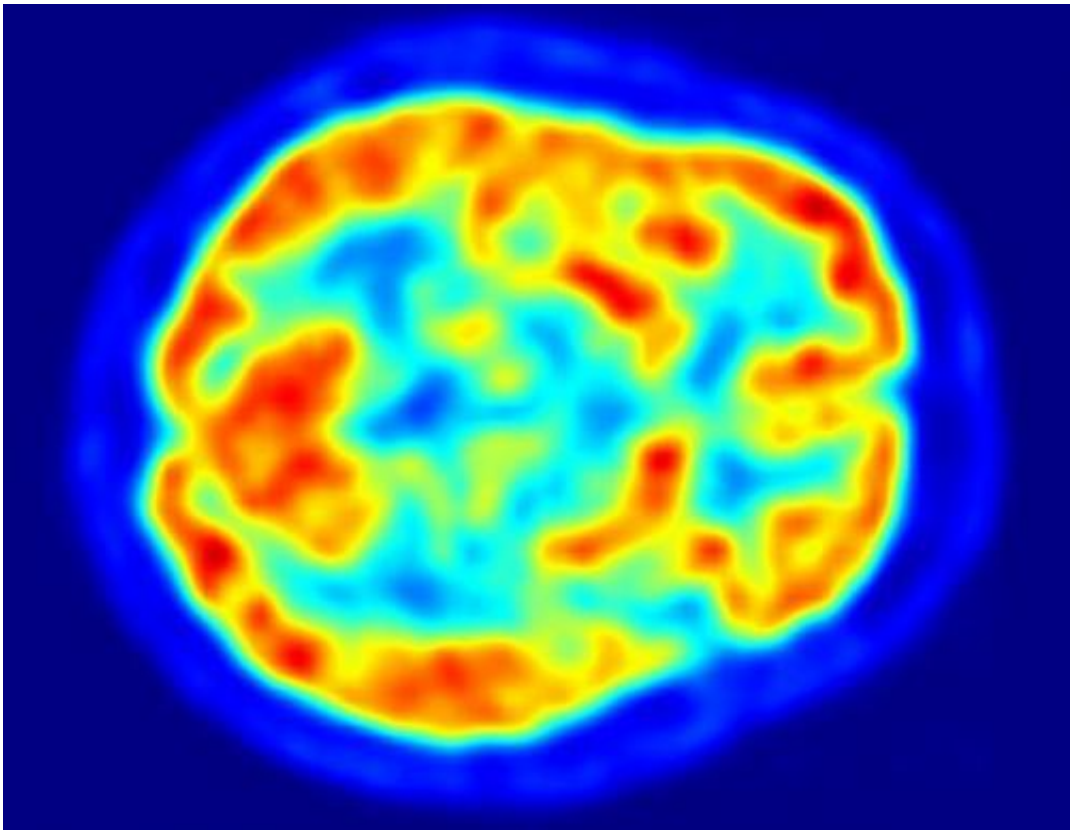
Research suggests link between elevated blood sugar, Alzheimer's risk

May 6 2013, by Alexis Blue



UA researchers studied brain images of 124 cognitively normal, non-diabetic adults with a family history of Alzheimer's disease.

(Medical Xpress)—A new University of Arizona study, published in the journal *Neurology*, suggests a possible link between elevated blood sugar levels and risk for developing Alzheimer's disease.

About 5 percent of men and women, ages 65 to 74, have Alzheimer's disease, and it is estimated that nearly half of those age 85 and older may have the disease, according to the U.S. Centers for Disease Control and Prevention. Among the known factors that contribute to the disease are age and genetics. Scientists also think that high blood pressure, high cholesterol and diabetes may increase risk.

Although the link between diabetes and Alzheimer's has been studied, UA researchers wondered if elevated blood sugar levels in non-diabetic individuals also might indicate a higher risk for developing Alzheimer's disease.

"There have been studies that have linked diabetes to Alzheimer's disease as a risk factor," said Alfred Kaszniak, UA professor of psychology and a co-author on the study. "What was not known when we began this work is whether that risk was only at levels of blood sugar that qualify for diagnoses of diabetes, or in the borderline or pre-diabetic range, or would we also see a relationship across the so-called normal range of blood glucose?"

The researchers used fluorodeoxyglucose (18F) positron electron tomography, or FDG PET, a medical imaging technique that produces three-dimensional images of metabolic activity in the brain. Fasting serum glucose levels – blood sugar levels following several hours of not eating – are routinely acquired as part of the FDG PET protocol.

"When compared to those without the disease, Alzheimer's disease patients demonstrate a pattern of reduced brain metabolism in particular brain regions," explained Christine Burns, lead author on the study and a UA pre-doctoral student in psychology. "What we show is an association between elevated fasting serum glucose levels and a similar pattern of reduced metabolism in these same AD-related brain regions in cognitively healthy adults."

The researchers studied data on 124 cognitively normal, non-diabetic adults with a family history of Alzheimer's disease. The individuals, who ranged in age from 47 to 68, were among participants in a larger study, led by Dr. Eric Reiman, executive director of the Banner Alzheimer's Institute in Phoenix, looking at a variety of Alzheimer's risk factors, including genetic risk.

The link between high blood sugar and reduced brain metabolism existed regardless of whether individuals carried the Apolipoprotein E4 gene variant, an established risk factor for the development of Alzheimer's disease.

In addition to suggesting a link between elevated blood sugar levels and Alzheimer's risk in non-diabetic individuals, the study also shows promise for the use of brain imaging techniques like PET in identifying Alzheimer's risk and developing early preventative interventions, researchers say.

"Right now, if you want to develop a drug or evaluate some other kind of a preventive measure for Alzheimer's disease, the labor and expense is prohibitive," Kaszniak said. "If you recruit people who may be at some risk, but are 20 years away from developing signs of the illness, what drug company or governmental agency is going to fund research that follows people for 20 years to see whether something is effective in prevention?

"However, if you have a biologic marker, it suggests what areas you should really focus on in those very expensive longitudinal studies," he said.

Burns said she hopes the findings will inform ongoing work designed to help develop early Alzheimer's interventions.

"A lot of valuable research is focused on treatment and slowing decline in Alzheimer's patients," she said. "I'm interested in complementing this work with interventions that can be implemented earlier on, perhaps at middle age."

More information: www.neurology.org/content/80/1 … bf-a3f2-0a4a2e9ae14d

Provided by University of Arizona