

# Preconceptual care for women with diabetes

Fiona Kirkland

## Introduction

**Preconceptual care encompasses the educational care and promotion of understanding of the measures necessary to reduce the risk factors in women with type 1 or type 2 diabetes who wish to become pregnant. The aim is a healthy pregnancy and a normal, healthy baby and mother at delivery. A literature search was carried out to gain further understanding of the importance of preconceptual care and to assess the mechanics of different teams and the forms in which such care had been delivered to date. Using the information gathered, we hoped to develop and improve our service.**

**B**efore the discovery of insulin, few women with diabetes became pregnant. Among those who did, the maternal mortality rate was 50% with minimal chance of a live fetus (Parker, 1996).

By the late 1930s the perinatal mortality rate had decreased to 40%. Perinatal mortality was thought to be due to diabetic ketoacidosis, late intrauterine death and prematurity (Gregory and Tattersall, 1992). Even in 1970, the textbooks were painting a bleak outlook for diabetic women hoping to become pregnant. The fetal mortality rate was 20% (Parker, 1996).

As the number of live babies born increased, a relative increase in the incidence of congenital abnormalities was seen (Tattersall and Gale, 1990). Major congenital abnormalities remain the leading cause of death and morbidity in babies of diabetic mothers (Kitzmilller et al, 1996).

The incidence of fetal abnormalities in the babies of diabetic mothers has now decreased to about 5% (Kellener, 1994), compared with 2% in the general population. This is possibly due to improvements in health care, knowledge and fetal monitoring.

### Fetal abnormalities

Maternal hyperglycaemia early in pregnancy can have a teratogenic effect. Organogenesis is complete around the ninth week of gestation. If hyperglycaemia has been present in the early weeks of pregnancy, abnormalities

may have developed before the woman knows that she is pregnant, emphasising the importance of preconceptual care.

### Early abnormalities

Anomalies of the heart and renal system, and skeletal and open neural tube defects, may be evident. Sacral agenesis is a neural tube defect that is specific to maternal hyperglycaemia, and anencephaly is more likely in such a pregnancy. The presence of one abnormality increases the likelihood of others being present (Tindle and Sterling, 1997).

### Later abnormalities

Macrosomia may develop if hyperglycaemia is present later in pregnancy and there is no microvascular disease. If microvascular disease is present and glycaemic control is poor, the function of the placenta will also be affected, leading to a smaller than expected baby for such a pregnancy.

### The neonatal period

Babies born to women with diabetes may have breathing or feeding difficulties due to relative immaturity, may be more prone to jaundice, and may initially become hypoglycaemic if maternal blood sugars were high during labour (Sweet, 1984).

### Maternal complications

Early in pregnancy, women with diabetes have an increased rate of abortion (Lorber,

## ARTICLE POINTS

**1** Preconceptual care is of paramount importance in women with diabetes.

**2** The aim is the delivery of an infant who is anatomically and physiologically normal, avoiding maternal complications of poorly controlled diabetes.

**3** Every member of the healthcare team should look for and attempt to correct negative health practices.

**4** Even with good glycaemic control, the risk of a woman with diabetes delivering a baby with abnormalities cannot be ruled out.

**5** There is a need to educate all women with diabetes of childbearing age.

**6** Optimum glycaemic control is achievable through team effort.

## KEY WORDS

- Diabetes
- Preconceptual care
- Glycaemic control
- Fetal abnormalities

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**PAGE POINTS**

**1** In most centres, women with diabetes have a higher rate of both elective and emergency caesarean section.

**2** Good glycaemic control before conception reduces the incidence of congenital abnormalities.

**3** Any woman with diabetes wishing to become pregnant should be aware of the need to access further support.

**4** Preconceptual care should be given to adolescents and to other females soon after diagnosis.

1995). There is also an increased likelihood of polyhydramnios and pre-eclampsia (Sweet, 1984). Later in pregnancy and at delivery the risk of intervention is increased. In most centres, the rate of both elective and emergency caesarean section is increased in women with diabetes.

The good news is that the American Association of Diabetes Educators (AADE) Task Force on Diabetes and Pregnancy (1993) found that good glycaemic control before conception reduces the incidence of congenital abnormalities. This was expanded by the American Diabetes Association (ADA, 1996) which states that:

**'To prevent early pregnancy loss and very costly congenital malformations in infants of diabetic mothers, optimum medical care, patient education and training must be given before conception.'**

**Aim of preconceptual care**

The aim of preconceptual care must be to achieve a pregnancy outcome that approximates to that of the non-diabetic woman (Parker, 1996), i.e. a healthy pregnancy, and a normal healthy baby and mother at delivery.

**Who should receive preconceptual care?**

Ideally, any woman with diabetes who wishes to become pregnant should be aware of the need to access further support. If she is not intending to become pregnant,

she should understand the importance of contraception.

When discussing the age at which to begin such care, we must remember that we live in a rapidly changing world with differing pressures, and that sexual activity for today's teenagers has become commonplace.

The ADDE (1992) and Lorber (1995), both agree that there is a need to educate all women of childbearing age with diabetes of the importance of good blood sugar control preconceptually and of the risks of an unplanned pregnancy. The Specialist Workgroup Report *St Vincent and Improving Diabetes Care* (Brown et al, 1996) suggests that preconceptual care should be given to adolescents, and to other females soon after diagnosis.

Women with type 2 diabetes should also receive such care, remembering that women of ethnic minorities may be diagnosed at an earlier age and that some women may wish to delay having a family until their careers are established.

**The multidisciplinary team**

The aim of the multidisciplinary team is to educate women with diabetes so that they have sufficient knowledge to avoid an unplanned pregnancy and, when contemplating pregnancy, to achieve good glycaemic control and optimum health before conception. The Diabetes Control and Complications Trial (DCCT, 1993) clearly demonstrated that good glycaemic control could be achieved through team effort.

*Figure 1* shows the different members of the healthcare team who may be involved in the preconceptual care of women with diabetes. Their involvement is necessary in order to provide the woman with a full assessment and educational plan to ensure understanding of the task ahead including the management of antenatal care and implications in labour.

**The patient:** The patient is the central, active part of the team.

**The partner:** The partner should be encouraged to attend appointments wherever possible, so that information can be shared and support offered both emotionally and practically.

**The diabetologist:** The diabetologist will

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*The patient forms the central part of the team.*

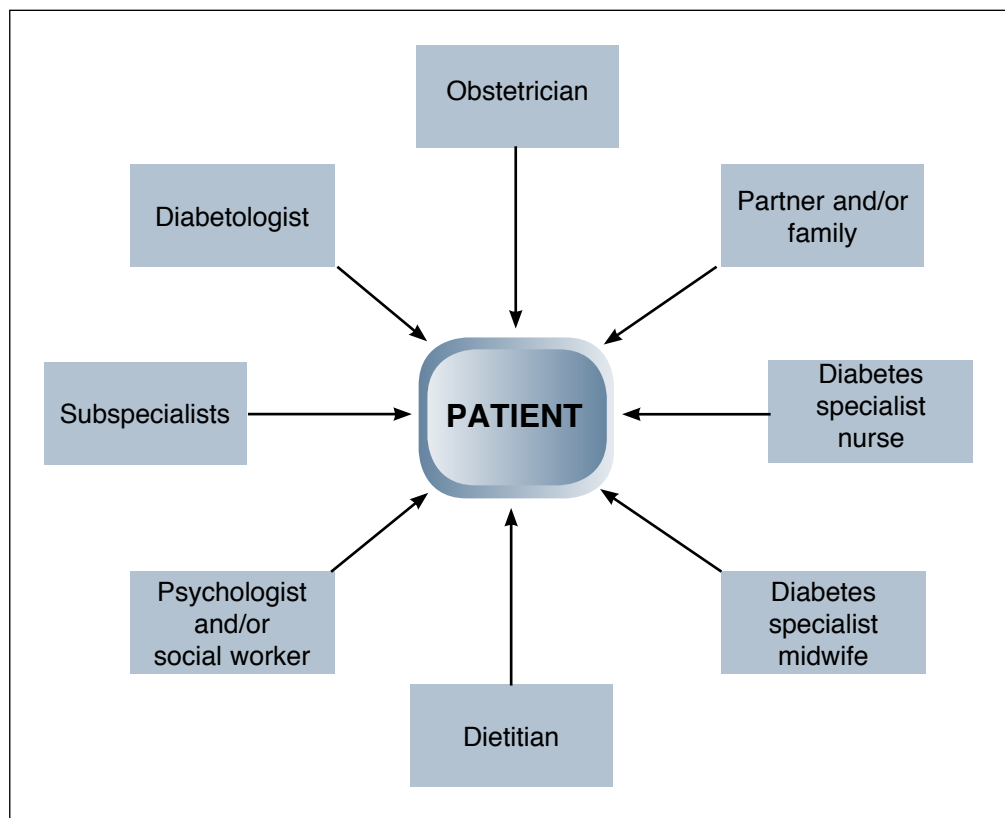


Figure 1. The multidisciplinary team approach to preconceptual care. The key to success is the close interaction between the patient and the team.

PAGE POINTS

1 Any possibility of infertility needs to be recognised immediately because of the greater risks from diabetic complications with increasing age.

2 The DSN has an extensive role to play in the provision of preconceptual care.

3 Adequate time should be allocated so that counselling skills can be utilised in every consultation.

4 The DSN also needs to assess the woman's current knowledge and self-management of hypoglycaemia and ketoacidosis.

assess medical history and the presence of any diabetic complications, as in the annual review. Any complications present must be stabilised before conception. Only if complications are extensive or uncontrollable would pregnancy be advised against.

Medication will be assessed, particularly blood pressure medication, oral medication for type 2 diabetes will be stopped and insulin therapy will be commenced. Folic acid supplements are commenced generally 400 µg and continued until the 12th week of pregnancy in order to reduce the risks of open neural tube defect (Tindle and Sterling, 1997).

**The obstetrician:** The obstetrician will assess obstetric health and history. A Papanicolaou (Pap) smear may be taken and immunity status to rubella will be assessed. Contraception will be discussed so that conception does not occur before optimum glycaemic control is achieved for that individual.

The patient's individual risk of problems in pregnancy and labour, or of fetal abnormalities due to other conditions, are also assessed. Any possibility of infertility

needs to be recognised immediately because of the greater risk from advancement of diabetic complications with increasing age.

**The diabetes specialist nurse:** The DSN has an extensive role to play, employing differing skills with individual patients. Most importantly, adequate time should be allocated so that counselling skills can be utilised in every consultation. Other skills include the provision of information and assessment of patient understanding with regard to reducing the health risks, and assessment of the patient's knowledge and self-management of hypoglycaemia and ketoacidosis so far.

Areas to consider include:

- How does the woman monitor her diabetes?
- In what areas does she feel she can improve her diabetes control?
- What changes does she feel may occur in pregnancy?
- What impact on her life will tight glycaemic control have while she is pregnant?

These and many more questions will be addressed before pregnancy to give the woman an idea of the changes that may

**PAGE POINTS**

1 Improved glycaemic control increases the risk of hypoglycaemia.

2 Unlike hyperglycaemia, hypoglycaemia does not cause fetal abnormalities.

3 Hypoglycaemic warnings may also be reduced with tighter glycaemic control.

be needed, both in diabetes management and in lifestyle, in order to reduce the risk factors, and to provide information on what to expect in pregnancy.

**The diabetes specialist midwife:** This team member is available in some units and provides further support by offering information on clinic routines, frequency of visits, and investigations that will be necessary antenatally. Until good glycaemic control is achieved, advice regarding an effective mode of contraception and patient attitudes will be discussed.

**The dietitian:** The dietitian completes a dietary assessment, offering individual advice with regard to safety and weight management to achieve optimum health preconceptually. Management of blood sugar levels and how to overcome hypo-

glycaemia if nausea and vomiting occur in early pregnancy will also be discussed. Iron supplements may be advised.

**The clinical psychologist:** The clinical psychologist can help the patient who needs to develop self-understanding and coping skills at this time of emotional pressure and stresses at work and at home. Attitudes to diabetes can be explored. If diabetes is not seen as a priority, awareness of the importance of good glycaemic control can be adversely affected.

**Subspecialists:** Women with diabetes may be referred to a relevant subspecialist, such as a cardiologist, ophthalmologist and nephrologist, for assessment and stabilisation of a specific condition.

All members of the healthcare team should look out for and attempt to correct negative health practices such as smoking, substance abuse, obesity, partner's attitudes and ethnic/cultural considerations. Together, the healthcare team can make a full preconceptual care assessment to ensure that the woman receives positive individualised advice and support (Figure 2).

**Hypoglycaemia**

With improved glycaemic control, the risk of hypoglycaemia increases. Hypoglycaemic episodes are also more likely to be severe, i.e. require assistance. To a degree this is acceptable because, unlike hyperglycaemia, hypoglycaemia does not cause fetal abnormalities. However, consideration needs to be given to the safety aspects in activities such as driving.

Hypoglycaemic warnings may also be reduced with tighter control. Increased monitoring will therefore be necessary in order to assess overall effectiveness of the insulin regimen, and enable the necessary adjustments to be made. Self-management is encouraged with knowledge and support.

So far, in the areas of greatest need, enrolment into preconceptual care clinics has been less than 50%. The drop-out rate is also high (52%), this is thought to be due to an inability to conceive as quickly as expected and also due to a dislike of the strict regime (Gregory and Tattersall, 1992). These authors found that patients who did book preconceptually were likely to be the more motivated, already having



Figure 2. Assessment tree, showing assessments needed at registration for preconceptual care.

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good glycaemic control and good health practices, and so are already at lower risk of having a baby with congenital abnormalities. The problem that remains, therefore, is how to attract the less motivated patients with poor health practices.

It is important to remember that intensive control of blood sugar antenatally cannot reduce the number of spontaneous abortions nor the incidence of fetal abnormalities, as organogenesis has already occurred by the time glycaemic control improves.

### Where to now?

The author plans to audit the preconceptual care given in her own centre. The first step will be for the diabetes team to agree standards of preconceptual care. This will then be circulated to all team members and a meeting will be arranged for discussion and agreement. The agreed standards will then be used to audit the care given, and the results used to develop and improve the service provided.

### Conclusions

Advances in knowledge and health care have made successful pregnancies very achievable for the vast majority of women with diabetes. The literature suggests that a team of experts needs to be involved in the delivery of preconceptual care for up to 3 months prior to conception. Good control should then be maintained for at least 9 weeks antenatally (for organogenesis to occur), and beyond.

However good a woman's glycaemic control is before pregnancy, the risk of her having a baby with congenital abnormalities

cannot be ruled out. Conversely, even with very poor control in the first trimester, a woman with diabetes has only a 10–20% risk of having a baby with congenital abnormalities (Tattersall and Gale, 1990).

The problem that remains is how to attract the less motivated women with poor health practices. Their needs may be the greatest of all, and they may be less able to cope with the consequences. ■

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### PAGE POINTS

**1** The vast majority of women with diabetes can now achieve successful pregnancies, owing to advances in knowledge and health care.

**2** Even with very poor glycaemic control in the first trimester, a woman with diabetes has only a 10–20% risk of having a baby with congenital abnormalities.

**3** So far, in the areas of greatest need, enrolment into preconceptual care clinics has been less than 50%.

**4** The problem is how to attract the less motivated women with poor health practices.