

Diabetes in midlife linked to significant cognitive decline 20 years later

1 December 2014



People diagnosed with diabetes in midlife are more likely to experience significant memory and cognitive problems during the next 20 years than those with healthy blood sugar levels, new Johns Hopkins Bloomberg School of Public Health research suggests.

The researchers found that [diabetes](#) appears to age the mind roughly five years faster beyond the normal effects of aging. For example, on average, a 60-year-old with diabetes experiences [cognitive decline](#) on par with a healthy 65-year-old aging normally. Decline in memory, word recall and executive function is strongly associated with progression to [dementia](#), a loss of mental capacity severe enough to interfere with a person's daily functioning.

A report on the research is published in the Dec. 2 issue of the journal *Annals of Internal Medicine*. The study is believed to be the longest of its kind following a cross-section of adults as they age.

"The lesson is that to have a healthy brain when you're 70, you need to eat right and exercise when you're 50," says study leader Elizabeth Selvin, PhD, MPH, an associate professor of epidemiology at the Johns Hopkins Bloomberg School of Public Health. "There is a substantial cognitive decline

associated with diabetes, pre-diabetes and poor glucose control in people with diabetes. And we know how to prevent or delay the diabetes associated with this decline."

For the study, Selvin and the team used data from the Atherosclerosis Risk in Communities Study (ARIC), which in 1987 began following a group of 15,792 middle-aged adults in communities in Maryland, North Carolina, Minnesota and Mississippi. Participants were seen at four visits approximately three years apart beginning between 1987 and 1989, and were seen a fifth time between 2011 and 2013. Cognitive function was evaluated at visits two (1990-1992), four (1996-1998) and at visit five.

The researchers compared the amount of cognitive decline associated with aging with the amount of decline found in the ARIC participants. They determined that there was 19 percent more decline than expected in those participants with poorly controlled diabetes, as well as smaller declines for those with controlled diabetes and pre-diabetes. The outcomes were the same whether the participants were white or black.

Selvin says the results underscore the importance of using a combination of weight control, exercise and a healthy diet to prevent diabetes. Even losing just five to 10 percent of body weight, she says, can keep someone from developing diabetes. Diabetes is a function of elevated sugar (glucose) levels in the blood. This excess glucose can damage tissues and the vascular system throughout the body and diabetes is associated with blindness, nerve damage in the extremities and kidney disease. While diabetes can often be controlled through medication, exercise and changes to diet, disease prevention is the preferred goal.

"If we can do a better job at preventing diabetes and controlling diabetes, we can prevent the progression to dementia for many people," Selvin

says. "Even delaying dementia by a few years could have a huge impact on the population, from quality of life to health care costs."

Nationwide, dementia costs in 2010 were estimated to be upwards of \$159 billion a year and, with the aging of the population, are expected to increase by nearly 80 percent by 2040.

Researchers are increasingly aware of the importance of many other causes of dementia besides Alzheimer's disease, particularly cognitive impairment linked to abnormalities in blood vessels in the brain.

"There are many ways we can reduce the impact of cerebral blood vessel disease—by prevention or control of diabetes and hypertension, reduction in smoking, increase in exercise and improvements in diet," says co-author A. Richey Sharrett, MD, DrPH, an adjunct professor at the Johns Hopkins Bloomberg School of Public Health. "Knowing that the risk for cognitive impairments begins with diabetes and other risk factors in mid-life can be a strong motivator for patients and their doctors to adopt and maintain long-term healthy practices."

Research has shown that the single best predictor of type 2 diabetes is being obese or overweight and, in the United States alone, more than one-third of adults (more than 72 million people) are obese, defined as having a Body Mass Index of 30 or more about 30 pounds overweight. Meanwhile, the diabetes epidemic has grown rapidly over the past several decades, affecting approximately 10 percent of American adults (21 million people).

More information: "Diabetes in midlife and cognitive change over 20 years: the Atherosclerosis Risk in Communities Neurocognitive Study," *Annals of Internal Medicine*, 2014.

Provided by Johns Hopkins University Bloomberg School of Public Health

APA citation: Diabetes in midlife linked to significant cognitive decline 20 years later (2014, December 1) retrieved 13 October 2022 from <https://medicalxpress.com/news/2014-12-diabetes-midlife-linked-significant-cognitive.html>

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