

Study finds your genes may raise your heart attack risk during high-stress times

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People with specific genetic traits and those who have anxiety or depression have a significantly higher heart attack risk during periods of social or political stress than at other times, according to a new study being presented at the [American College of Cardiology's Annual Scientific Session](#). Researchers said the findings suggest opportunities to identify those at elevated risk and perhaps even prevent cardiac events.

Doctors have long noticed that heart attacks tend to spike around certain times, such as the winter holidays, but the reasons for this are not well understood. Less reported are any trends in heart attacks or other [cardiac events](#) around major elections and sporting events.

This study is the first to examine the [genetic basis](#) for stress sensitivity as a potential driver behind acute coronary syndromes (ACS), which include heart attacks and other serious conditions where the heart is suddenly deprived of blood supply.

The results showed that people with high genetic stress sensitivity had a higher risk of ACS during stressful periods and that risk was more than tripled among people who also had anxiety or depression.

"We found people who are genetically predisposed to stress tend to have a strikingly higher probability of developing a [heart attack](#) after these stressful events," said Shady Abohashem, MD, instructor of cardiovascular imaging in the Cardiology Department and Cardiovascular Imaging Research Center at Massachusetts General Hospital and Harvard Medical School and the lead study author.

"With this study, we have identified a new factor that could be incorporated into screening to identify people who are at increased risk. This could also help shape prevention strategies and help us see how we

might be able to intervene."

The research is based on data from 18,428 people who provided health information and blood samples to the Mass General Brigham Biobank, a research program of the Mass General Brigham health system. All participants' records included a neuroticism [polygenic risk score](#) (nPRS), a well-established metric that reflects a person's genetic predisposition to stress.

The researchers analyzed nPRS scores among people who experienced ACS events during periods of sociopolitical stress, those who experienced ACS events during control periods and those who did not experience ACS.

For the study, periods considered to have high levels of social or political stress included 10 days after Christmas each year, the five days after each presidential election and the five days after major sporting events (such as Super Bowls and NBA playoffs) involving Boston-area teams. For controls, researchers compared these high-stress periods with other days of the year.

According to the results, 1,890 study participants experienced ACS over the 20-year study period between 2000 and 2020. People with above median nPRS scores were 34% more likely to experience ACS during stressful periods than during control periods, even after the researchers accounted for traditional cardiovascular risk factors, such as age, sex, smoking and diabetes and health behaviors such as alcohol consumption.

People with higher nPRS scores were also more likely to experience anxiety and depression. The researchers found that having anxiety or depression accounted for nearly one-quarter of the linkage between nPRS score and stress-triggered ACS. People with above median nPRS who also developed anxiety or depression were 3.2 times more likely to

experience ACS after stressful events than during control periods.

Although nPRS is not widely used for cardiovascular risk screening or psychiatric assessments in clinical practice currently, the findings suggest that broader use of this genetic test in the future could help doctors identify people with elevated risk, researchers said. Even if genetic screening is not feasible, Abohashem said that screening for anxiety and depression is feasible in most clinics and can help to identify those at higher risk.

"We now understand that there are certain factors driving this increase in heart attacks in those who are at increased risk," Abohashem said. "We could potentially target those people with screenings and dual-benefit interventions, such as exercise, yoga, mindfulness or other approaches that are associated with reductions in anxiety and depression and also with lowering cardiovascular risk."

Abohashem said that people in many areas of the U.S. face challenges accessing mental health support due to provider shortages and other barriers, although telehealth has expanded access to some degree. Primary care physicians may also be able to help increase awareness and steer patients toward lifestyle modifications such as exercise and sleep hygiene that can help reduce stress, Abohashem said.

Since the study is a retrospective analysis, it cannot definitively show a causal relationship between anxiety and depression and elevated risk of ACS. Researchers said that prospective diverse studies could help to further explain this relationship.

More information: Abohashem will present the study, "Genetic Susceptibility to Stress Syndromes Heightens the Risk of Acute Coronary Syndrome Triggered by Socio-Political Stress," on Monday, April 8, 2024.

Provided by American College of Cardiology

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