Diabetes type 1

Summary

- Diabetes is a condition of the endocrine system (the system of glands that delivers hormones).
- Type 1 diabetes can occur at any age, but tends to develop in childhood.
- Untreated diabetes can severely damage many systems, organs and tissues of the body.
- There is no cure, but the disorder can be successfully managed with medication, dietary modifications and exercise.

Every day, two more Australian children and as many as six Australians of all ages develop type 1 diabetes, which makes it one of the most common serious diseases among children. Diabetes is a condition of the endocrine system (the system of glands that delivers hormones).

To use glucose (blood sugar) for energy, the hormone insulin needs to be secreted by the pancreas, a gland located in the abdomen. A person with type 1 diabetes is unable to produce insulin. Treatment involves closely monitoring blood sugar levels, modifying diet and taking daily injections of insulin.

Type 1 diabetes can affect anyone, but is more common in people under 30 years and tends to begin in childhood. Other names for type 1 diabetes have included juvenile diabetes and insulin-dependent diabetes mellitus (IDDM).

Approximately one in every ten Australians with diabetes has type 1 diabetes. Type 1 diabetes is much more common in Australia than in other countries.

The pancreas and type 1 diabetes

The digestive system breaks down carbohydrates into glucose. This simple sugar is then transported to each cell via the bloodstream. The pancreas secretes the hormone insulin, which allows the glucose to migrate from the blood into the cells. Once inside a cell, the glucose is ‘burned’, along with oxygen, to produce energy. The pancreas of a person with type 1 diabetes doesn’t make enough insulin to keep blood glucose normal.

Without insulin, the glucose remains in the bloodstream at high levels. The body recognises the problem and tries to provide the cells with other sources of fuel, such as stored fats. Extensive fat burning can release by-products called ketones, which are dangerous in high amounts.

Symptoms of type 1 diabetes

The symptoms of type 1 diabetes include:

- excessive thirst
- frequent urination
- weight loss
- fatigue
- visual disturbances, such as blurred vision
- itching skin, particularly around the genitals
- nausea and vomiting.

Cause of type 1 diabetes

The exact cause of type 1 diabetes is unknown and there is no cure. It is thought that some kind of environmental factor, perhaps a viral infection, makes the immune system attack the insulin-producing cells of the pancreas in
people who have a genetic history of diabetes. There is then a long period without symptoms before the insulin-producing cells are destroyed and the blood glucose rises.

Complications of untreated type 1 diabetes
Untreated diabetes can severely damage many systems, organs and tissues of the body. Complications include:

- kidney damage
- increased likelihood of infections such as thrush and also more serious infections
- damage to the eyes (diabetic retinopathy)
- poor blood circulation in the legs and feet, potentially leading to lower limb amputation
- damage to the nerves of the feet
- much higher risk of heart disease and stroke
- sexual impotence.

Diagnosis of type 1 diabetes
The main diagnostic test for diabetes is taking a blood test to measure glucose, either when you have been fasting or at other times of the day. Diagnostic tests are also done routinely during pregnancy to identify diabetes in pregnancy (gestational diabetes).

Types of diabetes tests
Tests to diagnose diabetes include:

- Fasting blood glucose test (most common) – blood glucose levels are checked after fasting for between 12 and 14 hours. You can drink water during this time, but should strictly avoid any other beverage. People with diabetes may be asked to delay their diabetes medication or insulin dose until the test is completed.
- Random blood glucose test – blood glucose levels are checked at various times during the day, and it doesn’t matter when you last ate. Blood glucose levels tend to stay constant in a person who doesn’t have diabetes
- Oral glucose tolerance test – a high-glucose drink is given. Blood samples are checked at regular intervals for two hours.

Immediately after the diabetes test
The fasting blood glucose test will confirm that the person has diabetes if it shows that the level of glucose in their blood is higher than normal when they are fasting.

Sometimes, the test result of the fasting blood glucose test is borderline. If this is the case, a glucose tolerance test may be performed. This test will confirm diabetes if the person’s blood sugar levels stay high for a long time after the tests.

Accuracy of diabetes test results
Depending on the test used, the level of blood glucose can be affected by many factors including:

- eating or drinking
- taking medications that are known to raise blood sugar levels, such as oral contraceptives, some diuretics (water pills) and corticosteroids
- physical illness or surgery that may temporarily alter blood sugar levels.

Treatment of type 1 diabetes
There is no cure for type 1 diabetes, but the condition can be successfully managed. Treatment includes:

- taking insulin daily by injections or by insulin pump
- self-monitoring of blood sugar levels by regularly testing droplets of blood in a glucose meter
- self-testing of urine with a test strip for high levels of ketones – not routinely, but when problems are suspected

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regulating diet so intake is matched to insulin and exercise
increasing the amount of ‘slow’ carbohydrates in the diet, such as beans and fruit, which take longer to be absorbed by the body
regular exercise
maintaining regular checks for diabetes complications.

Hypoglycaemia
If a person with type 1 diabetes skips a meal, exercises heavily or takes too much insulin, their blood sugar levels will fall. This can lead to a ‘hypo’ (hypoglycaemic reaction). The symptoms include dizziness, sweating, hunger, headache and change in mood. This can be remedied with a quick boost of sugar (such as jellybeans or glucose tablets), then something more substantial such as fruit. A person with type 1 diabetes should have lollies on hand at all times, just in case.

Type 1 diabetes and ketoacidosis
Sometimes, the onset of type 1 diabetes can be sudden, and can lead to a condition called ketoacidosis, which is a medical emergency. The symptoms of ketoacidosis are:

- loss of appetite
- weight loss
- vomiting
- excessive passing of urine
- altered consciousness
- coma.

Seek immediate medical advice if these symptoms occur.

Where to get help

- Your doctor
- Juvenile Diabetes Research Foundation Tel. (03) 9696 3866
- Diabetes Victoria Tel. 1300 437 386
- Life! Helping you prevent diabetes, heart disease and stroke Tel. 13 RISK (13 7475)
- Baker Heart and Diabetes Institute Tel. (03) 8532 1111

Things to remember

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- There is no cure, but the disorder can be successfully managed with medication, dietary modifications and exercise.