Long term follow up of women who have had gestational diabetes

WOMEN diagnosed as having gestational diabetes are at considerable risk of developing non-insulin dependent diabetes later in life and one follow up study has suggested the risk may be approximately 60%.[1] Non-insulin dependent diabetes may go undiagnosed for months or even years and multiple complications may already have become established by the time the patient presents.[2] Some of these complications could be minimized if treatment was started earlier. There is, therefore, an argument for the long term follow up of women who have had gestational diabetes in order to detect non-insulin dependent diabetes in its presymptomatic phase.

Women with gestational diabetes are usually seen by the diabetologist only once six weeks after the birth to confirm that their glucose tolerance has returned to within normal limits. Care may then be transferred back to the general practitioner with no formal guidelines for future management. Data from O'Sullivan's study[1] suggest that after five years approximately 15% of these women will have developed non-insulin dependent diabetes. After 23 years, the figure is approximately 60%.

There is considerable controversy over the definition and biochemical diagnosis of gestational diabetes.[3] A protocol used in the United States of America simply distinguishes 'normal' from 'glucose intolerance'[4] while the World Health Organization criteria have three categories — 'normal', 'impaired glucose tolerance' and 'diabetes mellitus'.[5] World Health Organization criteria for the diagnosis of impaired glucose tolerance include a fasting venous plasma glucose level of less than 7.8 mmol l^{-1}, and a venous plasma glucose level of between 7.8 and 11.1 mmol l^{-1} two hours after 75 g oral glucose. A diagnosis of diabetes mellitus is made if the fasting venous plasma glucose level is greater than 7.8 mmol l^{-1}, and greater than 11.1 mmol l^{-1} two hours after 75 g of oral glucose. However, some diabetologists use lower thresholds for introducing dietary restrictions during pregnancy. A protocol used in the USA screens all pregnant women between 24 and 28 weeks' gestation.[4] A 50 g dose of oral glucose is given and a single blood sample is taken after one hour. If the venous plasma glucose level is 8.3 mmol l^{-1} or more, a three hour 100 g oral glucose tolerance test is performed. The patient is considered to have normal glucose tolerance if she is found to have a fasting venous plasma glucose level of less than 5.8 mmol l^{-1}, a glucose level of less than 10.5 mmol l^{-1} after one hour, less than 9.2 mmol l^{-1} after two hours and less than 8.1 mmol l^{-1} after three hours. If two higher values are recorded, the diagnosis of gestational glucose intolerance is made. However, there is controversy over whether all pregnant women should be screened in this way, and whether the initial screening measurement should be lowered from 8.3 mmol l^{-1} to 7.2 mmol l^{-1}.

Difficulties now arise for research attempting to demonstrate the benefits of antenatal screening for gestational diabetes, as it would be unethical to withhold treatment from a control group of women found to have gestational diabetes. Retrospective studies suffer from problems of finding groups adequately matched for age, parity, obesity and severity of glucose intolerance. Evidence is therefore inconclusive that intervention (insulin therapy and/or dietary restrictions) during the index pregnancy is of benefit in terms of reduced maternal morbidity and mortality and reduced perinatal mortality. Nevertheless, high infant birthweight is associated with gestational diabetes, excess morbidity being associated with birthweights of 4.5 kg or more. Treatment for gestational diabetes results in a statistically significant reduction in birthweight. These issues are discussed in detail by Ales and Santini in their review of the literature.[6]

To what extent can the natural history of diabetes be altered? Poor control of blood sugar levels is believed to be responsible for the development of microvascular complications, such as retinopathy, whose incidence and progression have a demonstrable relationship with glycosylated haemoglobin levels.[7] Once retinopathy is established, its progression may continue despite well controlled blood sugar levels.[8] Those who present with advanced retinopathy might have had their vision spared by early laser therapy.

Mechanisms other than hyperglycaemia may be involved in the development of macrovascular complications. Evidence suggests that the lack of association between these complications and either disease duration or level of control may be due to metabolic abnormalities which may have begun years before the development of diabetes itself.[9] The abnormalities include impaired glucose tolerance, hyperinsulinaemia, hypercholesterolaemia, hypertriglyceridaemia, hypertension and obesity. Whether the treatment of such factors improves outcome remains an area of controversy[10] and further study is needed. Interestingly, the women with gestational diabetes in O'Sullivan's study also had a higher incidence of hypertension and hyperlipidaemia at follow up compared with the control group.[1]

The recent use of angiotensin converting enzyme inhibitors for diabetic patients with microalbuminuria[11] is further evidence of the benefits of early intervention for long term outlook, although so far only patients with insulin dependent diabetes have been studied.

How should long term management be arranged for women with gestational diabetes? National guidelines for follow up are needed, taking into account the issues discussed, together with factors such as available resources and the possible adverse effects of long term medical attention on the self image (and life insurance risk) of asymptomatic women.

The number of women involved would depend not only on the biochemical criteria used for the original diagnosis, but also on the criteria used to select pregnant women for glucose tolerance testing. Factors such as a personal history of glycosuria, previous heavy infant, stillbirth or miscarriage, pre-eclampsia, premature birth, hydramnios, congenitally abnormal infant, or a family history of diabetes would produce a high number of potential candidates for screening. Greater consensus on glucose tolerance testing in pregnancy would enable women at high risk to be identified more accurately and long term outcome analysis would be more meaningful. Universal screening would be a move towards this but has its own financial implications.

Follow-up investigations to detect the onset of non-insulin dependent diabetes also need consideration. Ideally, a two hour oral glucose tolerance test could be done annually, or as a compromise, three yearly at the routine medical check. Less expensive and more convenient options include a single venous plasma glucose measurement following an oral glucose challenge or a single fasting venous plasma glucose measurement. These women would also need to have their blood pressure and fasting lipid levels checked on a regular basis, and the importance of maintaining ideal weight and avoiding smoking should be stressed. The use of diabetogenic drugs, such as thiazide diuretics, should be avoided if suitable alternatives are available.

It is debatable whether these women should be on a diabetic diet before diabetes is biochemically demonstrable. A survey in Aberdeen[12] followed for a mean of 12.9 years a group of women diagnosed as having gestational diabetes who were put on a diabetic diet indefinitely. Only 6.4% of them developed overt diabetes but unfortunately there was no control group in this study for comparison.

In conclusion, the measurement of glucose tolerance in pregnancy, whether universally or in selected patients, enables a group of women to be identified who, over the following decades, are at substantial risk of developing non-insulin dependent diabetes. This diagnosis produces considerable morbidity and mortality as a result of complications which may be amenable to presymptomatic treatment. In addition, there is an association with hypertension and hyperlipidaemia, both of which may precede the development of hyperglycaemia. While a consensus on follow-up policy requires further assessment of feasibility and outcome analysis, general practitioners should ensure that the benefits of modern preventive approaches are available to women with gestational diabetes.

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The case for a primary health care authority

FOLLOWING closely on the many changes already taking place within the National Health Service comes the suggestion for further change in the structure for the delivery of primary care. The NHS Management Executive has commissioned two documents which set out the various options.[1,2] A further document looks at the relationship between primary and secondary care.[3]

Tension exists at the moment between the perceived need for consolidation, calling a halt to further change, and the perceived need to seize the opportunity to develop a sensible structure to fit the process of primary care. The definition of the process of primary care is crucial in determining what sort of structure should be developed. From the general practitioners' perspective, it would seem useful to examine what sort of work they are involved in and with whom they work most closely.

For the patients on their list general practitioners provide population based care and care on a personal level. They provide acute, continuing and often palliative care as well as a range of health promotion and illness prevention measures.[4] Health promotion and the care of increasing numbers of elderly people in the community are now key issues in general practitioners' work.[5] Not only do general practitioners provide primary care, they obtain (or as fundholders, purchase)[6] secondary care by referring patients to hospital specialists or open access departments. Patients in turn are received back into the community, where they may be given further care from general practitioners. This spectrum of care is delivered by a team of individuals, with help from patients' carers, and increasingly by social services and voluntary organizations.

Currently, general practitioners are independent contractors, working alone or in groups in contract with a family health services authority. Usually they employ receptionists, secretarial staff, managers and practice nurses. Other professionals, such as district nurses and health visitors, are attached to practices, but employed by and accountable managerially to a district health authority. Increasingly, other professionals, such as dietitians, psychologists and physiotherapists, are being incorporated into the team on a similar basis. Fundholding practices now have the potential to employ previously attached professional staff. It is this group of individuals working together which traditionally constitutes the primary health care team. Care is usually delivered in or close to the patient's home without much delay. The majority of patient problems within primary care are dealt with by the primary health care team without referral to secondary care.[7]

In the main, the delivery of primary care through the primary health care team and the referral system has served the NHS and patients well. Only those patients who cannot be managed in primary care or who require specialist services are referred to secondary care. Unnecessary referrals are minimized and the system allows the two elements, primary and secondary care, to collaborate in the interests of patients. Secondary care supports primary care but should not duplicate it. If the referral process were to be abolished, costs could rise in an uncontrolled way.[8]

This is the current scene for much of the work of primary care and its relation to secondary care. Clearly, patterns vary across the geographical and social spectrum. Any new structure that embraces primary care must take note of the work of the primary health care team and the referral process. It should place the needs of the patient at the top of the agenda. The structure needs to be flexible enough to cope with further development and must build on those existing strengths and seek to improve them.

Potentially the primary health care team has great strength, but varies in composition and quality depending on the prac-