



InDependent Diabetes Trust

Gestational Diabetes

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Gestational diabetes is the type of diabetes that occurs during pregnancy but disappears after the baby is born. Like other forms of diabetes, gestational diabetes affects the way the body uses the glucose [sugar] in the blood and as a result the blood sugars rise too high. The glucose in the blood is the body's main source of energy.

If gestational diabetes is untreated or uncontrolled, it can result in a variety of health problems for both mother and baby. So it is important that a treatment plan is worked out to keep blood sugars within the normal range. The good news is that controlling blood sugars can help to ensure a healthy pregnancy and a healthy baby.

Signs and symptoms

Most women do not have any signs or symptoms of gestational diabetes but your healthcare professional will check for gestational diabetes as part of your pre-natal care.

When signs and symptoms do occur they include:

- Excessive thirst
- Increased urination.

About 3 to 5% of all pregnant women develop gestational diabetes.

The causes of gestational diabetes

Normal metabolism

Normally during digestion the body breaks down the carbohydrates you eat into simple sugars [glucose] and this glucose is absorbed into the blood and transported around the body by the blood vessel system to provide the energy needed for all our activities. However, this process cannot take place without insulin.

Insulin is produced in the pancreas, a gland behind the stomach, and it helps the glucose to pass into the cells to provide energy and at the same time, maintain normal levels of glucose in the blood.

The liver also plays a part in maintaining normal blood glucose levels. When there is more glucose in the cells than your body needs for energy, your body removes it from the blood and stores it in the liver as glycogen. It can then be used when necessary, such as at times when you run low on glucose eg if you have missed a meal. In this situation the liver releases glucose into the bloodstream.

The amount of glucose in the blood varies according to several factors

– the food eaten, exercise, stress and infections. The relationship between insulin, glucose and the liver makes sure that the blood glucose levels stay within normal limits. This should be 4 to 7mmols/l.

During pregnancy, the placenta, which supplies your baby with nutrients, produces hormones that prevent the insulin from working properly. These hormones include oestrogen, cortisol and human placental lactogen. They are vital for a healthy pregnancy but they also make the cells in your body more resistant to insulin.

As the placenta grows larger in the second and third trimesters, it produces even more of these hormones so further increasing insulin resistance. Normally the pancreas will respond by producing enough extra insulin to overcome this resistance but sometimes three times as much insulin as normal may be necessary and the pancreas can't produce enough. When this happens the glucose in the blood cannot be transported into the cells and too much remains in the blood so raising the blood glucose levels above normal and this is gestational diabetes.

Who is at risk of developing gestational diabetes?

Many women who develop gestational diabetes have no known risk factors and any woman can develop it although some are at greater risk than others. The risks increase with:

Age – women older than 25 are more likely to develop it.

Family history – if a close family member, such as a parent or sibling, has Type 2 diabetes.

Personal history – if you've had gestational diabetes with a previous pregnancy or if you have had an unexplained still birth or a baby weighing more than 9 pounds, you may be screened more closely for gestational diabetes with the future pregnancies.

Weight – being overweight before the pregnancy makes gestational diabetes more likely but gaining weight during the pregnancy does not cause it.

Race – women from certain races are more prone to gestational diabetes eg black women.

Diagnosis and screening

Until recently there was no evidence from research that screening for gestational diabetes resulted in fewer childbirth complications and healthier babies but a study in 2005 showed that screening women and treating gestational diabetes aggressively resulted in fewer complications and healthier babies. So screening is usually a routine part of prenatal care for most mothers. There is some debate amongst doctors about whether women under 25 with no risk factors for gestational diabetes should undergo the test because their risk is low.

Screening usually takes place between 24 and 28 weeks of the pregnancy because the condition can't be detected until then. If your doctor thinks that you are at particular risk, it may be done earlier.

What is the test?

You will be asked to drink a glucose solution that tastes very sweet and then you are asked to wait for an hour after which a blood sample is taken from a vein in your arm. This will measure the level of sugar [glucose] in your blood and will tell how efficiently your body deals with sugar.

A blood sugar level of below 7.5mmols/l is usually considered normal in this test. Having a blood sugar level above this does not necessarily mean that you have gestational diabetes but it does mean that you will need a further test. For the next test you will be asked to fast overnight, then you will be given another sweet drink that has a higher

concentration of glucose. This time your blood sugar levels will be monitored every hour for 3 hours and if at least two of the results are abnormally high, this confirms the diagnosis of gestational diabetes.

During pregnancy routine urine tests are carried out but these are not sufficiently reliable to diagnose gestational diabetes because the amount of sugar in the urine can vary throughout the day as a result of the food eaten.

Treatment

Controlling your blood sugar is essential to having a healthy baby and avoiding complications during the delivery. Most women are able to do this with lifestyle changes – diet and exercise, but some may need medication as well. In both cases measuring blood sugar levels is essential because it tells you whether your blood sugars are within the normal range.

Monitoring your blood sugar levels

This might sound difficult at first but once you have learnt how to do it, it will become routine. You draw a drop of blood from your finger with a special device and place it on a test strip which is then put into a blood glucose monitor that provides a reading of your blood sugar level at that time.

Blood sugar levels fluctuate throughout the day according to what you have eaten and how much exercise you have taken, so your doctor may suggest that you carry out blood sugar tests several times a day to ensure that they stay within healthy limits.

Note: your doctor will measure your blood sugars during labour – if they rise too high, your baby's will also rise and this will cause the baby to produce insulin which may lead to low blood sugars [hypoglycaemia] after the birth.

Diet

A healthy diet is important for all pregnant women but for those with gestational diabetes, diet is part of the treatment – eating the right kind of food in the correct amounts is one of the best ways to control blood sugar levels.

Generally you should eat more fruit, vegetables and whole grains that are high in nutrition but low in fats and calories and fewer animal products and sweets. However, no one diet is suitable for everyone and you should discuss the diet that is suitable for you with a dietitian.

Exercise

Physical exercise generally lowers blood sugar levels for two reasons:

- it causes sugar [glucose] to be transported to the cells where it is needed for energy and so the blood sugar levels drop
- it also reduces blood sugar levels by increasing the body's sensitivity to insulin - so your body needs less insulin to transport glucose to your cells.

Exercise is important for all pregnant women:

- it helps to prevent some of the discomforts during pregnancy – back pain, muscle cramps, constipation and sleep difficulties
- it prepares you for labour by increasing muscle strength and the endurance developed by regular exercise reduces the stress on your ligaments and joints during delivery.

Type of exercise suitable for women with gestational diabetes:

This should be discussed with your doctor or healthcare professional and then you can decide which activities you enjoy. Safe aerobic activities are a good way to lower blood sugars eg walking, cycling and swimming but ordinary activities such as gardening and housework can also have a similar effect. If you haven't been active for some time, then you should build up your exercise levels gradually until you are carrying out moderate aerobic exercise on most days.

Stretching and strength training exercises combined with aerobic exercise at the same time everyday is the best combination. Varying your exercise routine and working out with other pregnant women can help you stay motivated.

Medications

Sometimes exercise and diet are not sufficient to lower your blood sugar so medication may be necessary. Until recently insulin was the only option for women with gestational diabetes because it does not cross over to the baby through the placenta but more recently the oral drug metformin [glyburide] is used in Europe.



Monitoring your baby

Ultrasound

When you have gestational diabetes your baby's growth will be closely monitored by ultrasound. Ultrasound uses high-frequency sound waves and computer processing to give pictures of your baby inside the uterus. Ultrasound is less accurate as your baby gets bigger.

Non-stress test or biophysical profile

If you are taking medications for your gestational diabetes your doctor may suggest a non-stress test [NST] or biophysical profile to make sure that your baby is getting enough oxygen and nourishment, especially nearer to the due date. This is a non-invasive, simple test that takes about 30 minutes and can be done at home. It will not cause your baby any stress and simply checks how often your baby moves and how much the baby's heart rate increases with this movement.

Length of pregnancy

In most cases doctors try to prevent your pregnancy from going longer than 40 weeks because this may increase the risk of complications. Most women with gestational diabetes deliver healthy babies but labour is not routine and delivery by Caesarian section can sometimes

be necessary. Gestational diabetes does not affect your ability to breast feed or look after your new baby.

Complications

If you have gestational diabetes, it is understandable that you may worry about the health of your baby and the possibility that it may cause birth defects. However, this is not usually the case because in general birth defects develop during the first 3 months of pregnancy. Gestational diabetes does not develop until the second or third trimester so blood sugar levels are normal during the early, critical months. So most women go on to deliver healthy babies but untreated or uncontrolled blood sugar levels can cause problems for you and your baby.

Complications that may affect your baby

Consistently keeping your blood sugar levels within the normal range can reduce these possible complications.

- Macrosomia is when the baby grows too large because extra glucose crosses the placenta into the baby's blood. The baby's pancreas then makes extra insulin to cope with this and the baby grows too large [macrosomia]. Very large babies may have difficulty during delivery and are more likely to sustain birth injuries or be born by Caesarian section.
- Hypoglycaemia [low blood sugar levels] occurs in some babies immediately after birth. This is because the babies are accustomed to receiving large amounts of blood sugar from their mothers and their own insulin production is high. Babies with hypoglycaemia have their blood sugar levels checked regularly after birth and are given glucose through an intravenous drip to prevent the blood sugars dropping too low.
- Respiratory distress syndrome is a condition that makes breathing difficult. It is more likely to occur in premature babies. It is caused

by a lack of certain substances in the lungs that help prevent the lungs from collapsing when the baby takes a breath. Some babies may need help with their breathing until their lungs become stronger.

- Jaundice is a yellowish colouring of the skin and the whites of the eyes. It occurs because the baby's liver is not sufficiently mature. New-born jaundice may begin within 2 or 3 days after birth but sometimes it does not appear for a week. New-born jaundice is not a disease in itself and is not serious but will be monitored by the doctor.
- Shoulder dystocia can occur if the baby is very large and the shoulders are too big to move through the birth canal. In most cases doctors can free the baby but injuries may occur. This is a rare but serious complication of gestational diabetes.
- Stillbirth or death is a rare occurrence but if it occurs, it is usually because gestational diabetes is undetected and therefore untreated.

Complications that may affect you

If you have gestational diabetes, then you may be at risk of the following complications:

- Pre-eclampsia is characterised by significant increase in blood pressure and left untreated, it can lead to serious complications for mother and baby. Having gestational diabetes increases the risk of pre-eclampsia.
- Caesarian section may be recommended if your baby is large [macrosomia] but gestational diabetes itself does not mean that a Caesarian section has to be planned.
- Type 2 diabetes is more likely to develop in later life in women that have gestational diabetes although many cases can be prevented with a healthy lifestyle - a healthy diet and regular exercise. Up to 40% of women develop Type 2 diabetes within 5 to 10 years after delivery but the risk may be increased in obese women.

Living with gestational diabetes

It is not easy living with a condition that can affect the health of your unborn baby and you may find it stressful, especially as you have to carry our regular blood sugar monitoring, follow a healthy diet and take regular exercise.

Prolonged stress itself can raise blood sugar levels so it is important to learn as much as you can about your condition – books from the library, talking to other women with the same condition and of course, talking to your doctor, dietitian, midwife and a diabetes specialist nurse. They can answer your questions and help you to learn how to manage your blood sugar levels during pregnancy.



After your baby is born

You can breast feed and look after your baby. After the birth your blood sugar levels will be checked frequently and then again in 6 weeks. Gestational diabetes usually clears up after the baby is born because when the placenta is removed, the hormones it was producing which caused your insulin resistance are also removed.

Once you have had gestational diabetes it is sensible to have your blood glucose levels tested at least once a year and also to maintain a healthy lifestyle to lessen your chances of developing Type 2 diabetes later in life.



Research

The number of women with gestational diabetes has been underestimated

A new study to be published in the March 2010 issue of Diabetes Care, suggests that twice as many women than previously thought develop gestational diabetes - 16% of women develop gestational diabetes compared to previous estimates of 8%.

Gestational diabetes is an impaired glucose tolerance that develops during pregnancy, usually the second and third trimester, and has to be carefully managed and sometimes treated with insulin. If gestational diabetes goes undetected, there is the potential for this group of women to produce large babies which could lead to injury at birth and the need for birth by caesarean section. While this form of diabetes disappears after the birth of the baby, women who have gestational diabetes are more likely to develop Type 2 diabetes later and increased risks of their children developing Type 2 diabetes and obesity in later life.

NICE Draft guidance on gestational diabetes

Women who put on weight during pregnancy could increase their risk of developing gestational diabetes during the second and third trimester by 74%, according to a new US study [Obstetrics and Gynaecology, 2010; 115: 597-604].

The three year study of 1,145 pregnant women found that those who were overweight or obese and from ethnic minority groups have the greatest risk of developing gestational diabetes. Women who gained 0.41-0.97 kg/week had a 74% increased risk of developing gestational diabetes compared with women who gained less than 0.27 kg/week. Women who were already overweight at the start of the pregnancy and gained 0.41 kg/week had a two-fold increased risk.

At the same time that this study was published, NICE issued draft guidance recommending that health professionals ensure that women who are pregnant or planning a pregnancy and mothers who

have had a child in the last 2 years understand the health risks of being overweight during pregnancy and the importance of achieving a healthy weight prior to pregnancy.

The draft recommendations are available on the NICE website at: <http://guidance.nice.org.uk/PHG/Wave18/3>. Final guidance will be published in July 2010.

Physical activity before pregnancy may reduce the risk of gestational diabetes

In this study a questionnaire about physical activity and sedentary behaviour was used and information analysed from 21,765 women who reported at least one pregnancy between 1990 and 1998.

There were 1428 cases of gestational diabetes and after taking into account body mass index, dietary factors etc, results showed that the risk of gestational diabetes was significantly less in women who took vigorous activity before pregnancy. Equally, brisk walking pace was associated with significantly lower risk compared with an easy pace. Women who spent 20 hours per week or more watching television but did not perform vigorous activity had a significantly higher risk of gestational diabetes than women who spent less than 2 hours per week watching television and were physically active.

The scientists concluded that the study provides strong evidence that regular physical activity before pregnancy is associated with lower risk of gestational diabetes.

Diabetes Care May 2006

Gestational diabetes linked to weight gain before pregnancy

Women planning to become pregnant may reduce their risk of developing gestational diabetes by not gaining weight within the 5 years before becoming pregnant. A US study identified 251 women who developed gestational diabetes and 204 who did not, to serve as controls. The women all delivered a live baby between 1996 and 1998.

The association between weight gain and gestational diabetes was greater in women who were not initially overweight or obese. Women who gained from 2.3 to 10 kilograms per year had a 2.5-fold increased risk for gestational diabetes compared with women with stable weights. Gaining 1.1 to 2.2 kilograms a year (2.4 to 4.8 pounds) was associated with a small increased risk, while losing from 1.1 to 12.2 kilograms (up to nearly 27 pounds) per year did not significantly alter the risk. These findings suggest that weight gain within 5 years of pregnancy increases the risk of gestational diabetes.

American Journal of Obstetrics and Gynecology, April 2008

The longer a woman breastfeeds, the less likely her child will become overweight later

Breastfeeding longer than three months can cut by more than 40% a child's risk of becoming overweight or obese by the age of 8 if the child was born to an overweight mother diagnosed with gestational diabetes during her pregnancy.

The study carried out in Germany included 324 children born to women with gestational diabetes during the years 1995-2000. More than 37% of children who were never breastfed had become overweight by the age of 8. Of those who were breastfed for up to three months, 32.5% became overweight children but of those who were breastfed longer than three months, only 22% became overweight.

The study also found, however, that obese women, whose children were therefore at greater risk for obesity, were less motivated to breastfeed than non-obese women and twice as likely to forego breastfeeding their children as women of healthier weights.

The researchers recommend anyone diagnosed with gestational diabetes to breast feed for as many months as possible to reduce the risk of their children gaining excessive weight as they grow up and is a means of getting children started on a path to good health.

Diabetes Care May 2006

Pesticides may increase the risk of gestational diabetes

Research [Diabetes Care, March 2007] has shown that exposure to agricultural pesticides during the first trimester increases the risk of a woman developing gestational diabetes [diabetes during pregnancy]. The study was carried amongst farmers' wives.

Of 11,273 women who became pregnant 506 reported having gestational diabetes within 25 years after entering the study. 57% of the women had mixed or applied pesticides at some time in their life and the proportion was similar in those with and without gestational diabetes. However, women who mixed, applied or repaired pesticide equipment during the first trimester had a more than twofold increased risk of developing gestational diabetes.

By contrast, women with residential exposure to pesticides or indirect exposure during the first trimester had no increased risk and nor did women who had mixed or applied pesticides before the study when they were not pregnant.

This study may have significant public health benefits and farmers' wives may be advised to avoid handling pesticides during pregnancy.

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