

Smoking significantly increases risk of aneurysm in people with certain genes

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For people who carry common gene variants, cigarette smoking greatly increases the risk that a blood vessel in the brain will weaken and balloon out - called an aneurysm - which could be life-threatening if it ruptures, according to research presented at the American Stroke Association's International Stroke Conference 2010.

Researchers reported on two new studies from the Familial Intracranial Aneurysm (FIA) project, a multinational collaboration funded by the National Institutes of Neurological Disorders and Stroke to study genetic and other risk factors in families with at least two members affected by intracranial aneurysm.

In one study (Broderick, abstract 156), researchers found that the chance of an intracranial aneurysm increased between 37 percent and 48 percent for people who carried one copy of an identified risky gene variation. However, when the gene variant was combined with smoking the equivalent of one pack a day for 20 years, the risk increased more than five-fold. People with two copies of the gene variant were at even higher risk.

"Like putting a match to kindling, smoking greatly increases the likelihood of a ruptured aneurysm in people with a [genetic susceptibility](#)," said Joseph P. Broderick, M.D., study author and professor and chair of the neurology department at the University of Cincinnati Neuroscience Institute.

Cigarette smoking is the leading environmental cause of intracranial aneurysm. An estimated 70 percent to 80 percent of people who experience aneurysms are current or former smokers, he said. In the study, 82.5 percent of participants were smokers at some point. Intracranial aneurysms also occur in multiple members of certain susceptible families.

A ruptured intracranial aneurysm can create a subarachnoid hemorrhage. When that occurs, 40 percent of patients die, and most others experience major disability from the [brain injury](#) caused by the rapid bleeding.

By comparing the frequency in 406 patients from the FIA families with that of 392 control subjects without aneurysm in the Cincinnati area, researchers confirmed that certain gene variants on chromosomes 8 and 9 raise the risk of intracranial aneurysm. Other variants on chromosome 2, suggested as genetic risks in a prior study on other populations, were not found to be risk factors in this study.

In the study about 22 percent of controls had a least one copy of the [gene variant](#) on chromosome 8 and 73 percent had at least one copy of the variant for chromosome 9. Broderick noted that this percentage is about what is expected in the general population - at least among whites in this region.

"These results tell us the approximate location of the risk-inducing gene on the chromosomes but does not identify the exact gene or how its functioning contributes to the risk of aneurysm," said Broderick, principal investigator of the FIA project.

"This is a powerful message to family members of people who have had ruptured aneurysms. Even if you have the gene, you can dramatically affect your risk by not smoking. If you smoke, you are multiplying the

effect of the gene," he said.

Broderick noted that since it is too early to recommend genetic testing, all family members of people who have had an intracranial aneurysm should stop smoking.

In a second presentation from the FIA study, (Sauerbeck, abstract 156), researchers reported that the primary causes of death in FIA families are cancer and cardiac problems other than aneurysm. In an average 3.27 years follow-up of 1,073 people with a diagnosis of intracranial aneurysm and 1,721 family members undiagnosed with an intracranial aneurysm at enrollment in the study, none of those without aneurysm at study onset died from a ruptured intracranial aneurysm. In addition, most deaths in those with aneurysm were unrelated to their aneurysms.

"Especially for those diagnosed with an unruptured aneurysm, if the condition is treated or medically monitored to make sure it's not growing, you can modify your risk factors — by not smoking and keeping blood pressure under control — and not worry as much about the risk of rupture," said Laura

Provided by American Heart Association

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