diet was in young Caucasians with severe eczema. Older patients, especially with mild eczema, appeared less likely to benefit.

These results suggest that the importance of dietary aspects of atopic eczema has been over-emphasized in the past. An alternative explanation is that an egg and milk exclusion diet *per se* is too limited and that other more relevant food antigens were not excluded. Even soya, used by us as a non-antigenic alternative to cow's milk, is now known to produce allergic reactions. The prescription of an egg and milk exclusion diet on a routine basis in unselected patients with atopic dermatitis is likely to benefit only a few. Properly controlled studies of more rigorous exclusion diets tailored to the patient's needs are urgently required, with open, followed by double blind, challenges of foodstuffs in order to try to define the true role of dietary antigens in the pathogenesis of atopic eczema.

Source: Neild VS, Marsden RA, Bailes JA, Bland JM. Egg and milk exclusion diets in atopic eczema. *Br J Dermatol* 1986; **114**: 117-123.

## Loperamide for the treatment of traveller's diarrhoea

Loperamide hydrochloride was compared with bismuth subsalicylate for the treatment of acute non-dysenteric travellers' diarrhoea in 219 students visiting seven countries in Latin America. Subjects whose condition was not improved with therapy could elect to take trimethoprim-sulphamethoxazole. Persons receiving loperamide passed fewer unformed stools when compared with the bismuth subsalicylate group during the first four hours of therapy, from four to 24 hours, and from 24 to 48 hours after therapy was initiated. Among subjects with disease due to enterotoxigenic *Escherichia coli*, *Shigella* sp, other pathogens and unknown agents, fewer unformed stools were passed by the loperamide-treated subjects than the bismuth subsalicylate-treated subjects for all time periods studied. No significant prolongation of disease was seen in subjects with shigellosis treated with loperamide. Eight of the loperamide-treated subjects experienced constipation compared with one in the bismuth subsalicylate-treated group; otherwise, there was no difference in minor side effects experienced between both treatment groups. The authors conclude that loperamide is a safe and effective alternative to bismuth subsalicylate for the treatment of non-dysenteric travellers' diarrhoea.

Source: Johnson PC, Ericsson CD, DuPont HL, *et al.* Comparison of loperamide with bismuth subsalicylate for the treatment of acute traveler's diarrhea. *JAMA* 1986; **255**: 757-760.