Insulin resistance may be associated with stroke risk

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Insulin resistance, a condition in which insulin produced by the body becomes less effective in reducing blood glucose levels, appears to be associated with an increased risk of stroke in individuals without diabetes, according to a report in the October issue of *Archives of Neurology*.

Insulin resistance originates from several factors, including genetics, a sedentary lifestyle and obesity, according to background information in the article. The condition contributes significantly to the risk of cardiovascular disease, but whether it predicts ischemic stroke (interruption in blood flow to the brain due to a blood clot or another artery blockage) is still a matter of debate.

One widely used tool to estimate insulin sensitivity is the homeostasis model assessment (HOMA), calculated using fasting blood glucose and fasting insulin levels. Tatjana Rundek, M.D., Ph.D., of Miller School of Medicine, University of Miami, and colleagues assessed insulin resistance using HOMA for 1,509 non-diabetic participants in the Northern Manhattan Study, a study assessing stroke risk, incidence and prognosis in a multi-ethnic urban community. Participants were followed for an average of 8.5 years.

During the follow-up period, vascular events occurred in 180 participants, including 46 who had fatal or non-fatal ischemic strokes, 45 who had fatal or non-fatal heart attacks and 121 who died of vascular causes. Individuals in the top one-fourth (quartile) of HOMA index had

an increased risk of stroke compared to those in the other three quartiles of the HOMA index. Adjusting for established cardiovascular risk factors—including glucose level, obesity and metabolic syndrome—did not diminish the association. The relationship between insulin resistance and the risk of first stroke was stronger in men than women but did not vary by racial or ethnic group.

Individuals in the top quarter of insulin resistance had a 45 percent greater risk of any type of vascular event. However, insulin resistance was not associated with heart attack or vascular death separately.

"There are several possible reasons for the stronger effect of insulin resistance on the risk of ischemic stroke than of myocardial infarction in the present study compared within other studies," the authors write. It may be because individuals with a history of heart attack were excluded from this study, or because factors associated with insulin resistance—including high blood pressure, high triglyceride levels and low HDL or "good" cholesterol levels—are more significant risk factors for stroke than for heart attack.

"These findings emphasize the need to better characterize individuals at increased risk for ischemic stroke and the potential role of primary preventive therapies targeted at insulin resistance," the authors conclude.

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