

# Pregnancy and diabetes: How primary care teams can help achieve better outcomes

Anne Dornhorst

Nearly 20 years ago, the St Vincent Declaration set the ambitious target of ensuring that, within 5 years, women with diabetes would have the same chances of achieving a successful pregnancy as those without the condition (Diabetes Care and Research in Europe, 1990). Unfortunately, we are still some way from achieving that goal. This article looks at the recently published National Collaborating Centre for Women's and Children's Health guidance on best practice care for pregnant women with diabetes.

Around 650 000 women give birth in England and Wales each year, and 2–5% of these pregnancies involve women with diabetes (National Collaborating Centre for Women's and Children's Health [NCCWCH], 2008). About 87.5% of pregnancies complicated by diabetes are associated with gestational diabetes (which may resolve after pregnancy, or may develop into type 2 diabetes), 7.5% with type 1 diabetes, and the remaining 5.0% with type 2 diabetes (NCCWCH, 2008).

Indeed, diabetes in pregnancy is associated with a number of risks to the mother and to the developing foetus. Research presented at Diabetes UK's 2008 Annual Professional Conference showed that women with diabetes were seven times more likely to deliver a stillborn baby than other women, while caesarean sections and congenital malformations were more than double the norm (Tarigopula et al, 2008). Miscarriage, pre-eclampsia and preterm labour are more common among women with pre-existing diabetes, and diabetic retinopathy can worsen rapidly during pregnancy (NCCWCH, 2008).

Stillbirth, congenital malformations, macrosomia, birth injury, perinatal mortality and postnatal adaptation problems, such as hypoglycaemia, are more common in babies born to women with pre-existing diabetes (NCCWCH, 2008). Estimates from the Confidential Enquiry into Maternal and Child Health (CEMACH, 2005) suggest that the risk of perinatal mortality in babies born to women with diabetes is three to five times that of the national average.

It is clear from such research that, despite the best intentions of The St Vincent Declaration, the risks factors for women with diabetes, their pregnancies and their newborn babies, remain high. Nevertheless, there is encouraging evidence to suggest that effective monitoring and glycaemic control can reduce, if not eliminate, the risks associated with diabetes during pregnancy. Indeed, the CEMACH (2005) found that 59% of pregnant women with diabetes went on to deliver babies and, after 28 days, 86% of those babies were alive and in good health.

Primary care teams are in a key position to help achieve better pregnancy outcomes for women

## Article points

1. Pregnancies complicated by diabetes are associated with a higher risk of a range of complications for both mother and baby.
2. The National Collaborating Centre for Women's and Children's Health has recently published guidance on best practice care for pregnant women with diabetes.
3. Primary care teams are in a key position to help achieve better pregnancy outcomes for women with diabetes, ensuring that they receive the optimum care for their diabetes, their pregnancy and their newborn babies.

## Key words

- Gestational diabetes
- Pregnancy complications
- Maternal and child health

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**Page points**

1. Primary care teams often have unique access to young women with diabetes in the months and years before they become pregnant. This time can be put to good effect to ensure that pregnancies are properly planned and prepared for.
2. A woman with diabetes planning a pregnancy should be informed of the importance of establishing good glycaemic control both before conception and throughout the pregnancy.
3. Women with an HbA<sub>1c</sub> level >10% should be strongly advised to avoid pregnancy and it should be recommended that women with diabetes continue to use contraception until an acceptable HbA<sub>1c</sub> level has been achieved.

with diabetes, and their babies. The NCCWCH (2008), commissioned by NICE, has published guidance on best practice care for pregnant women with diabetes. The guidance spans from preconception planning, through to the postnatal period. This document, revised and published on NICE's web site in July 2008, identified a number of key priorities for implementation.

**Preconception care**

Primary care teams often have unique access to young women in the months and years before they become pregnant. For women with diabetes in particular, this time can be put to good effect to ensure that pregnancies are properly planned and prepared for.

**Planning**

Unplanned pregnancy, particularly in women whose diabetes is not under optimal control, is especially likely to pose risks to both mother and child. It is, therefore, of great importance that all women with diabetes who are of child-bearing age receive good contraceptive advice and are aware of the increased risks surrounding pregnancy when complicated by diabetes. These women should be informed that preconception care is available for when they begin to plan a pregnancy. Preconception care should be provided in a supportive environment, preferably with the woman's partner and/or family in attendance (NCCWCH, 2008).

**Lifestyle measures**

Preconception care for women with diabetes should include a full review of the woman's diet and exercise regimens (NCCWCH, 2008). Women with a body mass index greater than 27kg/m<sup>2</sup> should be offered advice on how to lose weight prior to conception. In addition to being an independent risk factor for a number of adverse pregnancy outcomes, obesity in association with diabetes increases the risk of caesarean section and preterm birth (Solomon et al, 1997; Ray et al, 2001).

**Good glycaemic control**

A woman with diabetes planning a pregnancy should be informed of the importance of

establishing good glycaemic control, both before conception and throughout the pregnancy (NCCWCH, 2008). These women should be offered monthly HbA<sub>1c</sub> level measurements, and advised to self-monitor their blood glucose levels in addition. Optimising glycaemic control before conception, and in the first few weeks of pregnancy, is of prime importance; poor glycaemic control during these times is associated with congenital malformations and miscarriage (Kitzmilller et al, 1991).

The new NCCWCH guidance (2008) recommends that a preconception HbA<sub>1c</sub> target of <6.1% be aimed for, but individualised targets for self-monitoring of blood glucose should be agreed upon, taking into account the risk of hypoglycaemia. Women with an HbA<sub>1c</sub> level >10% should be strongly advised to avoid pregnancy. Indeed, it should be recommended that women with diabetes continue to use contraception until an acceptable HbA<sub>1c</sub> level has been achieved (NCCWCH, 2008).

**Medication regimens**

Preconception care is likely to involve changes to the woman with diabetes' drug regimen. A full review of the woman's medications, for both diabetes and its complications, should be undertaken.

In type 2 diabetes, the use of metformin may continue as an adjunct or alternative to insulin in the preconception period and during pregnancy (NCCWCH, 2008). However, all other oral hypoglycaemic agents should be discontinued prior to pregnancy and insulin substituted (Gutzin et al, 2003; Gilbert et al, 2006).

Experience with short-acting insulin analogues continues to grow, and these agents are considered to be safe for use during pregnancy (Plank et al, 2005). They have advantages over soluble human insulin, including reduced risk of postprandial hyperglycaemia and of hypoglycaemia, both of which are of concern during pregnancy (Mathiesen et al, 2007). There is currently insufficient evidence for the use of long-acting insulin analogues during pregnancy (NCCWCH, 2008).

### Diabetic complications

Women with type 1 diabetes who are planning to become pregnant should be offered ketone testing strips and advised to test for ketonuria or ketonaemia if they are hyperglycaemic or unwell (NCCWCH, 2008).

For women with diabetes receiving anti-hypertensive therapy and planning to become pregnant, the NCCWCH (2008) recommends discontinuing treatment with angiotensin-converting enzyme inhibitors and angiotensin receptor blockers, and finding alternative treatments. Further, statins should be discontinued before pregnancy, or as soon as it is confirmed. Congenital malformations have been reported with use of both angiotensin receptor blockers (Joint Formulary Committee, 2007) and the statins (Cooper et al, 2006).

Additional issues to discuss with women who have diabetes and are planning to become pregnant are summarised in *Box 1*.

### Care during pregnancy

Once a woman with diabetes has become pregnant, she should be referred to a joint diabetes and antenatal clinic. She should maintain contact with her diabetes care team every 1–2 weeks throughout her pregnancy (NCCWCH, 2008).

### Good glycaemic control

The NCCWCH guidance (2008) notes that monitoring of blood glucose levels in pregnant women with diabetes is complicated by the physiological changes that occur in all pregnancies and lead to reduced HbA<sub>1c</sub> levels. This means that an apparent reduction in HbA<sub>1c</sub> in women with diabetes during the second and third trimesters of pregnancy does not necessarily mean that glycaemic control is improving. Therefore, HbA<sub>1c</sub> is considered an unreliable indicator of glycaemic control during pregnancy. Rather, pregnant women with diabetes should aim to maintain a fasting blood glucose level between 3.5 and 5.9mmol/L, and 1 hour postprandial blood glucose levels <7.8 mmol/L. If daily insulin injections are failing to achieve adequate glycaemic control during pregnancy, continuous subcutaneous insulin infusion – insulin pump therapy –

should be considered (NCCWCH, 2008).

There is an increased risk of hypoglycaemia during pregnancies complicated by diabetes, as well as reduced hypoglycaemic awareness, particularly during the first trimester (Diamond et al, 1992; Rosenn et al, 1995). As such, women on insulin therapy and their partner or family should be advised about the prevention, recognition and treatment of hypoglycaemic events, including the provision of glucagon and GlucoGel (BBI Healthcare, Gorseinon).

### Diabetic complications

Pregnancy can increase the risk of diabetic complications, including diabetic ketoacidosis, retinopathy and nephropathy (NCCWCH, 2008).

During pregnancy, women with type 1 diabetes suspected of having diabetic ketoacidosis should be immediately admitted to a high-dependency unit where they can receive both medical and obstetric care.

Screening for retinopathy should be offered at the woman's first antenatal clinic visit and again at 28 weeks' gestation if the first assessment is normal. If any diabetic retinopathy is discovered at the first visit, an additional screening should be performed at 16–20 weeks' gestation. Additionally, if one has not been undertaken in the preceding 12 months, a renal assessment should be arranged for women with diabetes as

### Page points

1. Monitoring of blood glucose levels in pregnant women with diabetes is complicated by the physiological changes that occur in all pregnancies and lead to reduced HbA<sub>1c</sub> levels, meaning that HbA<sub>1c</sub> is an unreliable indicator of glycaemic control during pregnancy.
2. If daily insulin injections are failing to achieve adequate glycaemic control during pregnancy, continuous subcutaneous insulin infusion should be considered.

#### Box 1. Additional advice to offer women with diabetes who are planning to become pregnant (NCCWCH, 2008).

- How pregnancy sickness can affect glycaemic control.
- The increased risk of having a baby that is large for gestational age, which increases the likelihood of birth trauma, induction of labour and caesarean section.
- The need for retinal assessment before and during pregnancy.
- The need for renal assessment before pregnancy for women with diabetic nephropathy.
- The importance of glycaemic control during labour and birth and early feeding to reduce the risk of neonatal hypoglycaemia.
- The possibility of transient morbidity in the baby during the neonatal period, which may require admission to a neonatal intensive care unit.
- The increased risk of the baby developing obesity and/or diabetes in later life.

**Page points**

1. Pregnancy can increase the risk of diabetic complications, including diabetic ketoacidosis, retinopathy and nephropathy.
2. Monitoring of the foetus during a pregnancy complicated by diabetes is of increased importance.
3. Babies born to women with diabetes should not be transferred to community care until they are at least 24-hours old, their blood glucose level is stable, and they have developed good feeding skills.

soon as pregnancy is confirmed (NCCWCH, 2008).

**Foetal monitoring**

Monitoring of the foetus during a pregnancy complicated by diabetes is of increased importance. Ultrasound monitoring of foetal growth and amniotic fluid volume should be undertaken every 4 weeks from 28 to 36 weeks' gestation (NCCWCH, 2008). Due to the increased risk of congenital malformation, all pregnant women with diabetes should be offered antenatal examination of the four-chamber view of the foetal heart and outflow tracts at 18–20 weeks' gestation (NCCWCH, 2008).

**Postnatal care**

Babies born to women with diabetes should not be transferred to community care until they are at least 24-hours old, and not before the hospital team is satisfied that their blood glucose level is stable, and that they have developed good feeding skills (NCCWCH, 2008). Once mother and baby have returned home, the primary care team will play an important role in monitoring their health.

**Gestational diabetes**

Following the birth of their child, women diagnosed with gestational diabetes during their pregnancy should be offered lifestyle advice, including weight control, diet and exercise. At the 6-week postnatal check-up, and annually thereafter, a fasting plasma glucose test (a full 2-hour oral glucose tolerance test is often not realistic for mothers with young children) for these women should be taken to monitor for development of type 2 diabetes (NCCWCH, 2008). It is accepted that gestational diabetes is a risk factor for the development of type 2 diabetes. Recent research suggests that 20% of women develop type 2 diabetes 9 years after diagnosis with gestational diabetes (Feig et al, 2008).

**Breastfeeding**

Breastfeeding may affect glycaemic control and increase the risk of hypoglycaemia (Davies et al, 1989). As such, breastfeeding women being treated with insulin therapy should reduce their insulin immediately after birth and monitor

their blood glucose levels carefully to establish an appropriate dose (NCCWCH, 2008). To manage the risk of hypoglycaemia, women should be advised to have a meal or snack available before or during feeds (NCCWCH, 2008).

Women with diabetes who are breastfeeding should continue to avoid any drugs for the treatment of diabetes and its complications that were discontinued for safety reasons during the preconception period (NCCWCH, 2008).

**Conclusion**

While we have not yet reached the ideal envisaged by the signatories of The St Vincent Declaration, there is much to be hopeful about in the management of pregnancy in women with diabetes. Indeed, advances in community care for both pregnancy and diabetes, places the primary care team in an important position: to ensure that women with diabetes receive optimum care for their diabetes, their pregnancy and their newborn babies. ■

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