PRACTICE OBSERVED

The GP and the Specialist

Diabetes mellitus

P J WATKINS

Diabetes is very common—it affects about 600 000 people in Britain—and doctors in every specialty inevitably have some diabetic patients in their care. The clinical presentation and principles of diagnosis and management of diabetes are very well known, yet elementary omissions are frequent, resulting at the very least in unnecessarily protracted symptoms on the one hand, to death from ketoacidosis at the other extreme. These errors, seen, of course, from the security of a diabetic clinic, occur not only in general practice but also in many hospital specialist departments.

This article describes some of the common errors that occur in the diagnosis and treatment of diabetes, together with some comments on facilities that should now be available in diabetic clinics to offer the best standards of modern diabetic care.

Diabetes is often missed—why?

Thirst, polyuria, and weight loss are classic symptoms of diabetes, yet the diagnosis is often missed. Of course, patients frequently do not present to their doctors with these very words, but with gentle inquiry the clues are usually there—and a very simple urine test always reveals the diagnosis. "Polyuria" is often overlooked; thus instead of testing the urine, patients with urinary frequency are treated with antibiotics as if for urinary tract infections, while young patients with enuresis and old ones with incontinence are given other forms of treatment. The classic symptoms of pruritus vulvae and balanitis are frequently treated with creams and ointment, sometimes for months before the urine is tested, and gynaecologists and urologists are not exempt from this failing. Even the thirst of diabetes is not always observed, notably because many patients complain of a dry mouth rather than thirst, and even that seems insufficient sometimes to evoke the right response—test the urine.

Some patients present with weight loss only. In the absence of any very obvious cause these patients should always have a urine test; yet complex radiological examinations and other tests are often performed first. I have even seen two teenage girls sent to a psychiatrist for treatment of anorexia nervosa before their admission in ketoacidosis. Perhaps one of greatest merits of the multichannel biochemical analysis is the inclusion of blood glucose concentration, which is so often the means by which diabetes comes to light—but the very complexity of surveying 20 or more numerical results means that hyperglycaemia is easily overlooked, sometimes for years.

Lethargy and tiredness are common in uncontrolled diabetes and rapidly reversed by its treatment. When patients present with these symptoms alone, diabetes is not often considered as a diagnosis—and small wonder, with so many others declaring similar symptoms. The relief of this symptom by treatment is considerable, and it is a pity to miss the diagnosis.

Ulceration and sepsis of the feet are usually due to diabetic neuropathy and may be the presenting feature—test the urine! Declining vision from retinopathy may lead to the discovery of diabetes. Rapid onset of myopia is another presentation of diabetes simply from altered refraction.

The plain message must be this—if the patient's symptoms of whatever nature have not been accounted for, test a urine sample (fig 1).

How urgently does the patient need treatment?

The discovery of glycosuria usually means that the patient is diabetic, though the diagnosis must be established by measuring blood glucose before treatment is started. How urgently must action be taken? Diabetic patients are now classified as insulin dependent diabetics (IDDs) or non-insulin dependent diabetics (NIDDs). IDDs need urgent diagnosis and treatment, while NIDDs usually do not. How are IDDs identified?

Diabetic Department, King's College Hospital, London
P J WATKINS, MD, FRCP, consultant physician

IDDs usually present with classic symptoms of diabetes, and thirst and weight loss are prominent. Their lips and tongue may be "tacky" and make speech difficult. They are often (but not always) thin. They complain severely of tiredness and weakness. Most children and young adults are IDDs, but very old people also develop acute and severe insulin dependent diabetes. The presence of ketonuria is also helpful in drawing the distinction. IDD patients should be diagnosed and treatment started within 24 hours. When in doubt—start insulin.

Ketoacidosis with or without vomiting is always an indication for urgent attention—immediate hospital admission and insulin treatment. About a fifth of all cases of ketoacidosis occur in new and previously untreated diabetics. In the ideal world this hazardous condition should rarely occur: most patients presenting in this may have attended their doctors in the preceding days or weeks—often more than once—and the diabetes missed.

FIG 1—From a fifteenth century Greek manuscript.

Never stop insulin

Every medical student is taught that insulin, once started, should never be stopped. The body requires a basal concentration of insulin if normal metabolism is to continue and this insulin is needed *even in the fasting state*. If insulin is withdrawn hyperglycaemia and ketoacidosis are inevitable and can occur very rapidly over a few hours, especially when there is infection or other illness.

Why then are so many patients instructed to reduce or even stop their insulin if they feel unwell, or when they start to vomit? About one fifth of all cases of ketoacidosis occur as a result of this advice, and a few deaths undoubtedly follow. Insulin *must* be continued at all times; during illness *more* (not less) insulin is needed to avoid ketoacidosis. A simple written instruction including this advice should be given to all diabetics taking insulin (fig 2).

Managing diabetes during illness

Patients must be instructed to continue to take their normal insulin dose. Carbohydrate is taken in fluid form if only fluids can be tolerated. Regular urine or blood testing is needed, sometimes several times during the day. If tests remain unsatisfactory extra soluble insulin (approximately 8 units) is given at noon, and another extra dose repeated in the evening if necessary. If vomiting persists or deterioration progresses there is no alternative to immediate hospital admission.

KING'S COLLEGE HOSPITAL—DIABETIC DEPARTMENT

ILLNESS AND INFECTION

During illness or infection your blood sugar level may rise, causing you to feel dry, thirsty and pass too much urine. Urine tests may become sugary (2%) every time.

You **MUST** continue to take your normal insulin dose. **NEVER** stop it. You may need an increased dose if your urine tests are bad. If you are vomiting, consult your Doctor or the Diabetic Clinic at once. If you are unable to eat, take your carbohydrate portions in liquid form—*e.g.* milk, Lucozade, Ribena.

Test your urine twice a day or even more frequently.

If you continue to feel unwell, consult your Doctor.

KCH 330

The diabetic clinic—what can it offer?

The diabetic clinic is a much criticised institution. Interminable waiting for brief interviews by debilitated patients is the traditional picture. The modern diabetic clinic may still suffer some of these defects, but a good clinic takes a very positive approach to control and complications that cannot be offered in any other environment. Apart from routine measurement of weight, blood glucose concentration, sometimes haemoglobin A1, and a urine test, dietary advice and other proper educational facilities including instructions on blood glucose monitoring are needed. There should be proper services for the care of the eye and foot. Children, adolescents, and pregnant women are special cases that also come under the umbrella of the diabetic clinic.

These services can be offered only in an environment devoted to the care of diabetic patients and staffed by doctors and nurses who are both interested and expert in their care. Such an environment can be established either in hospital or by a general practitioner. Failure to provide special facilities usually results in neglect of diabetic patients, as several studies have shown. Once a clinic has been established clinic staff need to keep in contact with each other—that is, the GP, liaison nurse, and hospital—and with new developments in management. Of course, some of the specialised aspects of diabetic care should probably only be managed in hospital—for example, care of pregnant diabetics.

DIABETIC NURSE

No diabetic clinic, either in hospital or in general practice, should now be without a specially trained nurse. In recognition of this, the Joint Board of Clinical Nursing Studies now issues a certificate after attendance at appropriate courses. The expertise such nurses offer to individual patients is incalculable, and they provide the essential link between hospital and home.

COMPLICATIONS OF DIABETES

A major part of diabetic care, wherever it is undertaken, is now devoted to attempts to prevent complications as far as possible. Good control of diabetes has become an important aspect of this attempt, but in some instances early detection of

KING'S COLLEGE HOSPITAL – DIABETIC DEPARTMENT

CARE OF YOUR FEET

To help prevent complications: –

DO
- wash daily with soap and water.
- dry well, especially between toes.
- change socks/stockings daily.
- see that your shoes are not too tight.
- see a Chiropodist.

DON'T
- walk barefoot.
- sit too close to a fire or radiator.
- put your feet on hot water bottles.
- neglect even slight injuries – see your Doctor.
- attempt your own chiropody – see your Chiropodist.

KCH 247

problems leads to their prevention, especially with regard to neuropathic lesions of the foot and early appearance of retinopathy. These observations form an important element of work in diabetic clinics.

Neuropathic foot ulceration—This is a common problem in long-term and older diabetic patients, and leads to sepsis, osteomyelitis, formation of abscess, digital gangrene, and amputations. With proper preventive care these complications can often be avoided. Foot care is one of the essential services offered by a diabetic clinic. Every diabetic should receive simple written instructions: we give all our new patients advice on a postcard (fig 3). Regular foot inspection and chiropody is often vital in preventing ulceration. The formation of callus at pressure points sometimes occurs with astonishing speed (a few weeks) and infection and ulceration frequently follow. Fitting of special shoes that accommodate awkward protuberances is an important facet of preventive care, and a shoe fitter now attends our diabetic foot clinic.

Retinopathy—Photocoagulation for diabetic retinopathy is now an established treatment which is often successful in preventing blindness. The emphasis is on prevention—established blindness can rarely be reversed. Retinal lesions that need treatment must be discovered *before* vision deteriorates. This means in practice that the fundi must be examined regularly through dilated pupils, and visual acuity needs to be checked as well. An annual eye examination is ideal, but more frequent examination is required if retinal lesions are present, and the rule may be relaxed a little if no lesions have ever been found. The lesions that should be particularly sought are (*a*) new vessels, especially where they form on the optic disc; and (*b*) hard exudates forming close to the macula. An annual visit to an optician is most valuable: if proper records are kept any appreciable change of visual acuity is readily detected in this way. Some opticians now co-operate in special schemes to detect retinopathy.

Conclusions

Enthusiasm and interest in the care of diabetic patients, together with proper organisation, are the essential qualities needed to guide patients through a lifetime of their disability. Close co-operation between general practitioner, liaison nurse, and hospital is needed to provide the best care. The sheer size of the problem led Professor John Malins to describe work at the "pit face" of the clinic (1968), while Dr Elliott P Joslin observed that "to retain his patient for 20 years he (the physician) must . . . continually seek for new knowledge as eagerly as the diabetic grasps for life" (1935); and about the same time Dr R D Lawrence, with his distinguished patient H G Wells, founded the British Diabetic Association (1934) to which diabetics and those who care for them should now belong.

Diary of Urban Marks: 1880-1949

I then decided to sit for the entrance scholarship in natural science at St Mary's. This took place in September, and sitting with me was Bernard Spilsbury, now pathologist to the Home Office and a knight. He obtained the university scholarship. I obtained an exhibition worth £25. On returning to hospital and making inquiries from the dean I was told that in chemistry and physics I was outstanding. In botany I had done a floral diagram instead of a floral formula, with the result that no marks were given to me for that answer and I was bracketed equal with Singer, who is now professor of history of medicine at Oxford, for the exhibition of £50. Still, I had achieved something, and it was very gratifying that I took the Chemistry Prize of two guineas and that Dr Ridewood asked me to take on the office of demonstrator in biology.

The session commenced on or about 1 October, and while acting as demonstrator in biology I started on anatomy and physiology with a view of taking the intermediate MB in two years. The first body on which I commenced dissection was that of a black man. All people dying unknown in the London hospitals or workhouses were passed on to the medical schools so that the students could study anatomy. The femoral arteries were cut and by means of a pump a mixture of red lead and formalin was injected into the corpse. The formalin preserved the flesh while the red lead showed up the arteries. It was rumoured that the black man had been shipped over from South Africa where the Boer War was raging at that time. I do not know whether this was true. He was the only black man I came across in the anatomy room. One thing I learned immediately—that under his skin the black man is made exactly as every other human being. I remember being allotted the thigh to dissect. I felt that I could not go on with the work, but I remembered that I would have to conquer many repugnancies before I became qualified. I shut my eyes and with the scalpel in my hand I made a dig into the corpse. My horror of it all fell away like magic, and ever afterwards I was able to throw pieces of dead meat or skulls about as well as any of my confreres. Horseplay of that kind was quite common.

INFLUENCE OF MUSIC ON THE MOUSE "One evening, in the month of December, as a few officers on board of a British man-of-war in the harbour of Portsmouth were seated round the fire, one of them began to play a plaintive air on the violin. He had scarcely performed ten minutes when a mouse, apparently frantic, made its appearance in the centre of the floor, near the large table which usually stands in the ward-room, the residence of the lieutenants in ships of the line. The strange gestures of the little animal strongly excited the attention of the officers, who, with one consent, resolved to suffer it to continue its singular actions unmolested. Its exertions now appeared to be greater every moment: it shook its head, leaped about the table, and exhibited signs of the most ecstatic delight. It was observed that, in proportion to the gradation of the tones to the soft point, the ecstacy of the animal appeared to be increased, and *vice versa*. After performing actions which an animal so diminished would, at first sight, seem incapable of, the little creature, to the astonishment of the delighted spectators, suddenly ceased to move, fell down, and expired, without evincing any symptoms of pain." Facts somewhat similar to the preceding, but not (that I know) so circumstantial, are recorded by different authors. Linnaeus notices the circumstance in two words. Speaking of the common mouse (mus musculus) he says, "delectatur musica"—*Systema Naturae, &c* tom: I p 83, No 13 Gmelin, in his edition of the System, omits this part of the history of the animal. (Medical and Philosophical Intelligence. *The Medical and Physical Journal* 1818;**40**:257.)

The GP and the Medical Student

Teaching students in an Aberdeen practice

F P HOWARTH

General practice is now used as a teaching forum for all disciplines in the primary health care team. A practice can expect to be asked to take students from many courses, including secretarial, reception, nursing (both district and treatment room), midwifery, health visiting, and social work. Historically, however, teaching medical students has been most common. This has taken on a new emphasis over the past decade with the confirmation of general practice as a specialty and its promotion to degree examination status for the final MB, ChB. There has been a corresponding change in attitude by undergraduates towards general practice as a career, with many more now making it their first choice.

Three years ago we were asked to take final-year medical students from the medical school at Aberdeen University. During this year the students are allocated a four-week attachment to the university department of general practice. Their first day is spent in the department where they are briefed on the aims and objectives of the four-week programme. The following day they join their "host" practice, where they remain until the final two days; these are again spent in the department, culminating in a seminar on the final morning to which all the students and general practitioners are invited. The practice is asked to take a maximum of three students a year, for which an honorarium of £50 per student is paid by the university. Unfortunately, there are no facilities for residential accommodation for the students.

Having accepted the invitation to take students into our practice we were thoughtfully provided with a set of "Guide Notes" that set out the following objectives:

(1) Clinical

(*a*) To widen the student's knowledge of the spectrum of illness by showing him the clinical conditions—minor and major, physical and emotional, acute and chronic—that make up general practice.

(*b*) To demonstrate the common diagnostic and therapeutic problems that occur in the early stages of illness, and to show how the doctor-patient relationship often differs in general practice from that in hospital.

(2) Sociomedical

(*a*) To show the student how the clinical, personal, and social aspects of disease interact with each other. The student will see for himself how families and their doctor cope with illness and terminal care, with the more intimate personal problems, and with the requirements of continuing care.

(*b*) To give the student an understanding of the role of other community health services in the prevention and management of illness.

(3) Vocational

The student should know something about the opportunities, rewards, satisfactions, and difficulties of general practice today; how its organisation is likely to change in the next 10 years; and the probable future pattern of training for the specialty of general practice.

Organising for students

Ours is a semirural practice with four principals working from a purpose-built health centre on the outskirts of Aberdeen. The health centre is rented from the Grampian Health Board and is shared with another group practice. We run a branch surgery three miles away and look after a total list of 7600 patients. The practice employs three full-time and six part-time staff, including a practice manager, and has community staff attached, including district and treatment-room nurses, a midwife, and health visitors. A physiotherapist and a dietitian provide one session a week at the health centre.

Because it was limited it became evident that the time the student spent in our practice needed to be structured if the objectives were to be met, and to this end a timetable was prepared (table).

Week 1—For these first few days the student is mainly an observer. He spends his time with one doctor, sitting in at his surgeries and accompanying him on home visits. When appropriate he joins the doctor when on call. Three afternoon sessions are left free to enable a relationship to be formed with the student and to assess the more obvious needs of that student. These sessions also allow informal tutorials on the organisation and administration of general practice, including the financial and other aspects of being self-employed. The student is offered a half-day on Thursday afternoons—yet to be refused.

Weeks 2 and 3—During this fortnight the student accompanies each of the other partners in their surgeries and on home visits. Time is also allocated to enable the student to be with other members of the primary health care team, including one entire day with the practice manager and reception staff. Three afternoon sessions are again available to allow informal tutorials and topic teaching—for example, management of patients with asthma or diabetes in general practice, managing patients who are terminally ill at home—or case discussions. The Thursday morning surgery is spent with the first doctor and the student is allowed to run his own surgery if he wishes.

Week 4—In his final week the student rotates among each of the partners for surgeries and home visits. Two afternoon sessions are again allocated for free ranging discussions on subjects of the student's choice, or to allow time for follow up of

Dyce, Aberdeen
F P HOWARTH, MB, MRCGP, general practitioner