

Older age at onset of Type 1 diabetes associated with lower brain connectivity

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Children and adolescents older than age 8 at the onset of type 1 diabetes had weaker brain connectivity when tested later in life relative to those who had earlier ages of diagnosis, University of Pittsburgh Schools of the Health Sciences researchers discovered.

The findings, presented today at the American Psychosomatic Society's annual meeting, were made by analyzing the [brain](#) scans of 44 middle-age adults diagnosed with [type 1 diabetes](#) as children.

"Adolescence is a time when the brain matures and makes connections in networks responsible for different functions," said John Ryan, Ph.D., assistant professor of psychiatry at Pitt. "Further study is needed to determine if and how the onset of type 1 diabetes shortly before or during puberty affects [brain function](#) and how better control of the disease at that important time could yield changes in brain function later in life."

Half the study participants had onset of type 1 diabetes before age 8 and were matched with participants of the same sex and age who were diagnosed after age 8, but before age 17. All were enrolled in the Pittsburgh Epidemiology of Diabetes Complications Study, an ongoing investigation led by Pitt's Graduate School of Public Health to document long-term complications of type 1 diabetes among patients at Children's Hospital of Pittsburgh of UPMC between 1950 and 1980.

Type 1 diabetes is usually diagnosed in children and young adults and happens when the body does not produce insulin, a hormone that is needed to convert sugar into energy, and can lead to nerve and organ damage. With insulin therapy and other treatments, the condition can be controlled.

Dr. Ryan noted that his findings were a "snapshot" of scans and tests from one time point, and

repeated scans and tests over the next five to 10 years will be critical to determine if the weaker brain connectivity might be linked to cognitive function, and if any predictive markers could be found in the [brain scans](#) that might warn of future cognitive impairment.

"The fact that adults with type 1 diabetes are now living longer than ever is certainly a success of treatment advancements, but it also presents an urgent [public health](#) problem," said Caterina Rosano, M.D., M.P.H., senior author of this work and associate professor of epidemiology at Pitt Public Health. "A striking feature of these patients is that they develop [brain abnormalities](#) similar to those observed in much older adults without [diabetes](#). It is very possible that older age may amplify the progression of brain abnormalities and possibly lead to a faster cognitive decline than what would be observed because of age alone. We need to rapidly identify and prevent the characteristics of this accelerated brain aging in type 1 diabetics if we want to ensure the highest quality of life for these patients."

Provided by University of Pittsburgh Schools of the Health Sciences

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