

Effect of structured postgraduate medical education on the care of patients with diabetes

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SUMMARY

Background. Diabetes can be effectively treated and monitored in general practice. Postgraduate medical education at a local level is required to support this strategic shift of medical care from hospital to general practice.

Aim. This study set out to determine whether a structured educational programme initiated by and led by general practitioners, but involving all health professionals, leads to improved care for diabetic patients.

Method. The primary health care teams from 12 of the general practices in Tynedale, Northumberland who attend the local postgraduate centre and refer patients to the local general hospital were involved in the educational initiative which led to a locally agreed protocol for diabetic care. A comparison was made of data for all diabetic patients, registered with the general practitioners in 1991, in the years 1986 and 1991 (before and after the educational initiative) in order to determine the prevalence of diabetes, place of care and treatment received, and to collect clinical information.

Results. More patients received general practice care only or shared care in 1991 than in 1986. There was a reduction in the use of oral hypoglycaemic agents among non-insulin dependent diabetic patients and more patients were maintained on diet alone. A greater proportion of patients were referred to dietitians, ophthalmologists and chiropodists in 1991 than 1986, and there was increased recording of, examination of, and identification of, diabetic complications. Little change was found in the mean values for clinical parameters between the two years.

Conclusion. Structured educational programmes involving all professionals are an effective way of producing protocols that are adhered to by all concerned, and lead to improved clinical care for diabetic patients.

Keywords: diabetes mellitus; quality in general practice; quality of health care; postgraduate education.

Introduction

POSTGRADUATE medical education in the United Kingdom underwent a great change in 1990 with the implementation of the new contract for general practitioners.¹ Regional conferences, and pharmaceutical company sponsored symposia have become commonplace while in other areas local initiatives have been successfully developed (Bradshaw C, personal communication). During the same period local protocols for the care of patients with chronic diseases have become ever more important for setting standards of good care.² An ideal place for the development of such protocols is the postgraduate centre, where medical and paramedical professionals meet.

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It is now generally accepted that diabetes can be appropriately and adequately treated in diabetic clinics in general practice.³⁻⁸ However, other strategies have been described for the care of diabetic patients, including outreach services from hospital or community based services.^{6,9,10}

During the autumn of 1986 the authors started a series of diabetic presentations at a postgraduate medical centre for all local general practitioners, general physicians, and practice and community nurses. Both authors were trainers, used to leading small groups, but had no specialist knowledge of diabetes. A number of different presentations were made including an audit of our own practice's diabetic care, and the results of questionnaires on diabetic care and knowledge that had been completed by all local practices (Appendix 1). Using feedback from the questionnaires and discussion at meetings attended by all types of professionals working in all practices, it was possible to arrive at local consensus protocols for the administrative and clinical care of diabetic patients in general practice (Appendix 2). Deficits in the knowledge of the group as a whole were identified and appropriately addressed. During this initiative six individual practices had presented their own audits of diabetic care to the group.

The aim of this study was to determine whether the initiative achieved an overall change in professional behaviour and set standards which were adhered to, and more importantly whether the initiative influenced the health of diabetic patients.

Method

The area of Tynedale, Northumberland is a sparsely populated rural area to the west of Newcastle upon Tyne. There are a total of 13 practices, varying from single handed to four partner practices, covering 54 500 patients, and 3000 square miles. Over 90% of the referrals of patients for diabetic care are made to Hexham General Hospital, where two physicians provide a consultant led diabetic clinic. All 13 practices were invited to take part in the study. One practice was excluded because of a change of its single handed principal. From the questionnaire surveys carried out during the educational initiative it was known that all the practices could identify all diabetic patients from their records, had a call and recall system for systematic care and 10 practices held diabetic clinics. All practices had stated that they used the local protocols for insulin dependent diabetic and non-insulin dependent diabetic patients set by consensus in the postgraduate medical centre (Appendix 2).

Data were collected in all practices, by a nurse with special training in diabetes, for all patients who had a diagnosis of diabetes on 1 January 1991. Data from two years were compared — 1986 (prior to the educational initiative) and 1991 (two years after the setting of standards). Information was gleaned from all practice records and, if necessary, hospital notes in order to determine the prevalence of diabetes, the place of care and the treatment received, and to collect clinical information.

Results

On 1 January 1991, 668 diabetic patients were registered with the 12 practices (practice population 53 000), giving a prevalence of 1.3%. Of the 668 patients, 328 had also had diabetes in 1986. The increase had been far greater among non-insulin dependent diabetic patients (185 in 1986 to 471 in 1991) than among insulin

dependent diabetic patients (143 in 1986 to 192 in 1991) (type of diabetes not known for five patients in 1991).

More patients received either general practice care only or shared care in 1991 than in 1986 (Table 1). In 1986 75.6% of the diabetic patients had been diagnosed in general practice; by 1991 this had risen to 88.2%. Similarly, the place of investigation had changed, with the majority of patients receiving investigations in general practice — blood glucose level 25.9% in 1986, 71.1% in 1991, glycated haemoglobin A_{1c} 8.5% versus 66.9% and blood cholesterol level 18.0% versus 79.0%.

Changes in treatment patterns were also apparent (Table 1). Of the 192 patients using insulin in 1991, 144 had been on insulin in 1986 (owing to a recording error 143 patients were recorded in 1986 as using insulin, Table 1), two patients had moved from diet to insulin, 13 from oral hypoglycaemic drugs to insulin and 33 were newly diagnosed insulin dependent diabetic patients.

Table 1. Diabetic care in the 12 practices in 1986 and 1991.

	% of patients	
	1986 (n = 328)	1991 (n = 668)
<i>Place of care</i>		
General practice only	35.1	53.9
Shared care	7.0	27.7
Hospital only	52.4	17.1
No data	5.5	1.3
<i>Treatment received</i>		
Insulin	43.6	28.7
Hypoglycaemic drug	43.9	47.0
Diet	12.5	23.5
No data	0	0.7
<i>Referral</i>		
Diabetologist	56.1	43.3
Dietitian	7.3	12.7
Ophthalmologist	12.2	17.8
Chiropodist	5.8	31.6
<i>Data recorded</i>		
Blood glucose	61.9	87.7
HbA _{1c}	13.4	87.4
Blood cholesterol	15.9	59.7
Proteinuria	4.0	4.6
Blood pressure	58.8	72.9
Body mass index	26.8	59.0
Blood urea	23.5	60.0
Skin	29.6	72.5
<i>Complications</i>		
Peripheral arterial disease		
Recorded as examined	23.8	64.2
Identified on examination	5.2	13.5
Neuropathy		
Recorded as examined		
Ankle jerk	15.2	59.3
Ankle vibration sense	15.5	57.3
Identified on examination	2.7	11.4
Coronary heart disease		
Recorded as examined	45.4	72.8
Identified on examination	13.4	17.7
Retinopathy		
Recorded as examined	41.8	74.0
Identified on examination	18.6	29.5
Cataract		
Recorded as examined	47.6	74.1
Identified on examination	6.4	9.3

n = total number of diabetic patients.

There was a reduction in the use of oral hypoglycaemic agents among patients with non-insulin dependent diabetes (77.8% of 185 patients in 1986 versus 66.7% of 471 patients in 1991) and more patients were maintained on diet alone (22.2% in 1986 versus 33.3% in 1991).

The percentage of patients referred to a diabetologist had decreased, but referral to dietitians, ophthalmologists and chiropodists had increased (Table 1). Similarly, history or signs of coronary heart disease, cataracts, retinopathy, peripheral arterial disease and neuropathy were recorded in greater numbers.

The mean levels of clinical parameters in 1991 were little different from those in 1986: blood glucose level 11.2 mmol l⁻¹ in 1986 versus 10.9 mmol l⁻¹ in 1991, body mass index 26.3 versus 27.0, blood cholesterol level 6.2 mmol l⁻¹ versus 5.4 mmol l⁻¹, diastolic blood pressure 83 mmHg versus 84 mmHg, and blood urea level 6.3 mmol l⁻¹ versus 6.7 mmol l⁻¹. The mean level of glycated haemoglobin A_{1c} in 1991 was 9.8%.

Discussion

This study has demonstrated a change in the process of medical care for diabetic patients following a series of postgraduate meetings led by and involving the relevant medical and nursing professionals. Protocols for chronic diseases, such as diabetes, should be developed by consensus between local general practitioners and hospital physicians as ownership of the protocol then resides with each participant rather than being imposed by a diabetologist, committee or hierarchy. The use of the postgraduate centre as a neutral venue for hospital and general practice staff and the use of the educational format to arrive at a consensus protocol was felt by the participating professionals to be a valuable contributing factor to the success of the initiative.

Other factors such as the new general practitioner contract and payment for clinics in chronic disease management undoubtedly influenced the initiative. However, the initiative started four years before the new contract and the individual audits carried out by practices as part of the initiative had already shown considerable change.

The prevalence of diabetes recorded in 1991 compares well with that found in other studies^{6,7} considering the increased disease awareness created by the educational initiative, the increased health promotion activity of the new general practitioner contract, and the increasing age of this rural population. In 1991 approximately 80% of diabetic patients in Tynedale were cared for in general practice, either solely or as part of shared care, a considerable change in the place of care compared with 1986. The greatly improved collection of data for all but one of the parameters measured (proteinuria testing) suggests that the protocols were a direct influence, and were well adhered to. Changes in treatment patterns, especially the increased use of diet alone, indicates the effect of the educative part of the initiative, and the growing confidence of the primary health care team to deal with newly diagnosed non-insulin dependent diabetes effectively themselves.

The rather disappointing mean levels found in 1991 for glucose, glycated haemoglobin A_{1c}, body mass index, cholesterol, diastolic blood pressure and urea must be put in perspective and compared with other studies⁴ which have shown not only comparable results but also the difficulty of achieving an improvement.⁴⁻⁶ However, the clinical awareness in terms of diagnosis and identification of complications did show improvement. A further standard setting exercise has already taken place for the biochemical parameters, which include creatinine and microalbuminuria.¹¹ A two day meeting of all primary health care team members and hospital staff caring for diabetic patients is being held in 1995 to set new more explicit standards.¹²

The consistency of diabetic care in Tynedale has improved as

a result of the initiative described here. Anecdotal comments suggest that the communication between community nursing sisters, practice nursing sisters, general practitioners and physicians has also improved considerably. The initiative has acted as a focus for team building within the primary health care teams with interprofessional communication and cooperation, which appears to have influenced other areas of work as well.

This study has demonstrated that the use of a continuing educational format, which included lectures, demonstrations, open meetings, questionnaires, individual audits and frank discussions, is an effective way of producing protocols that are adhered to by all concerned.

Appendix 1. Stages in the diabetic education programme.

Spring 1987	One practice presents own audit of diabetic care. Stimulation to all practices to examine their diabetic care.
October 1987	Second practice presents own audit of diabetic care. Questionnaires to all practices on their administration for diabetic patients and on the care of three hypothetical diabetic patients.
March 1988	All practice discussion meeting. Consensus/protocol agreed. Policy changes within practices. Meeting to set management and clinical standards. Challenge to all practices to improve their care. Education meetings led by a diabetologist, an ophthalmologist (on diabetic retinopathy) and a dietitian (on healthy eating and the literature available).
October 1988	Audit of four practices. Questionnaire to all practices.
October–December 1988	Further protocol refinements and agreement. Protocol circulated by C H.
1991	More educational meetings. Diabetic audit.

Appendix 2. Tynedale consensus protocols for the care of diabetic patients.

Administrative care

Each practice will be able to: identify all diabetic patients from records; identify all insulin dependent diabetic patients; identify all non-insulin dependent diabetic patients; identify place of care, that is whether patient receiving consultant care, shared care, or general practitioner care; and identify defaulters. Each practice will have a recall system.

Clinical care

Insulin dependent diabetic patients

- At diagnosis by general practitioner, immediate referral to consultant should be organized.
- Follow up should be every 3–6 months as clinically appropriate at general practice or hospital clinic.
- Every three and six months the following should be checked: blood glucose level; urine for glucose/protein; weight; diet; and injection sites.
- Each year the following should be checked: blood pressure; glycosylated haemoglobin A_{1c} level; optic fundi; renal function; peripheral arteries; skin; and visual acuity.

Non-insulin dependent diabetic patients

- At diagnosis, general practitioner care or consultant care should be organized.
- Initial assessment by general practitioner should include: clinical examination; and checks of visual acuity; optic fundi; blood pressure; peripheral arteries; full blood count; urea and electrolyte levels; blood glucose level; and glycosylated haemoglobin A_{1c} level.
- Further care by general practitioner with referral to another professional if necessary.

- Every three and six months — same checks as for insulin dependent diabetic patients.
- Each year the following should be checked: urine for glucose/protein; glucose level, glycosylated haemoglobin A_{1c} level; weight; optic fundi/visual acuity; and renal function/peripheral arteries, skin and nervous system.

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