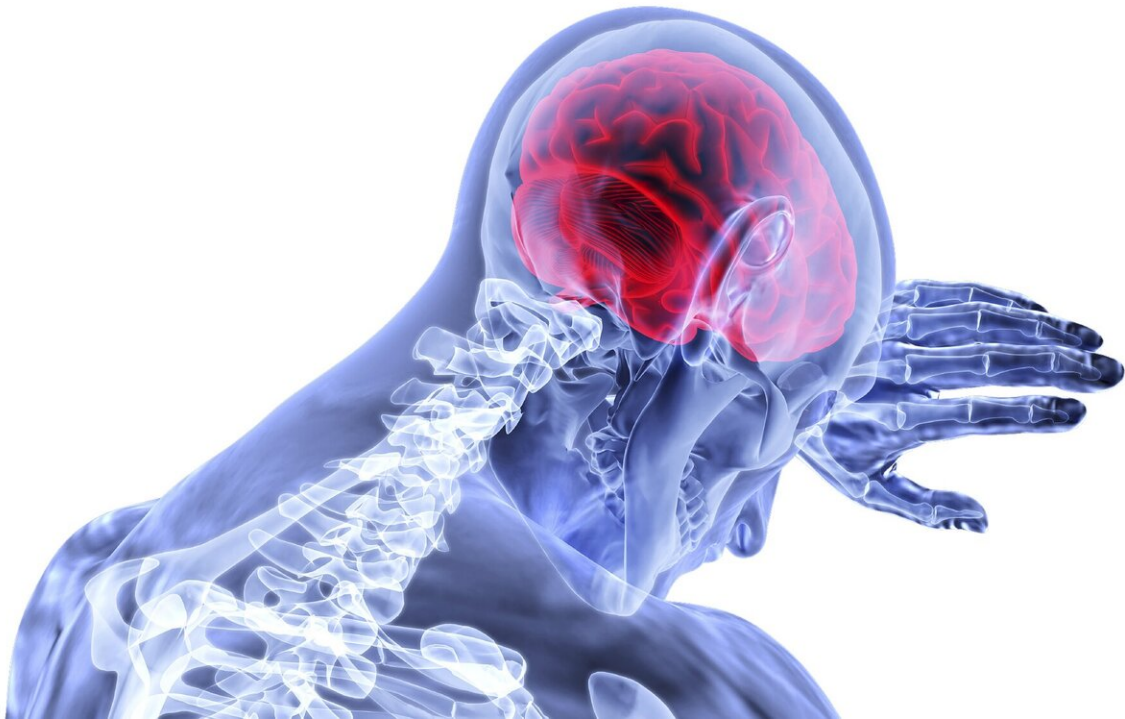


Study finds 10 metabolites associated with risk of stroke

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Metabolites are small molecules found in our body's cells. They come from the food we eat, chemical processes happening within our bodies and microbes. A new analysis of recent studies has found that the levels of 10 metabolites detected in the blood are associated with a person's risk of stroke. The research is published in the December 2, 2020, online

issue of *Neurology*, the medical journal of the American Academy of Neurology.

Metabolism is the chemical reactions that occur within cells that convert food into energy. That energy helps maintain cellular processes. Metabolites are products of a cell's regulatory process. They include lipids, fatty acids, amino acids and carbohydrates. Levels of these [small molecules](#) can change in response to various factors like disease, genetics or the environment, and can be indicators of cell health, cardiovascular health and even overall health.

"With stroke being a leading cause of death and serious long-term disability worldwide, researchers are looking for new ways to identify [high-risk patients](#), determine the causes of stroke and develop prevention strategies," said study author Dina Vojinovic, Ph.D., of Erasmus University Medical Center in Rotterdam, the Netherlands. "For our analysis, we examined a large series of metabolites to gain new insights into the metabolic changes that may happen leading up to a stroke."

For the meta-analysis, researchers pooled the data of seven studies and identified 38,797 people who did not have stroke at the start of the study. Participants provided health histories, had medical exams and gave [blood samples](#). Blood samples were analyzed with nuclear magnetic resonance technology, which uses magnetic fields, to examine the levels of 147 metabolites. Researchers then determined how many people had a stroke from two years later to up to 15 years later, depending on the study.

A total of 1,791 people had a stroke during the follow-up period. Researchers found 10 metabolites were associated with risk of stroke.

The strongest association was found with the amino acid histidine. Histidine comes from protein sources like meat, eggs, dairy and grains.

It is an essential amino acid that helps maintain life. Researchers found histidine was associated with a lower risk of ischemic stroke, a stroke caused by a blockage in a blood vessel, such as a blood clot.

"Histidine can be converted to histamine, which has been shown to have a strong effect on the dilation of the [blood](#) vessels," said Vojinovic. "It also functions as a neurotransmitter in the brain and has been shown in some studies to reduce [blood pressure](#) and inflammation, so this finding is not surprising."

With every one standard deviation increase in levels of histidine, people had a 10% lower risk of stroke. These were not explained by other factors that could affect risk of stroke, such as [high blood pressure](#), diabetes, smoking and body mass index.

Researchers also found the high-density lipoprotein cholesterols, HDL and HDL2, considered good cholesterols, were associated with a lower risk of ischemic stroke. People can improve their levels of good cholesterol by getting more exercise, losing weight and replacing bad fats with healthier fats from foods like fish, nuts, olives and avocados.

Low-density lipoprotein cholesterols, or bad cholesterols, as well as triglycerides were associated with a higher risk of stroke.

A [metabolite](#) called pyruvate, which is produced when cells break down glucose, increased a person's risk of stroke. With every one standard deviation increase in levels of pyruvate, people had a 13% higher risk of ischemic stroke.

"Pyruvate is critical for supplying energy to a cell and has been shown in previous studies to decrease inflammation, while in contrast, to also increase a person's risk for cardiovascular disease, so more research is needed," said Vojinovic. "Our analysis provides new insights into how

the risk of stroke may be affected on the molecular level. It also raises new questions. Future studies are needed to further research the biological mechanisms underlying these associations between metabolites and risk of stroke."

A limitation of the study was the small number of participants who had hemorrhagic stroke, reducing researchers' abilities to detect associations for this [stroke](#) type.

Provided by American Academy of Neurology

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