

Diabetes can affect you from your head to your toes. Poorly controlled blood sugar can lead to a range of health problems over time.

The longer you've had diabetes, the higher your risk for complications becomes. It's essential that you learn about the potential long-term effects of type 2 diabetes and steps you can take to prevent them from occurring.

1. High blood pressure

Many people with type 2 diabetes have issues with high blood pressure. If this isn't treated, your risk of heart attack, stroke, vision problems, and kidney disease can increase.

You should monitor your blood pressure on a regular basis. A low-sodium diet, regular exercise, and stress reduction can keep your blood pressure in check. Your doctor can also prescribe medications to treat hypertension.

2. Cardiovascular disease

Over time, uncontrolled blood sugar can cause damage to your arteries. Diabetes also tends to raise triglycerides and LDL cholesterol. This type of cholesterol can clog your arteries and increase your risk of having a heart attack.

People with diabetes are more likely to develop heart disease. Addressing the main risk factors of heart disease can prevent this.

This includes managing your blood pressure and cholesterol levels, maintaining a healthy weight, eating a healthier diet, and getting regular exercise. Smoking doubles the risk of heart disease in people with diabetes. If you smoke cigarettes, consider quitting.

3. Stroke

Most strokes occur when a blood clot blocks a blood vessel in the brain. People with diabetes are 1.5 times more likely to have a stroke, according to the American Diabetes Association.

Other factors that increase your risk of a stroke include high blood pressure, smoking, heart disease, high cholesterol, and being overweight.

4. Vision problems

Diabetes can cause damage to the tiny blood vessels in your eyes. This increases your chances of developing serious eye conditions, such as:

- glaucoma, which is when fluid pressure builds up in your eye
- cataracts, or the clouding of the lens of your eye
- diabetic retinopathy, when blood vessels in the back of your eye (retina) become damaged

These conditions can result in vision loss over time.

Make sure to schedule regular eye exams with an ophthalmologist. Any change in your vision should be taken seriously.

5. Nerve damage

Your risk for nerve damage and pain, known as diabetic neuropathy, increases the longer you've had type 2 diabetes. About half of people with type 2 diabetes will develop neuropathy, the most common diabetes complication. At first, you might have no symptoms or feel a mild tingling or numbness in your hands or feet. It can also affect the nerves that control organs in your body, which is called autonomic neuropathy.

Depending on which nerves are affected, symptoms may include:

- numbness, tingling, or burning in your hands or feet
- stabbing or shooting pains
- vision problems

- sensitivity to touch
- diarrhea
- loss of balance
- weakness

The biochemical reason for the neuropathy is the accumulation of toxic amyloid beta in the nerve cells (the same pathology as in Alzheimer Disease). The secretome of mesenchymal stem cells reduces the production of this toxic protein and also dissolves existing protein aggregates within the cells.

6. Kidney damage

If your blood sugar levels aren't properly managed, this can lead to kidney disease. Over time, high blood glucose thickens and scars the nephrons, tiny structures within the kidneys that filter your blood. About 7% of the time, you'll already have protein leaking into your urine—an early sign of kidney problems—by the time you receive a type 2 diabetes diagnosis.

About half of those who don't take steps to control their diabetes will sustain kidney damage within 10 years, and 40% of those will progress to kidney failure.

Visit your doctor at least once a year to have your urine checked for protein. Protein in the urine is a sign of kidney disease.

7. Depression

While scientists don't fully understand the link between diabetes and depression, they do know that people with diabetes are at a higher risk of experiencing depression.

In evolutionary terms, the neurohormonal changes that occur during acute stress are expected to last only for a short period. However, intense acute stress or frequent sustained stresses over a long period cause the negative biochemical and neurohormonal changes to become persistent. The adverse health issues of unmanaged stress and inappropriate or pathological responsiveness of the stress system affect and disrupt many bodily systems, including endocrine system; digestive system, impairment of the immune system, changes in appetite and alteration of metabolism (weight gain or loss), cardiovascular dysfunction (hypertension, tachycardia, hyperlipidemia and hyperglycaemia), nervous system

manifestations, and impaired memory. Patients have increased serum epinephrine and norepinephrine levels, pro-opiomelanocortin-derived peptides, thyroid hormones, but have inappropriately low glucocorticoid levels. These abnormal hormonal, metabolic responses and mitochondrial, biochemical, and neurohormonal abnormalities lead to structural brain vicissitudes occurring in the amygdala and hippocampus.

Preclinical in vitro studies by myself on horses, has shown that hippocampus associated neuronal disorders can be managed with mesenchymal stem cell derived secretome.

8. Gastroparesis

If blood sugar levels remain high over a long period of time, damage to the vagus nerve can occur. The vagus nerve is the nerve that controls the movement of food through the digestive tract.

Gastroparesis arises when the vagus nerve is damaged or stops working. When this happens, the stomach takes longer than normal to empty its contents. This is called delayed gastric emptying.

Symptoms of gastroparesis include:

- nausea and vomiting
- heartburn
- feeling of fullness
- bloating
- loss of appetite
- weight loss
- stomach spasms

Gastroparesis can also make it more difficult to manage blood glucose levels since food absorption is less predictable. The best way to prevent gastroparesis is to manage your blood sugar levels over time. If you do develop gastroparesis, you'll need to work with your doctor to adjust your insulin regimen.

You should also avoid eating high-fiber, high-fat foods, as they take longer to digest. Also, try eating small meals throughout the day.

9. Dementia

Scientists have recently established a link between type 2 diabetes and Alzheimer's disease, the most common type of dementia. Too much sugar in the blood can damage the brain over time, so it's important to keep your blood sugar levels under control.

Brain health issues

It appears that people with diabetes have some abnormalities of blood flow control to the brain. This appears to be correlated with a more rapid loss of mental function with age, including the ability to plan, organize, remember things, prioritize, pay attention, and get started on tasks.

To protect your brain health, you'll want to stay active physically and mentally, logging at least 30 minutes of exercise a day and keeping your mind stimulated. The connection between Diabetes and Brain damage or Alzheimer's Disease is the accumulation of a toxic protein in the cells, called amyloid beta. The secretome of mesenchymal stem cells decreases the production of this toxic protein and also removes the toxic protein aggregates in the cells.

10. Tooth decay

In poorly managed diabetes, small blood vessels often become damaged. This includes the small blood vessels that help nourish your teeth and gums, which puts you at increased risk of tooth decay and gum infections.

To reduce your risk of dental issues, see a dentist every six months for a checkup. Brush your teeth with a fluoride-containing toothpaste, and floss at least once a day.

Prevention

Also consider making changes to your diet and exercise routine. Avoid sugar and high-carbohydrate, processed foods. This includes candy, sugary drinks, white bread, rice, and pasta.

Combine aerobic exercise with strength training, and find ways to reduce your stress levels. All of this can help you maintain a healthy weight.

Assemble a healthcare team and schedule regular checkups. Your healthcare team may include a diabetes educator, endocrinologist, ophthalmologist, cardiologist, neurologist, podiatrist, and a dietician, among others. Your primary care physician can help you understand which specialists you should be visiting on a regular basis.

Treatment with mesenchymal stem cell derived secretome and activated dendritic cells from peripheral blood monocytes have a scientifically proven effect on diminishing the production of toxic amyloid beta, dissolving existing amyloid beta aggregates in neurons and beta cells of the pancreas, act neuroprotective and neuroregenerative as well as being immunomodulating.

First clinical trials on the treatment of Diabetes type 2 with Insulin producing cells from mesenchymal stem cells, replacing the defective beta cells of the pancreas, will start in autumn 2021.