

Blood sugar highs and lows linked to greater dementia risk in type 1 diabetes

June 2 2021

Older people with type 1 diabetes who have been to the hospital at some point for both low and high blood sugar levels may be at six times greater risk for developing dementia years later. The research is published in the June 2, 2021, online issue of *Neurology*. The study also found that people with type 1 diabetes who visit the hospital for just one of the blood sugar extremes may also be at greater risk for developing dementia.

Type 1 [diabetes](#) is a chronic condition in which the pancreas produces little or no insulin.

Hypoglycemia is [low blood glucose](#), or the main [sugar](#) in [blood](#), that may result in loss of consciousness. Hyperglycemia results from insulin deficiency or extremely [high blood sugar](#) and dehydration. This study looked at severe glycemic events, which were defined as episodes of high or low blood sugar that resulted in an emergency room visit or hospital stay.

"For people with diabetes, both severely high and low blood sugar levels are emergencies and both extremes can largely be avoided. However, when they do occur, they can lead to coma, increased hospitalization and even death," said study author Rachel A. Whitmer, Ph.D., of the University of California Davis School of Medicine in Sacramento, Calif. "People with type 1 diabetes are living longer than before, which may place them at risk of conditions such as [dementia](#). If we can potentially decrease their risk of dementia by controlling their blood sugar levels,

that could have [beneficial effects](#) for individuals and [public health](#) overall."

The study looked at 2,821 people with an average age of 56 who had type 1 diabetes. Of those, 398, or 14%, had a history of severe low blood sugar; 335, or 12%, had a history of severe high blood sugar and 87, or 3%, had both. Researchers followed up with the people for an average of seven years to determine who had been diagnosed with dementia.

Researchers found that 153 people, or about 5%, developed dementia. After adjusting for age, sex and ethnicity, the people with low blood sugar events had a 75% greater risk of developing dementia than those without one. People with high blood sugar events had more than twice the risk of developing dementia than those without one.

However, the people who experienced both types of events had more than six times the risk of developing dementia than people who had neither event.

Researchers also looked at dementia incidence rates. After adjusting for age, the incidence rate of dementia in people with low blood sugar events was 26.5 cases for every 1,000 person-years compared to 13.2 for people without. Person-years take into account the number of people in a study as well as the amount of time spent in the study. The incidence rate of dementia in people with high blood sugar events was 79.6 cases for every 1,000 person-years, compared to 13.4 for people without.

For people who had both high and low blood sugar events at various times, the incidence rate of dementia was 98.5 for every 1,000 person-years, compared to 12.8 for those who had neither.

"Our findings suggest that exposure to severe glycemic events may have long-term consequences on brain health and should be considered

additional motivation for people with diabetes to avoid severe glycemic events throughout their lifetime," Whitmer said.

A limitation of the study is that people had to be diagnosed with dementia by a [health care provider](#) to be counted as having dementia. Since many dementia cases go undiagnosed, this may have resulted in underreporting the number of dementia cases. Whitmer noted that the study was not designed to determine whether high and [low blood sugar](#) events caused dementia. It only showed an association.

Provided by American Academy of Neurology

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