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Type 2 Diabetes

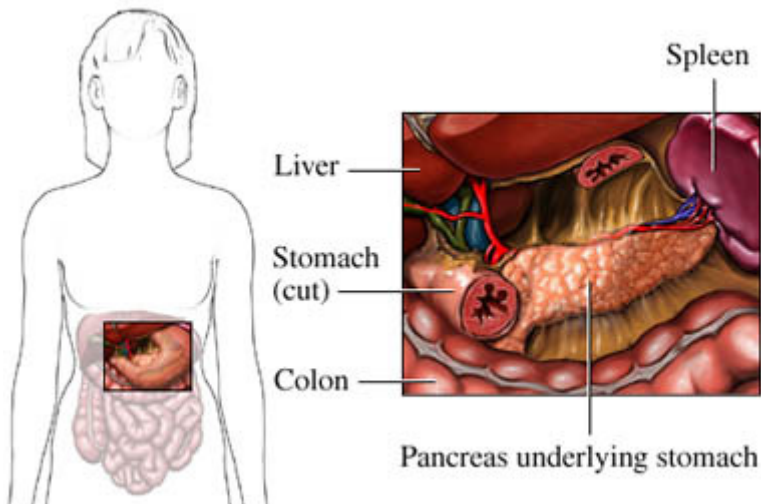
Definition

Glucose comes from the breakdown of food. It is the body's energy source. It can be absorbed from the blood into the cells with the help of a hormone called insulin. Without insulin, glucose will build up in the blood and cause hyperglycemia. At the same time, your body's cells are starved for glucose (energy).

A lack of insulin or resistance to insulin causes diabetes. In type 2 diabetes, the body is resistant to high levels of insulin. There is plenty of insulin in the body, but the cells are unable to use it.

High blood sugar levels over a long period of time can damage vital organs. This can include the kidneys, eyes, and nerves.

The Pancreas



Causes

Two conditions contribute to hyperglycemia in type 2 diabetes:

- Insulin resistance related to excess body fat
- Body's failure to make an adequate amount of insulin

Risk Factors

Factors that increase your chance for type 2 diabetes include:

- Having a family history of type 2 diabetes
- Being obese or overweight (especially excess weight in the upper body and abdomen)
- Eating a lot of meat, especially processed meat (eg, processed luncheon meats, hot dogs, sausages)
- Having cholesterol problems (low HDL "good" cholesterol and high triglycerides)
- Having high blood pressure
- Having a history of cardiovascular disease
- Having a history of gestational diabetes or having a baby that weighs over nine pounds
- Having an endocrine disorder (Cushing's syndrome, hyperthyroidism, acromegaly, polycystic ovary syndrome, pheochromocytoma, glucagonoma)
- Having a condition associated with insulin resistance (eg, acanthosis nigricans)
- Having previous blood test results that show impaired glucose tolerance and impaired fasting glucose
- Taking certain medicines (eg, pentamidine, nicotinic acid, glucocorticoids, thiazide)
- Having a sedentary lifestyle
- Having sleep difficulties
- Having a low birth weight
- Gender: more common in older women than men
- Race: African American, Hispanic, Native American, Hispanic American, Asian American, or Pacific Islander
- Age: 45 years or older and younger people who are obese and belong to at risk ethnic groups

Symptoms

You may not have symptoms for years. Symptoms due to high blood sugar or diabetic complications may include:

- Increased urination
- Extreme thirst
- Hunger
- Fatigue
- Blurry vision
- Irritability
- Frequent or recurring infections
- Poor wound healing
- Angina

Painful leg cramps when walking
Numbness or tingling in the hands or feet
In women: frequent vaginal yeast infections and urinary tract infections
Problems with gums
Itching
Impotence

Diagnosis

The doctor will ask about your symptoms and medical history. You will also be asked about your family history. A physical exam will be done.

Diagnosis is based on the results of blood testing. These guidelines are from the American Diabetes Association (ADA):

Symptoms of diabetes and a random blood test revealing a blood sugar level greater than or equal to 200 mg/dL [11.1 mmol/L]

Blood sugar tests after you have not eaten for eight or more hours (called fasting blood sugar) revealing blood sugar levels greater than or equal to 126 mg/dL (7.0 mmol/L) on two different days

Glucose tolerance test measuring blood sugar two hours after you consume glucose with a measurement greater than or equal to 200 mg/dL (11.1 mmol/L)

HbA1c level of 6.5% or higher, indicating poor blood sugar control over the past 2-4 months

mg/dL=milligrams per deciliter of blood; mmol/L=millimole per liter of blood

Treatment

Treatment aims to:

Maintain blood sugar at levels as close to normal as possible

Preventing or delaying complications (regular medical care is important for this)

Control other conditions that you may have, like high blood pressure and high cholesterol

Diet

Follow a balanced meal plan. Eat consistent and moderate amounts of food at regular times.

Nuts and peanut butter are a good choice for a snack. In women with diabetes, these snacks may help reduce the risk of cardiovascular disease.

Do not skip meals.

Eat plenty of vegetables and fiber.

Eat limited amounts of fat.

Eat moderate amounts of protein and low-fat dairy products.

Carefully limit foods containing high concentrated sugar.

Keep a record of your food intake. This will help a dietitian or doctor advise you.

Weight Loss

If you are overweight, talk to your doctor about a reasonable weight goal. You and your doctor can develop a safe diet program for you. Weight loss will help your body respond better to insulin.

Group education may help people recently diagnosed with their goals in weight loss.

Exercise

Physical activity:

- Can make the body become more sensitive to insulin

- Will help you reach and maintain a healthy weight

- Can lower the levels of fat in your blood

- Has been found to improve blood sugar control— Aerobic fitness, and resistance training can help to improve HbA1c levels. Researchers have also found that long-term strength and endurance training may improve HbA1c, even in the absence of weight loss.

Talk to your doctor about any restrictions. Work with your doctor to make an activity plan. Even a brief counseling session may help to increase your activity levels.

Diabetes is a risk factor for heart disease. Exercising can help to reduce your risk for heart disease.

Oral Medication

Medicines taken by mouth may be used to lower blood sugar:

- Metformin: a class of drug that reduces the body's production of glucose. It also makes the body more sensitive to insulin. This combination will help keep blood sugar levels within the normal limits.

- Drugs that prompt the cells in the pancreas to make more insulin (eg, sulfonylureas [glyburide, tolazamide], dipeptidyl peptidase-4 inhibitors [saxagliptin, sitagliptin], repaglinide [Prandin])

 - The FDA has warned that sitagliptin may increase the risk of acute pancreatitis.

- Insulin sensitizers—a class of drugs that help the body better use insulin (eg, pioglitazone)

- Starch blockers—a class of drugs (eg, acarbose, miglitol) that lessen glucose absorption into the bloodstream

Injectable medicine, such as:

- Incretin-mimetics (eg, exenatide) stimulate the pancreas to produce insulin and suppress appetite often leading to weight loss (twice daily injections).

- Amylin analogues (eg, pramlintide) replace a protein that is normally produced by the pancreas and is low in people with type 2 diabetes (injection before each meal).

Talk to your doctor about your drug program.

Insulin

In some cases the body does not make enough insulin. Insulin injections may be needed.

This is needed when blood sugar levels are not kept low enough with lifestyle change and medicine.

Blood Sugar Testing

Checking blood sugar levels during the day can help you stay on track. It will also help your doctor determine if your treatment is working. Testing is easy with a monitor. Keeping track of blood sugar levels is especially important if you take insulin. Frequency of testing is determined by how well your blood sugar control is doing.

The HbA1c may also be done at your doctor's office. Doctors advise that most keep their HbA1c levels below 7% (ADA recommendation). This level has been shown to lead to fewer diabetic complications.

Regular blood sugar testing may not be needed in patients with type 2 diabetes. It may not be needed for those whose condition is under reasonably good control without insulin. Talk with your doctor before stopping blood sugar monitoring.

Alternative Therapies

One study focused on people with a specific type 2 diabetes. When given vitamin E, they showed a decrease in the rates of heart problems.

Prevention

Lifestyle changes seem to be most effective. To reduce your chances of developing type 2 diabetes:

- Participate in regular physical activity.

- Maintain a healthy weight.

- Drink alcohol in moderation (two drinks per day for a man, and one drink per day for a woman)

- Eat a well-balanced diet:

 - Get enough fiber

 - Avoid fatty foods

 - Limit sugar intake

RESOURCES:

American Diabetes Association

<http://www.diabetes.org/>

National Diabetes Information Clearinghouse

<http://diabetes.niddk.nih.gov>

CANADIAN RESOURCES:

Canadian Diabetes Association

<http://www.diabetes.ca>

Team Diabetes Canada

Canadian Diabetes Association

http://www.diabetes.ca/section_donations/TeamDiabetesIndex.asp

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