

New study singles out factors linked to cognitive deficits in type 2 diabetes

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Older adults with diabetes who have high blood pressure, walk slowly or lose their balance, or believe they're in bad health, are significantly more likely to have weaker memory and slower, more rigid cognitive processing than those without these problems, according to a new study published by the American Psychological Association.

These three health factors stood out from more than a dozen suspected to shape how [Type 2 diabetes](#) is frequently shadowed by cognitive impairment, including [dementia](#). An analysis in September's *Neuropsychology* stresses that although these factors might not actually cause cognitive problems, their presence can warn doctors that such problems may exist or soon develop.

"Awareness of the link between diabetes and cognition could help people realize how important it is to manage this disease--and to motivate them to do so," said co-author Roger Dixon, PhD, of the University of Alberta.

Type 2 diabetes has been found by other researchers to nearly double the risk of dementia and Alzheimer's disease, said Dixon, who studies how health affects cognition in aging. As diabetes becomes more common, this heightened risk could dramatically hike the number of older people with dementia - a double whammy of serious chronic disease. Among people older than 60, the U.S. prevalence of Type 2 diabetes is more than 23 percent, according to the National Institute of Diabetes and Digestive & Kidney Diseases. The Canadian prevalence is nearly 19

percent, according to the Public Health Agency of Canada.

An analysis of older Canadians living in British Columbia -- 41 with Type 2 diabetes (ages 55-81) and 458 matched healthy controls (ages 53-90) -- found that systolic [blood pressure](#) (the top number, or maximum pressure on artery walls during a single heartbeat), a low combination score for gait and balance, and a patient's own reports of poor health all played a statistically significant role in the relationship between diabetes and [cognitive impairment](#) relationship.

In other words, higher but still normal blood pressure, slower gait and shakier balance, and/or reporting one's self to be in bad health regardless of actual problems boosted the likelihood that someone with Type 2 diabetes had impaired cognition. The relationships were linear: For example, the worse the balance, the higher the likelihood of cognitive problems, as measured by mental speed (reaction time, switching time and perceptual speed), mental control and flexibility (executive functioning), and recall of recent learning (episodic memory).

The results highlight factors that may work indirectly, gradually and cumulatively to make older diabetics more likely to develop dementia. Researchers tested 13 different variables in all, in the areas of general fitness, emotional health, subjective and functional health, and lifestyle activities.

Mediating Factors

Because diabetes and hypertension often go together, Dixon said he was not surprised that high systolic blood pressure accounted for one-third to one-half of significantly worse scores on four tests. That finding, said the authors, suggests that diabetes and cognition may be connected via diabetics' vascular problems. For example, diabetes and hypertension may both play a role in a larger metabolic syndrome that includes high

blood sugar and insulin resistance.

However, the other two factors raised new questions. Combined gait and balance had the greatest influence, accounting for between 32 percent and 62 percent of performance on seven cognitive tests. Diabetes might affect the specific nerves that control gait and balance, the authors wrote, or more broadly affect the overlapping brain areas that support both gait-balance and cognition.

Like blood pressure, what people said about their health accounted for about one-third to one-half of performance on five different cognitive tests. Negativity about one's health could reflect related factors such as stress or depression, which did not, in this study, directly mediate between diabetes and cognition. Self-reported health is "an important indicator of ways in which a cluster of health-related beliefs and behaviors can modulate the effect of this disease on cognitive adaptation," Dixon said.

"It's important to pay attention to the health beliefs of older adults, not because they are necessarily accurate or valid indicators of specific health status, but because they might track overall health," Dixon said.

Type 2 diabetes in adults accounts for 90 percent to 95 percent of all diagnosed cases of diabetes, according to the National Institute of [Diabetes](#) and Digestive & Kidney Diseases.

More information: "Testing Covariates of Type 2 Diabetes-Cognition Associations in Older Adults: Moderating or Mediating Effects?" G. Peggy McFall, MSc, and Bonnie P. Geall, BSc, University of Alberta; Ashley L. Fischer, BSc, Simon Fraser University; Sanda Dolcos, PhD, and Roger A. Dixon, PhD, University of Alberta; *Neuropsychology*, Vol. 24, No. 5.

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