DIABETES MELLITUS TYPE 1

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Definition

Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin, a hormone needed to allow sugar (glucose) to enter cells to produce energy. The far more common type 2 diabetes occurs when the body becomes resistant to the effects of insulin or doesn't make enough insulin.

Various factors may contribute to type 1 diabetes, including genetics and exposure to certain viruses. Although type 1 diabetes typically appears during childhood or adolescence, it also can develop in adults.

Despite active research, type 1 diabetes has no cure, although it can be managed. With proper treatment, people who have type 1 diabetes can expect to live longer, healthier lives than they did in the past.

Symptoms

Type 1 diabetes signs and symptoms can come on quickly and may include:

- Increased thirst
- Frequent urination
- Bed-wetting in children who previously didn't wet the bed during the night
- Extreme hunger
- Unintended weight loss
- Irritability and other mood changes
- Fatigue and weakness
- Blurred vision
- In females, a vaginal yeast infection

When to see a doctor

Consult your doctor if you notice any of the above signs and symptoms in you or your child.

Causes

The exact cause of type 1 diabetes is unknown. In most people with type 1 diabetes, the body's own immune system which normally fights harmful bacteria and viruses mistakenly destroys the insulin-producing (islet) cells in the pancreas. Genetics may play a role in this process, and exposure to certain environmental factors, such as viruses, may trigger the disease.

The role of insulin

Once the islet cells are destroyed, you'll produce little or no insulin. Insulin is a hormone that comes from the pancreas, a gland situated behind and below the stomach.

- The pancreas secretes insulin into the bloodstream.
- The insulin circulates, enabling sugar to enter your cells.
- Insulin lowers the amount of sugar in your bloodstream.
- As your blood sugar level drops, so does the secretion of insulin from your pancreas.

The role of glucose

Glucose, (a sugar) is a main source of energy for the cells that make up muscles and other tissues.

- Glucose comes from two major sources: food and your liver.
- Sugar is absorbed into the bloodstream, where it enters cells with the help of insulin.
- Your liver stores glucose as glycogen.
- When your glucose levels are low, such as when you haven't eaten in a while, the liver converts stored glycogen into glucose to keep your glucose level within a normal range.

In type 1 diabetes, there's no insulin to let glucose into the cells, so sugar builds up in your bloodstream, where it can cause life-threatening complications.

The cause of type 1 diabetes is different from the cause of the more familiar type 2 diabetes. In type 2 diabetes, the islet cells are still functioning, but the body becomes resistant to insulin, or the pancreas doesn't produce enough insulin or both.

Risk factors

Some known risk factors for type 1 diabetes include:

- Family history: Anyone with a parent or sibling with type 1 diabetes has a slightly increased risk of developing the condition.
- Genetics: The presence of certain genes indicates an increased risk of developing type 1 diabetes.
- Geography. The incidence of type 1 diabetes tends to increase as you travel away from the equator. People living in Finland and Sardinia have the highest incidence of type 1 diabetes — about two to three times higher than rates in the United States and 400 times the incidence among people living in Venezuela.
- Age: Although type 1 diabetes can appear at any age, it appears at two noticeable peaks. The first peak occurs in children between 4 and 7 years old, and the second is in children between 10 and 14 years old.

Many other possible risk factors for type 1 diabetes have been investigated, though none have been proved. Some other possible risk factors include:

- Exposure to certain viruses, such as the Epstein-Barr virus, Coxsackie virus, mumps virus and cytomegalovirus
- Early exposure to cow's milk
- Low vitamin D levels
- Drinking water that contains nitrates
- Early (before 4 months) or late (after 7 months) introduction of cereal and gluten into a baby's diet
- Having a mother who had preeclampsia during pregnancy
- Being born with jaundice

Complications

Type 1 diabetes can affect major organs in your body, including heart, blood vessels, nerves, eyes and kidneys. Keeping your blood sugar level close to normal most of the time can dramatically reduce the risk of many complications.

Long-term complications of type 1 diabetes develop gradually, over decades: Good blood sugar management can help lower the risk of complications. Eventually, diabetes complications may be disabling or even life-threatening.

- Heart and blood vessel disease: Diabetes dramatically increases your risk of various cardiovascular problems, including coronary artery disease with chest pain (angina), heart attack, stroke, narrowing of the arteries (atherosclerosis) and high blood pressure.
- Nerve damage (neuropathy): Excess sugar can injure the walls of the tiny blood vessels (capillaries) that nourish your nerves, especially in the legs. This can cause tingling, numbness, burning or pain that usually begins at the tips of the toes or fingers and gradually spreads upward. Poorly controlled blood sugar could cause you to eventually lose all sense of feeling in the affected limbs.

Damage to the nerves that affect the gastrointestinal tract can cause problems with nausea, vomiting, diarrhea or constipation. For men, erectile dysfunction may be an issue.

- Kidney damage (nephropathy): The kidneys contain millions of tiny blood vessel clusters that filter waste from your blood. Diabetes can damage this delicate filtering system. Severe damage can lead to kidney failure or irreversible end-stage kidney disease, which requires dialysis or a kidney transplant.
- Eye damage: Diabetes can damage the blood vessels of the retina (diabetic retinopathy), potentially leading to blindness. Diabetes also increases the risk of other serious vision conditions, such as cataracts and glaucoma.
- Foot damage: Nerve damage in the feet or poor blood flow to the feet increases the risk of various foot complications. Left untreated, cuts and blisters can become serious infections, which often heal poorly and may ultimately require toe, foot or leg amputation.
- Skin and mouth conditions: Diabetes may leave you more susceptible to skin problems, including bacterial and fungal infections.
- Pregnancy complications: High blood sugar levels can be dangerous for both the mother and the baby. The risk of miscarriage, stillbirth and birth defects are increased when diabetes isn't well-controlled. For the mother, diabetes increases the risk of diabetic ketoacidosis, diabetic eye problems (retinopathy), pregnancy-induced high blood pressure and preeclampsia.

Lifestyle and home remedies

Following your diabetes treatment plan requires round-the-clock care, which can be frustrating at times. But realize that your efforts are worthwhile. Careful management of type 1 diabetes can reduce your risk of serious — even life-threatening — complications.

Consider these tips:

- Make a commitment to managing your diabetes: Take your medications as recommended. Learn all you can about type 1 diabetes. Make healthy eating and physical activity part of your daily routine. Establish a relationship with a diabetes educator, and ask your diabetes treatment team for help when you need it.
- Identify yourself: Wear a tag or bracelet that says you have diabetes. Keep a glucagon kit nearby in case of a low blood sugar emergency — and make sure your friends and loved ones know how to use it.
- Schedule a yearly physical exam and regular eye exams: Your regular diabetes checkups aren't meant to replace yearly physicals or routine eye exams. During the physical, your doctor will look for any diabetes-related complications, as well as screen for other medical problems. Your eye care specialist will check for signs of retinal damage, cataracts and glaucoma.
- Keep your immunizations up to date: High blood sugar can weaken your immune system. Get a flu shot every year. Your doctor will likely recommend the pneumonia vaccine, as well.

The Centers for Disease Control and Prevention (CDC) also recommends hepatitis B vaccination if you haven't previously been vaccinated against hepatitis B and you're an adult, ages 19 to 59 with type 1 or type 2 diabetes. The CDC advises vaccination as soon as possible after diagnosis with type 1 or type 2 diabetes. If you're age 60 or older and have diabetes and haven't previously received the vaccine, talk to your doctor about whether it's right for you.

- Pay attention to your feet: Wash your feet daily in lukewarm water. Dry them gently, especially between the toes. Moisturize your feet with lotion. Check your feet every day for blisters, cuts, sores, redness or swelling. Consult your doctor if you have a sore or other foot problem that doesn't heal.
- Keep your blood pressure and cholesterol under control: Eating healthy foods and exercising regularly can go a long way toward controlling high blood pressure and cholesterol. Medication may be needed, too.
- If you smoke or use other forms of tobacco, ask your doctor to help you quit: Smoking increases your risk of diabetes complications, including heart attack, stroke, nerve damage and kidney disease. In fact, smokers who have diabetes are three times more likely to die prematurely than are nonsmokers who have diabetes, according to the American Diabetes Association. Talk to your doctor about ways to stop smoking or to stop using other types of tobacco.
- If you drink alcohol, do so responsibly: Alcohol can cause either high or low blood sugar, depending on how much you drink and if you eat at the same time. If you choose to drink, do so only in moderation and always with a meal. And be sure to check your blood sugar levels before going to sleep.
- Take stress seriously: The hormones your body may produce in response to prolonged stress may prevent insulin from working properly, which can stress and frustrate you even more.

Take a step back and set some limits. Prioritize your tasks. Learn relaxation techniques. Get plenty of sleep.

Coping and support

Living with type 1 diabetes isn't easy. Diabetes management requires a lot of time and effort, especially in the beginning.

Diabetes can affect your emotions both directly and indirectly. Poorly controlled blood sugar can directly affect your emotions by causing behavior changes, such as irritability.

Diabetes may also make you feel different from other people. And there may be times you feel resentful that you always have to incorporate diabetes planning in everything you do.

People with diabetes have an increased risk of depression and diabetes-related distress, which may be why many diabetes specialists regularly include a social worker or psychologist as part of their diabetes care team.

You may find that talking to other people with type 1 diabetes is helpful. Support groups are available both online and in person. Support groups aren't for everyone, but they can be good sources of information. Group members often know about the latest treatments and tend to share their own experiences or helpful information, such as where to find carbohydrate counts for your favorite takeout restaurant.

If you're interested in a support group, your doctor may be able to recommend one in your area. Or you can visit the websites of Diabetes South Africa or the Centre for Diabetes and Endocrinology (CDE) for support group information.

Prevention

There's no known way to prevent type 1 diabetes. But researchers are working on preventing the disease or further destruction of the islet cells in people who are newly diagnosed. Ask your doctor if you might be eligible for one of these clinical trials, but carefully weigh the risks and benefits of any treatment available in a trial.

You can find more information on the types of research being done from TrialNet, a collaboration of diabetes researchers. TrialNet is also conducting a natural history study to check for diabetes genes in parents, children and siblings of people with type 1 diabetes.

Source: The Mayo Clinic

Contact us

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