Is Nerve Damage a Complication of Diabetes?

by COLLEEN KELLY

Diabetic Neuropathy: What Can Be Done for Diabetic Nerve Pain?

I'm about to see a patient. As a certified diabetes educator (CDE), they're coming to see me because they have some form of diabetes. Their physician has sent them to my office because they require education – they may need to start insulin, or they have a new diagnosis, or they may be having a difficult time managing their diabetes.

I review their medical history. "Neuropathy," I often read.

More often than not, if neuropathy is listed in the medical history of someone with diabetes, they are related.

What Is Diabetic Neuropathy?

Neuropathy is a condition of the nerves – it means that the nerves have been damaged. When diabetes has caused this damage, it is called "diabetic neuropathy."

According to the National Institute of Diabetes and Digestive and Kidney Diseases, diabetic neuropathy is caused by a multitude of factors – "high blood glucose levels, also called blood sugar, and high levels of fats, such as triglycerides, in the blood from diabetes can damage your nerves."

Although you may most commonly attribute diabetic neuropathy with a tingling sensation in your feet, there are various types of diabetic neuropathy:

- ***Peripheral neuropathy*** is caused by damage to the nerves of the peripheral nervous system. This is the type of neuropathy that you most often attribute with neuropathy, as it affects the hands and the feet. It is estimated that one-third to one-half of people with diabetes have peripheral neuropathy.
- ***Autonomic neuropathy*** is caused by damage to the nerves of the internal organs. This leads to issues with the stomach and digestion (gastroparesis), heart rate and blood pressure, the bladder, the sex organs, sweat glands, and the eyes. It can also lead to the inability to detect hypoglycemia, causing a condition known as hypoglycemia unawareness.
- ***Focal neuropathies*** affect a single nerve. For example, a single nerve may be damaged in the torso, leg, hand, or arm. An example of a focal neuropathy is carpal tunnel syndrome.
- ***Proximal neuropathy*** is a very rare type of neuropathy. It is also very disabling; nerve damage is experienced in the hip, buttock, or thigh on only one side of the body and can take months or years to improve.

What Causes Diabetic Neuropathy?

Sometimes, the development of diabetic neuropathy is inevitable. For example, genetic predisposition does play a role in the development of diabetic neuropathy. An autoimmune response can also cause diabetic neuropathy.

However, there are other factors to consider in the development of diabetic neuropathy.

For many people, the development of diabetic neuropathy is related to blood glucose control. Having elevated blood glucose levels for a prolonged period of time can damage the nerves, thus causing diabetic neuropathy. It is thought that this could happen because “High blood sugar interferes with the ability of the nerves to transmit signals. It also weakens the walls of the small blood vessels (capillaries) that supply the nerves with oxygen and nutrients.”

And if you needed another reason to quit smoking, here it is! Smoking damages both the nerves and the blood vessels, as well as increases the risk of infections.

The longer you have diabetes, the higher your risk of developing diabetic neuropathy climbs. This risk is even higher if you have blood glucose levels that are not well controlled if you are overweight, and if you have kidney disease.

Diabetic Neuropathy Symptoms

If you suspect you have diabetic neuropathy, but you have not been diagnosed, you’ll want to make a note of the following symptoms.

Symptoms of peripheral neuropathy (note that these will be felt in the extremities):

- A tingling sensation.
- Numbness or reduced ability to feel pain and/or temperature changes.
- Muscle weakness.
- Loss of balance and coordination.
- Increased sensitivity to touch.
- Sharp pains.
- Loss of reflexes.
- Serious foot problems; examples include ulcers, bone and joint pain, infections, and deformities.

Symptoms of autonomic neuropathy:

- Hypoglycemia unawareness.
- Difficulty swallowing.
- Bladder problems (such as incontinence, urinary retention, and urinary tract infections).
- Constipation.
- Diarrhea.
- Increased heart rate at rest.
- Erectile dysfunction.
- Vaginal dryness.
- The inability of your body to regulate your blood pressure and heart rate, which can lead to sharp drops in blood pressure when standing.
- Problems with regulating body temperature.

Diagnosis of Diabetic Neuropathy

Your physician likely does routine foot exams where she checks for diabetic neuropathy. During the foot exam, she may make a diagnosis of diabetic neuropathy.

In addition to using assessment skills that will check muscle strength and tone, tendon reflexes, and temperature, your physician will also make a diagnosis of diabetic neuropathy using the following tests:

- A **monofilament**, which is a soft nylon fiber, is placed on various areas of the extremities. Your provider will be detecting sensitivity to touch as well as vibration.

- **Nerve conduction studies** can be used to diagnose neuropathies such as carpal tunnel syndrome by measuring how quickly your extremities respond to conduct electrical signals.
- **Electromyography (EMG)** is used with nerve conduction studies to measure the electrical discharges produced by the muscles.
- **Autonomic testing** is used when your physician suspects autonomic neuropathy. It will assess the ability to sweat and as well as look at your blood pressure in different positions.

Next page: How is diabetic neuropathy treated? Can neuropathy be prevented? And more.

Treatment of Diabetic Neuropathy With Medications

As there is no cure for diabetic neuropathy, Mayo Clinic states that there are three treatment goals for this condition:

1. Slowing the progression.
2. Minimizing pain.
3. Minimizing complications and restoring function.

As you can imagine, much of this involves controlling blood glucose levels. However, your physician may also require you to take medications to control your blood pressure as well as cholesterol.

To treat pain associated with neuropathy, you there are many options available:

- **Anti-seizure medications.** Although they are used to control seizure disorders, they are also known to treat pain associated with nervous system disorders. Examples include gabapentin (Neurontin), pregabalin (Lyrica), and carbamazepine (Tegretol).
- **Antidepressants.** These medications are used to treat depression, but also can be used to treat mild to moderate pain "by interfering with chemical processes in your brain that cause you to feel pain." Examples include amitriptyline, desipramine (Norpramin), and imipramine (Tofranil).

For men who experience sexual dysfunction associated with neuropathy, your physician may prescribe medications such as sildenafil (Viagra), tadalafil (Cialis), or vardenafil (Levitra).

Natural Treatment of Diabetic Neuropathy

At the risk of sounding like a broken record… the best way to treat diabetic neuropathy is to keep your blood glucose levels under control! If you haven't been consistent with taking your insulin and/or your medication, begin now. Keep blood glucose logs and record your insulin doses and when you take your medications, and share these logs with your medical team so they can make adjustments to your regimen as indicated.

Ask your physician for a referral to speak with a registered dietitian (RD). An RD can create a meal plan that is both heart healthy and will promote glucose control. If you have other comorbid conditions, they can help with that too!

And while you're at it – get moving! The American Diabetes Association recommends 30 minutes of exercise on most days of the week. Exercise can keep your blood glucose and blood pressure levels under control. Keep in mind if your neuropathy is severe, your physician may have specific exercise recommendations, so speak with your doctor before beginning an exercise routine.

Options to Help Relieve Diabetic Neuropathy Naturally

To relieve pain, here are some alternative remedies that you can try:

- **Capsaicin cream.** This cream is made out of the same "spicy" stuff that is in chili peppers! It is applied

topically to areas of pain.
- **Acupuncture.** This is thought to relieve pain associated with neuropathy. It typically requires more than one session to provide relief.
- **Alpha-lipoic acid.** This is an antioxidant that is found in certain foods and may reduce the pain associated with neuropathy. It can be found in broccoli, yams, spinach, potatoes, yeast, tomatoes, Brussels sprouts, carrots, beets, rice bran, and red meat. It is an unproven treatment, so there is no "recommended amount" if you choose to take it in supplement form, but one study indicated that 600 milligrams daily was beneficial.

Can Diabetic Neuropathy be Reversed?

The nerve damage associated with diabetic neuropathy is irreversible.

However, nerve damage can be slowed considerably. For example, it is not uncommon for a person who has not been to the doctor for many years to have "tingling" in their feet as their first symptom of diabetes. They present to a doctor (or the emergency department!) and find that they have diabetes – and neuropathy! With proper treatment, they quickly control their diabetes, as well as their neuropathy symptoms.

Does this mean that their neuropathy has gone away? No, not at all. It means that they have controlled it – and perhaps halted its progression for the time being.

Is Diabetic Neuropathy a Complication of Untreated Diabetes?

Yes, absolutely. But not everyone with diabetes goes on to develop diabetic neuropathy. And not every neuropathy is related to diabetes.

It is a misconception that someone with peripheral neuropathy must have diabetes. There are many other causes of peripheral neuropathy:

- Alcoholism.
- Certain autoimmune diseases, such as lupus, Sjogren's syndrome, rheumatoid arthritis, Guillain-Barre syndrome, necrotizing vasculitis, and chronic inflammatory demyelinating polyneuropathy.
- Exposure to certain toxins, such as heavy metals and chemicals.
- Trauma to the nerves, such as in a motor vehicle accident.
- Certain medications, such as chemotherapy.
- Specific infections, such as Epstein-Barr virus, diphtheria, HIV, Lyme disease, shingles, leprosy, and shingles.
- Certain inherited neuropathies, such as Charcot-Marie-Tooth disease.
- Developing a tumor that presses on the nerves can cause neuropathy.
- Vitamin deficiencies, especially vitamins B-1, B-6, B-12, vitamin E, and niacin, can all cause neuropathy.
- Bone marrow disorders such as monoclonal gammopathies, osteoclastic myeloma, and lymphoma, are all likely to cause neuropathy.

How to Prevent Diabetic Neuropathy

Unfortunately, sometimes diabetic neuropathy is unavoidable. However, there is one major thing that you can do to prevent diabetic neuropathy.

Do your best to control your blood glucose levels!

Your treatment plan is individualized to you by your medical team. This may mean taking insulin, oral medications or injectable medications (or a combination of any of the above). Regardless of the type of diabetes you have, it also likely means a healthy diet and exercise. And following your treatment plan (and altering it with your medical team when it isn't working) will give you the best chance at preventing diabetic neuropathy.

Part of keeping your blood glucose levels in check is getting your A1c monitored routinely. The American Diabetes Association recommends getting your A1c drawn at least twice yearly, although your physician may prefer to have it drawn every three months.

Having a foot exam yearly by your physician is also recommended. Why? Because foot problems are sometimes one of the first signs of peripheral neuropathy. You can also perform diabetic foot care at home:

- **Check your feet daily.** Check for cuts, scrapes, blisters, redness, and swelling. Ask a friend or family member for help if you can't see your whole foot, or use a mirror if you need to. If anything looks unusual, let your physician know.
- **Keep your feet clean and dry.** Use lotion if your feet are dry, but avoid using lotion between your toes.
- **Wear clean, dry socks and shoes that fit well.** Shoes that are too big or too small can cause blisters and cuts. A podiatrist can help if you need assistance obtaining properly fitted shoes.

The Bottom Line…

Prevention of diabetic neuropathy is of the utmost importance – but as we discussed, sometimes it is inevitable. Adequate blood glucose control is important in the case of prevention and in the case of neuropathy treatment. Also, know that there are ways to treat neuropathy so that you can feel your best – but part of treatment involves you, too!