

Self-perceived stress linked to cryptogenic ischemic stroke in young women

Add topic to email alerts

Key takeaways:

Greater self-perceived stress was linked to early-onset cryptogenic ischemic stroke regardless of traditional stroke risk factors.

In a sex-specific analysis, this association was seen among women but not men.

Self-perceived stress among young women was significantly associated with increased risk for early-onset cryptogenic ischemic stroke, even after adjustment for traditional risk factors, according to a study published in *Neurology*.

The prevalence of early-onset ischemic stroke has increased recently among young people, but researchers cannot fully explain this trend using traditional vascular risk factors. Some evidence suggests that habitual risk factors, such as stress, may play a role.

Psych0325Kutal_Graphic_01

Data were derived from Kutal S, et al. *Neurology*. 2025;doi:10.1212/WNL.0000000000213369.

“Younger people often experience stress due to the demands and pressures associated with work, including long hours and job insecurity, as well as financial burdens,” Nicolas Martinez-Majander, MD, PhD, neurologist in the Stroke Unit and Research Center of Helsinki University Hospital and docent/adjunct professor in the department of neurology at University of Helsinki in Finland, said in a related press release.

Link between stress, stroke

This motivated the researchers to investigate the link between self-perceived stress and early-onset cryptogenic ischemic stroke (CIS) in an observational case-control study of 426 participants (median age, 41 years; interquartile range, 34–46 years; 47.7% women) aged 18 to 49 years with first-ever CIS and 426 age- and sex-matched stroke-free controls who were recruited from 19 European centers from November 2013 to November 2022.

The researchers measured self-perceived stress among all participants using an altered version of the Perceived Stress Scale (PSS), with participants categorized into three groups: low stress (0–13), moderate stress (14–26) and high stress (27–40).

Researchers also used medical records and interviews to gather clinical information on

traditional stroke risk factors, such as hypertension, cardiovascular diseases, diabetes, heavy alcohol consumption, current smoking, obesity, diet, depression, physical inactivity and migraine with aura (MA).

Overall, low level of education and traditional stroke risk factors were more common in the CIS group. Further, participants with CIS were more likely to view themselves as stressed vs. controls (at least moderate stress: 46.2% vs. 33.3%; $P < .001$), although stress level did not appear linked to severity of stroke.

After adjustment for age, level of education, predefined vascular risk factors and MA, the researchers found that greater self-perceived stress was independently associated with CIS across the study population (adjusted OR per PSS point increase = 1.04; 95% CI, 1.01-1.07).

However, in the analysis based on PSS categories, only moderate stress (OR = 1.47; 95% CI, 1-2.14) was independently associated with CIS.

Further, sex-specific analyses adjusted for age and level of education showed that, among women, moderate (OR = 1.78; 95% CI, 1.07–2.96) and high (OR = 1.06; 95% CI, 1.02–1.11) perceived stress were linked to increased risk for CIS, with no similar findings among men. Sensitivity analyses supported these findings.

Finally, the researchers found that higher stress was only significantly associated with CIS among patients aged 18 to 39 years (OR = 1.06; 95% CI, 1–1.11), according to a fully adjusted age-stratified model.

The researchers noted several limitations to the study, including potential selection bias of participants with milder strokes and potential recall bias, as participants with CIS were asked to evaluate pre-stroke stress after stroke.

“More research is needed to understand why women who feel stressed, but not men, may have a higher risk of stroke,” Martinez-Majander said in the release. “In addition, we need to further explore why the risk of stroke in women was higher for moderate stress than high stress. Knowing more about how stress plays a role could help us to create better ways to prevent these strokes.”

Amygdala's role

In a related editorial, Philip B. Gorelick, MD, MPH, and Farzaneh A. Sorond, MD, PhD, both of Northwestern University Feinberg School of Medicine, discussed the potential biological link between stress and stroke.

“Existing data suggest that the amygdala, the brain’s hypothetical emotional relay station, may play a critical role in the mechanistic pathways underpinning the stress responses that lead to stroke and cardiovascular diseases,” they wrote.

For example, by analyzing the activity of the amygdala, researchers have been able to predict the development of cardiovascular disease among patients independent of cardiovascular risks.

“These data add the neural-hematopoietic-arterial axis to the chain of brain-body interactions underlying the systemic stress response,” they wrote.

References:

Gorelick PB, et al. *Neurology*. 2025;doi:10.1212/WNL.0000000000213398.

Stressed out? It may increase the risk of stroke.

<https://www.aan.com/PressRoom/Home/PressRelease/5243>. Published Mar. 5, 2025. Accessed Mar. 5, 2025.