

Diabetes and cognitive decline

According to the American Diabetes Association, 25% of people age 65 and older in the United States have diabetes (diagnosed and undiagnosed), and about half have prediabetes.

Doctors don't yet understand exactly how cognitive decline and diabetes are connected, but they do know that high blood sugar or insulin can harm the brain in several ways:

- Diabetes raises the risk of heart disease and stroke, which hurt the heart and blood vessels. Damaged blood vessels in the brain may contribute to cognitive decline.
- The brain depends on many different chemicals, which may be unbalanced by too much insulin. Some of these changes may help trigger cognitive decline.
- High blood sugar causes inflammation. This may damage brain cells and cause dementia to develop.

Most people with diabetes have Type 2, which is linked to lack of exercise and being overweight. When diabetes is not controlled, too much sugar remains in the blood. Over time, this can damage organs, including the brain. Scientists are finding more evidence that could link Type 2 diabetes with Alzheimer's disease, the most common cause of dementia. Several research studies following large groups over many years suggest that adults with Type 2 diabetes have a higher risk of developing Alzheimer's.

What research has shown about the relationship between diabetes and cognitive decline

- People with Type 1 diabetes are at greater risk of dementia than people without diabetes. According to the one study's results, Type 1 diabetics were 93% more likely to develop dementia.
- There's a strong correlation between Alzheimer's disease and high blood sugar levels. One study found that people with high blood sugar levels — such as those linked with Type 2 diabetes — had a dramatic increase in beta-amyloid protein, a protein toxic to cells in the brain.
- People in the early stages of Type 2 diabetes have signs of brain dysfunction. In fact, one study's participants showed high levels of insulin resistance in the brain

and a reduced ability to use glucose to fuel normal brain function.

- Individuals with Type 2 diabetes show accelerated cognitive decline, specifically in executive function and information-processing speed.
- The early effects of diabetes on the brain were related to levels of a blood protein called hemoglobin A1C (HbA1C). Researchers found that even people who had diabetes for less than 10 years had deficits in memory function typically associated with a brain region called the hippocampus. They found that people with diabetes had smaller hippocampal sizes than people without diabetes. They also discovered that the decreases in hippocampal size were correlated to HbA1C blood levels, suggesting that HbA1C could be used to indicate hippocampal function and/or the onset of memory loss.
- The amyloid precursor protein gene, known to be involved in some cases of Alzheimer's, affects the insulin pathway. Disruption of this pathway is a hallmark of diabetes. The research could point to a therapeutic target for both diseases.

Reducing risk for diabetes

Preventing diabetes may not stop dementia from developing, but simple lifestyle changes can help avoid diabetes and cut the risk, including:

- Losing at least 5% of body weight — just 10 pounds in someone weighing 200 pounds.
- Exercising at least 30 minutes, five days per week.
- Eating a healthy, low-fat diet.

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