

# Widening pregnancy care in diabetes



Jill Hill

It is always moving to listen to the stories of women who have lived with type 1 diabetes for a long time, to hear about: when they were young; their struggle to conceive; the frequent heartache of multiple miscarriages; the tragic delivery of a still-born baby; or the loss of a much wanted neonate. Many women recall being advised not to have children because of their diabetes, and if they did, spending long periods of time in hospital during their pregnancy. The expectation that most women with diabetes can experience a relatively normal pregnancy and deliver a healthy baby is one of the more obvious examples of how diabetes care has improved over the last 50 years. Much of this improvement has come from more refined blood glucose monitoring and insulin therapy technologies, encouragement to take folic acid supplements, and more systematic intensive management in diabetes antenatal clinics in secondary care (Diabetes Control and Complications Trial Research Group, 1996; Mills et al, 1988).

This editorial discusses the level of care, of women with diabetes, that has led to these improved outcomes. There is, however, no place for complacency – evidence from a recently published Confidential Enquiry into Maternal and Child Health (CEMACH; 2005) report demonstrates that there is still much room for improvement. The involvement of primary care in preparing women for pregnancy is essential, and a partnership between primary and secondary care can provide a seamless service in optimising the care of women with diabetes who wish to become pregnant and during pregnancy, as described in standard 9 of the National Service Framework (NSF) for diabetes (Department of Health [DoH], 2001).

Having pre-existing diabetes increases risks for the mother and her unborn child (Hawthorne et al, 1997). Developing foetuses of mothers with diabetes have double the congenital anomaly rate of the foetuses of mothers without diabetes. Neural tube defects such as spina bifida, anencephaly and sacral agenesis are examples, as are great vessel abnormalities. Maternal

hyperglycaemia, particularly in the first 8 weeks of gestation, is influential in increasing the risk of such abnormalities. Respiratory distress syndrome is 6 times more common, and maternal hyperglycaemia in the second and third trimester is associated with macrosomia (Hawthorne et al, 1997).

The risk of stillbirth is 4.8 times higher, perinatal mortality is 3.8 times higher and neonatal death is 2.6 times higher in diabetic pregnancies (CEMACH, 2005). Newborn babies of mothers with diabetes are more prone to cardiomyopathy, jaundice, hypoglycaemia and hypocalcaemia (Williams and Pickup, 2004).

Mothers with diabetes have an increased risk of pre-eclampsia, polyhydramnios, urinary tract infections, thrush, carpal tunnel syndrome and reflux oesophagitis (Williams and Pickup, 2004).

As it is such a challenge, management of the diabetic pregnancy should be a partnership between the obstetric and diabetes secondary care team, ideally in a shared diabetes antenatal clinic. The development of the diabetes specialist midwife role is particularly effective in providing seamless care between the two disciplines, with the midwife providing usual antenatal education and care, but also introducing home blood glucose monitoring and insulin therapy to women with type 2 or gestational diabetes, and supporting appropriate insulin dose adjustment in women with type 1 diabetes.

## Case study of a diabetes specialist midwife role

Examples of activity of the diabetes specialist midwife working at Heartlands Hospital (0.8 whole-time equivalent) for 2005 are shown in *Table 1*. Antenatal care is divided into the three trimesters. The first (weeks 0–12) focuses on the achievement of fasting blood glucose levels of <5 mmol/l and postprandial glucose levels of <7 mmol/l and may require switching to a basal-bolus insulin regimen if the expectant mother is using a twice-daily insulin, or may even require insulin pump therapy if tight glycaemic control cannot be achieved without the occurrence of

Jill Hill is a Diabetes Nurse Consultant, Eastern Birmingham Primary Care Trust.

disabling hypoglycaemia. A change to insulin therapy from oral hypoglycaemic agents, which can be teratogenic (Williams and Pickup, 2004), is required for women with type 2 diabetes at this hospital. Screening for diabetes complications at the beginning of a pregnancy is important as existing nephropathy and retinopathy can worsen.

At Heartlands Hospital the addition of folic acid at the higher dose of 5 mg daily is advised if it is not already being taken because of the associated increased risk of neural tube defects in its absence or insufficiency. In order to identify non-viable pregnancies and any other problems (as well as gestational age), an ultrasound scan is done early on during the pregnancy.

Insulin requirements increase during the second and third trimesters due to the insulin resistance effect of progesterone and pregnancy hormones. Fructosamine measurements to assess overall glycaemic control for the previous 2–3 weeks may be more useful than HbA<sub>1c</sub>. Another ultrasound scan between weeks 18 and 22 will identify major malformations, and another at week 26 determines foetal growth rate and amniotic fluid volume (to exclude polyhydramnios).

Frequently, increased titration of insulin doses will be required in the third trimester (weeks 28–40), levelling out at about weeks 34–36, the required dose sometimes declines slightly from then on. Frequent ultrasound scans are used to identify accelerated growth associated with maternal hyperglycaemia and macrosomia.

Ideally, women with diabetes should plan for a normal spontaneous or induced vaginal delivery at weeks 38–39 but an elective Caesarean section will be recommended if potential mechanical problems have been identified. The CEMACH data demonstrate that only 18% of expectant mothers with diabetes had a normal spontaneous delivery compared with 69% of mothers without diabetes (CEMACH, 2005). Glycaemic control during labour is managed with a continuous glucose and insulin infusion. Resumption of pre-pregnancy insulin doses is usually immediately post-delivery as the delivery of the placenta, with the accompanying drop in insulin-resistance-inducing pregnancy hormones, dramatically reduces insulin requirements (Williams and Pickup, 2004). Breast-feeding is encouraged

**Table 1. Diabetes specialist midwife activity for Heartlands Hospital in 2005 (0.8 whole-time equivalent).**

Activity	Number of patient contacts
Patients with gestational or type 2 diabetes started on insulin	203
Inpatient contacts on antenatal or postnatal wards	261
Patient contacts in combined diabetes obstetric clinic	608
Telephone contacts with patients	2243
Antenatal and 6-week postnatal glucose tolerance test for patients with gestational diabetes	176

but only 53% of mothers with diabetes do this compared with 69% of mothers without diabetes (CEMACH, 2005).

The systematic intensive management of pregnancy by shared obstetric and diabetes secondary care teams, at Heartlands Hospital, has improved the outcomes for women with pre-existing type 1 diabetes. However, many women with diabetes do not access this service until after the crucial first 8 weeks of the gestation period when much of organogenesis, and hence potential foetal malformations, occurs.

### Management of pregnancy in primary care

The incidence of type 2 diabetes is increasing and also occurring in younger women still of child-bearing age, particularly Asian and Afro-Caribbean women (DoH, 2001). Many of these women are managed in primary care as they do not have type 1 diabetes. However, the pregnancy outcomes of women with type 2 diabetes, although slightly better than those of women with type 1 diabetes, are significantly worse than in women without diabetes (Dunne et al, 2003). Women with a previous history of gestational diabetes are returned to primary care, and have a high risk of developing gestational diabetes again in future pregnancies. The identification and education of women with type 2 diabetes or impaired glucose tolerance who are planning a pregnancy is, therefore, increasingly falling to primary care. Engaging practice nurses and general practitioners in delivering this role can be a challenge. The following article by Jackie Webb describes the work done in Eastern Birmingham Primary Care Trust (PCT) and Solihull PCT towards improving diabetic pregnancy outcomes by widening pregnancy care beyond the traditional secondary care model. ■

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