Community Clinics in Clinical Pharmacology

Maturity-onset diabetes

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Problem

A 57-year-old clerk who has only recently moved into the area has had angina pectoris for five years and is well controlled on a combination of propranolol, 80 mg thrice daily, and occasional sublingual glyceryl trinitrate. He came to see me five days ago complaining that he had lost 7 kg over the past year, but had no other symptoms. On examination he had glycosuria (1% on Clinitest) but no ketonuria or evidence of diabetic retinopathy. His peripheral pulses were normal. A chest radiograph, full blood count, and erythrocyte sedimentation rate were all normal but a fasting blood glucose concentration was 13 mmol/l (234 mg/100 ml).

Should I do an oral glucose tolerance test to confirm the diagnosis of diabetes, and what treatment should he start?

Advice

Glycosuria and fasting hyperglycaemia of this degree (above about 7 mmol/l) mean that this man has maturity-onset diabetes, and a glucose tolerance test would be pointless.

Your therapeutic "goal" in maturity-onset diabetes should be to produce and maintain normoglycaemia. Firstly, since his blood sugar concentration is not particularly high and he is not underweight, I would start him on a reduced carbohydrate diet. I use a so-called "sugar-free" diet that avoids certain foods and substitutes artificial sweeteners for sugar. It provides 1200-1500 kilocalories a day and is usually satisfactory provided you explain to patients what you are doing, and warn them against

substituting bread, honey, and potatoes for the carbohydrates you have removed. I realise that it may seem illogical to institute diet restrictions for a patient who has already lost a substantial amount of weight, but carbohydrate restriction may well control his diabetes.

If he cannot be controlled on diet alone, I would suggest you add a sulphonylurea hypoglycaemic agent. There are many to choose from but they all appear to have similar pharmacological actions (increased pancreatic insulin secretion and reduced hepatic glucose output) and differ only in potency and half life. I prefer glibenclamide at a single daily dose of between 2.5 mg and 15 mg, starting with a low dose and increasing cautiously if necessary. Tolbutamide is a less potent drug with a short half life and needs to be given frequently while chlorpropamide—with its long half life—may produce prolonged hypoglycaemia. Chlorpropamide may also cause intolerance to alcohol—giving rise to unpleasant and uncontrollable facial flushing—after even relatively small quantities, and glibenclamide lacks this action. Great care must be exercised when any sulphonylurea is used in patients with renal impairment, and if this is appreciable the drugs are best avoided because of the risk of hypoglycaemia. They are also best avoided in very obese patients.

In general, the decision whether you need to add a sulphonylurea, and what dose to use, should be based on three criteria. Firstly, symptoms of hyperglycaemia (or hypoglycaemia) are a valuable guide to monitoring treatment. Secondly, urine testing for glucose—though only of limited value for patients on insulin—is of special use in monitoring progress in maturity-onset diabetes. Finally, random blood glucose measurements provide an additional means of ensuring the adequacy of control. In this patient I have already said that your therapeutic goal should be normoglycaemia, and you should therefore aim at relieving his symptoms completely, maintaining his weight, eradicating glycosuria, and bringing his blood glucose concentration back to normal. In elderly and frail patients, however, particularly those living alone, you may have to settle for symptomatic control, and accept some glycosuria and hyperglycaemia.

The other group of oral hypoglycaemic drugs—the biguanides (metformin and phenformin)—are of more limited value. They appear to increase the peripheral utilisation of glucose in the presence of insulin. They are of some use in two conditions:

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for the obese, non-ketotic diabetic their anorectic action may be valuable when combined with dietary restriction, and, secondly, they are occasionally helpful as additional hypoglycaemic treatment in patients who have an inadequate response to carbohydrate restriction and a sulphonylurea alone. Their main danger is of precipitating lactic acidemia, and they are particularly apt to do so in renal and liver diseases and hypoxic states. Epidemiological studies indicate that phenformin is much more likely to provoke lactic acidemia than metformin, and I have now stopped using the former completely. I must emphasise that in the obese diabetic, diet alone should be the first treatment—weight reduction is vital.

Certain drugs may interact with oral hypoglycaemic agents. Beta-blockers, which may potentiate hypoglycaemia, may also mask hypoglycaemic symptoms and signs, and this interaction is obviously important with this patient. I would suggest therefore that you monitor his treatment particularly carefully, but there is no reason to stop his propranolol. Phenybutazone,

azapropazone, and clofibrate may also potentiate the hypoglycaemic effect of sulphonylureas.

Two final points. One, when he has been stabilised on an appropriate regimen, I suggest that you continue to monitor his progress at regular intervals for an indefinite period: you may find that his control deteriorates, or perhaps that he can stop drug treatment. Secondly, I never myself persevere with diet, sulphonylureas, and biguanides if it is obvious that a patient is not being controlled—in these cases I start insulin unless age and circumstances make this impracticable.

Postscript

The patient failed to respond satisfactorily to a "sugar-free" diet alone, but with the addition of glibenclamide, 5 mg daily, his weight is now steady. His urine is free from glucose, and random blood sugar concentrations are within normal limits.

Letter from . . . Brunei

A whiff of frangipani

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I have just turned off the air-conditioning to listen to a faint fetal heart. The electric fan stirs the pile of detailed notes on the patient's seven other pregnancies, the carbon paper I use when referring cases for ultrasound scans flutters to the floor. The trim health sister in spotless white helps the patient to rearrange her gaily coloured clothes; the nurse translates for me; and we discuss the need for more iron, for worm treatment, for hospital confinement, and for a better diet. The patient wraps her sarong expertly and walks with dignity to see the sister, arrangements are made for transport to take her for her blood tests in the hospital, and for the midwife to visit her next week to check on that elusive fetal heart.

All in the day's work

Outside, there is a large brilliant crimson hibiscus, a banana tree, and a waft of frangipani scent. Today I shall see 40 of the 100 patients attending the clinic. This rural clinic is a substantial wooden house on stilts, with spacious waiting room and good consulting facilities, and a staff of sisters, nurses, midwife, and clerk. Tomorrow I shall climb into a helicopter to visit a clinic way up a fast-flowing river in the jungle—where the patients will come by boat, or walk through the jungle expertly balancing on narrow log bridges. Yesterday I was in the water village on stilts where 30 000 people live and where many are born and die, go to school, shop, and see the doctor.

This evening there will be a clinical meeting in the hospital attended by doctors, technicians, nurses, and other health staff.

We may have a lecture from a visiting British consultant doing a locum job here.

The pathologist will finish his work for the day and his computerised record cards will be filed for distribution. He will hope to complete plans to get one of the technicians further training in Britain or elsewhere. The radiologist usually joins the group going to the meeting. He will have had a busy day visiting a second hospital 50 miles away, and he will be thinking cheerfully of the plans he and his wife are making to go water skiing and sailing at the weekend. Friends tried to make him play golf at a glorious course near the sea, others tempted him with tennis and squash, but the boat won. As we talk, we remember we are all due for our six-monthly cholera jabs and muse on the cholera- and malaria-free state of the country and the efficient immunisation programme organised for children by the Medical Officer of Health. As a result, the country is full of healthy young people. I admire the vigorous football played everywhere in 85° F.

Over tea and curry puffs before the meeting, talk will probably move from the topic of the new hospital—due to open in a few years' time—to the need for a second school doctor to help with the big task of identifying and measuring disabilities, to advise on what special facilities should be provided and the need for a paediatrician for preschool child care. Clinical problems will then be presented and discussed: sometimes they will include rarities such as the Wolff-Parkinson-White syndrome or "salaam" attacks that were first found by general duty doctors in their big hospital outpatient clinics (reminiscent of pre-NHS casualty departments, and urban general practitioner surgeries).

Blend of ancient and modern

When the meeting is over, we will leave the old complex of wooden shingled bungalows which make up the 300-bed hospital full of patients receiving modern medical care and relatives waiting and watching. Cascades of water from the