



Diabetic nephropathy (kidney disease)

Overview

Diabetic nephropathy is a serious complication of type 1 diabetes and type 2 diabetes. It's also called diabetic kidney disease. In the United States, about 1 in 3 people living with diabetes have diabetic nephropathy.

Diabetic nephropathy affects the kidneys' ability to do their usual work of removing waste products and extra fluid from your body. The best way to prevent or delay diabetic nephropathy is by maintaining a healthy lifestyle and adequately managing your diabetes and high blood pressure.

Over many years, the condition slowly damages your kidneys' delicate filtering system. Early treatment may prevent or slow the disease's progress and reduce the chance of complications.

Kidney disease may progress to kidney failure, also called end-stage kidney disease. Kidney failure is a life-threatening condition. At this stage, treatment options are dialysis or a kidney transplant.

Symptoms

In the early stages of diabetic nephropathy, you would most likely not notice any signs or symptoms. In later stages, signs and symptoms may include:

- Worsening blood pressure control
- Protein in the urine
- Swelling of feet, ankles, hands or eyes
- Increased need to urinate
- Reduced need for insulin or diabetes medicine
- Confusion or difficulty concentrating
- Shortness of breath
- Loss of appetite
- Nausea and vomiting
- Persistent itching
- Fatigue

When to see a doctor

Make an appointment with your doctor if you have any signs or symptoms of kidney disease. If you are living with diabetes, visit your doctor yearly — or as recommended — for tests that measure kidney function.

Causes

Diabetic nephropathy results when diabetes damages blood vessels and other cells in your kidneys.

How the kidneys work

Your kidneys contain millions of tiny blood vessel clusters (glomeruli) that filter waste from your blood. Severe damage to these blood vessels can lead to diabetic nephropathy, decreased kidney function and kidney failure.

Diabetic nephropathy causes

Diabetic nephropathy is a common complication of type 1 and type 2 diabetes.

Over time, poorly controlled diabetes can cause damage to blood vessel clusters in your kidneys that filter waste from your blood. This can lead to kidney damage and cause high blood pressure.

High blood pressure can cause further kidney damage by increasing the pressure in the delicate filtering system of the kidneys.

Risk factors

If you're living with diabetes, factors that can increase your risk of diabetic nephropathy include:

- Uncontrolled high blood sugar (hyperglycemia)
- Uncontrolled high blood pressure (hypertension)
- Being a smoker
- High blood cholesterol
- Obesity
- A family history of diabetes and kidney disease

Complications

Complications of diabetic nephropathy may develop gradually over months or years. They may include:

- Fluid retention, which could lead to swelling in your arms and legs, high blood pressure, or fluid in your lungs (pulmonary edema)
- A rise in potassium levels in your blood (hyperkalemia)

- Heart and blood vessel disease (cardiovascular disease), which could lead to stroke
- Damage to the blood vessels of the light-sensitive tissue at the back of the eye (diabetic retinopathy)
- Reduced number of red blood cells to transport oxygen (anemia)
- Foot sores, erectile dysfunction, diarrhea and other problems related to damaged nerves and blood vessels
- Bone and mineral disorders due to the inability of the kidneys to maintain the right balance of calcium and phosphorus in the blood
- Pregnancy complications that carry risks for the mother and the developing fetus
- Irreversible damage to your kidneys (end-stage kidney disease), eventually needing either dialysis or a kidney transplant for survival

Prevention

To reduce your risk of developing diabetic nephropathy:

- **Keep regular appointments for diabetes management.** Keep annual appointments — or more-frequent appointments if recommended by your health care team — to monitor how well you are managing your diabetes and to screen for diabetic nephropathy and other complications.
- **Treat your diabetes.** With effective treatment of diabetes, you may prevent or delay diabetic nephropathy.
- **Manage high blood pressure or other medical conditions.** If you have high blood pressure or other conditions that increase your risk of kidney disease, work with your doctor to control them.
- **Follow instructions on over-the-counter medications.** Follow instructions on the packages of nonprescription pain relievers such as aspirin and nonsteroidal anti-inflammatory drugs, such as naproxen (Aleve) and ibuprofen (Advil, Motrin IB, others). For people with diabetic nephropathy, taking these types of pain relievers can lead to kidney damage.
- **Maintain a healthy weight.** If you're at a healthy weight, work to maintain it by being physically active most days of the week. If you need to lose weight, talk with your doctor about weight-loss strategies, such as increasing daily physical activity and consuming fewer calories.
- **Don't smoke.** Cigarette smoking can damage your kidneys and make existing kidney damage worse. If you're a smoker, talk to your doctor about strategies for quitting smoking. Support groups, counseling and some medications can all help you to stop.

By Mayo Clinic Staff

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