

# Severe hypoglycemia linked with higher risk of dementia for older adults with diabetes

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Having hypoglycemic (low blood sugar level) episodes that are severe enough to require hospitalization are associated with a greater risk of dementia for older adults with type 2 diabetes, according to a study in the April 15 issue of *JAMA*, a theme issue on diabetes.

Rachel A. Whitmer, Ph.D., of Kaiser Permanente, Oakland, Calif., presented the findings of the study at a *JAMA* media briefing at the National Press Club in Washington, D.C.

Hypoglycemic episodes may include dizziness, disorientation, fainting or seizures. While most hypoglycemia is mild and self-managed, more severe hypoglycemia can require hospitalization. Although some studies have reported an association between history of hypoglycemia and impaired cognitive functioning in children and young adults with type 1 [diabetes](#), no studies have evaluated whether or to what extent hypoglycemic episodes are a risk factor for the development of dementia in populations of older patients, who are more likely to have type 2 diabetes than type 1. "With the increasing prevalence of type 2 diabetes worldwide, and potentially of hypoglycemia and dementia among patients with diabetes, the relationship between these conditions should be evaluated," the authors write.

Dr. Whitmer and colleagues conducted a study to determine whether prior episodes of hypoglycemia that required hospitalization or emergency department (ED) visits are associated with an increased risk of dementia. The study, that included 22 years (1980-2002) of follow-up

for hypoglycemic episodes and more than 4 years (starting in 2003) of follow-up for diagnosis of dementia, included 16,667 patients with type 2 diabetes (average age, 65 years).

The researchers found that a total of 1,822 patients (11 percent) had a diagnosis of dementia and 1,465 patients (8.8 percent) had at least 1 episode of hypoglycemia; 250 patients had both dementia and at least 1 episode of hypoglycemia (16.95 percent). Age-adjusted incidence rates of dementia by frequency of hypoglycemic episodes were significantly elevated for patients with at least 1 episode compared with patients with no episodes. "Specifically, we observed a 2.39 percent increase in absolute risk of dementia per year of follow-up for patients with history of hypoglycemia, compared with patients without a history. Although this 1-year absolute risk difference is modest, the cumulative effects would be sizeable," the authors write.

Compared with patients with no hypoglycemia, patients with single or multiple episodes had a graded increase in risk of dementia. Patients with 1 hypoglycemic episode had a 26 percent increased risk; 2 episodes, an 80 percent increased risk; and 3 or more hypoglycemic episodes were associated with nearly double the risk for dementia.

"Our results suggest that hypoglycemic episodes severe enough to require hospitalization or an ED visit are associated with increased risk of dementia, particularly for patients who have a history of multiple episodes," the researchers write.

"A large body of evidence suggests that individuals with diabetes are at an increased risk of dementia, yet exact mechanisms are not known; our study suggests a potentially modifiable mechanism. Pharmacologically induced severe hypoglycemia may be associated with neurological consequences in an older population already susceptible to [dementia](#). More scientific studies examining hypoglycemia and cognitive

performance and brain-imaging sequelae in populations of older [patients](#) with [type 2 diabetes](#) are needed."

More information: JAMA. 2009;301[15]:1565-1572.

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