See related article, p 367.

Sometimes we have to look at the obvious. Modifiable risk factors for stroke have been identified and their control has been proven to be effective. Although frequent risk factors, such as hypertension, heart disease, and diabetes mellitus, contribute strongly to stroke incidence, they do not explain all incident cases. Therefore, the search of new risk factors is ongoing. To many physicians and patients, it is obvious that stressful life events play a role, especially, when they become a chronic and heavy burden in private life, for instance a severe disease occurring in a close relative or the sudden loss of a next-of-kin, and also changes in professional life can play a role, such as career disappointments or loss of job. It is quite obvious that such events are potentially harmful and change the outlook of everyone affected by them. Although some persons may adapt themselves more easily to such changes, others develop adjustment disorders and this burden develops a distressing quality, which increases the risk of suffering a stroke.

Such factors causing psychosocial distress have been correlated with major depression, type A behavior, stressful life events, unemployment, caregiver strain, racial disparities, loss of income, and living in impoverished areas. A positive association was found for high levels of neighborhood cohesions in 1 study. In most studies, psycho–physical stress is considered chronic when the psychological or physical response to stressors persist for at least 6 months.

This stress can either produce neurovegetative effects that predispose to psychosomatic diseases or such stress can directly relate to an increase of cerebrovascular disease risk by increasing excessive sympatheticimetic activity. Although its role as a risk factor for stroke seems plausible, the mechanism by which psychosocial stress affects the vascular system, such as the cerebral vascular endothelium, coagulation, or heart rhythm, has not yet been established.

Because of variability and overlap, it is also not clear which life-event factors mostly result in psychosocial stress (or distress) and therefore measurement becomes difficult and varies largely among studies. The Holmes and Rahe Questionnaire is among the most frequently used scores. It attributes to a varying list of life events, a specific number of life change units that apply to events in the past year of an individual life, and this results in a final score that gives an estimate of how stress affects health. These events are low-value events, such as minor violation of the law, change in number of family reunions, social or church activities, and go up to events with a high score, such as death of a spouse, divorce, marital separation, or imprisonment.

In this article, Riley et al report a study on psychosocial distress in a cohort of elderly risk persons from the Chicago Health and Aging Project. Psychosocial distress was defined as a composite measure of depression, self-perceived stress, neuroticism, and dissatisfaction. In the second cycle (1997–1999) of interviews (the first one was between 1993 and 1996), 4120 community dwelling persons were reached. They had a mean age of 77.1 years (61.4% black and 61.8% women). One hundred and fifty-one stroke deaths were identified, and further 452 incident stroke cases had at least 1 hospitalization for a stroke event (408 ischemic and 44 hemorrhagic) between 1997 and 1999.

Those in the most distressed group were older, more likely to be female and black, less educated, less physically active, reported a higher prevalence of most chronic health conditions, and more frequent use of antidepressants. When adjusting for age, race, and sex, each 1-SD higher-distress score related to a 47% greater risk of dying from stroke (hazard ratio, 1.47; 95% confidence interval, 1.28–1.70; $P<0.0001$). Also a graded response was shown between quartiles separating differing expressions of distress among the cohort, which is a strong criterion for causality. Participants in the highest quartile had nearly 3 times and those in the third quartile nearly a 2-fold higher risk of dying from stroke compared with those with the lowest-distress score. For stroke incidence, a 18% greater risk was found during the follow-up (hazard ratio, 1.18; 95% confidence interval, 1.07–1.30; $P<0.001$) but this difference did not show up differently when adjusting for education, stroke-risk factors, chronic conditions, and medication usage. When analyzed according to stroke type, a robust association of distress and stroke was found only for hemorrhagic stroke. Each 1-SD increase in distress was associated with a 72% (hazard ratio, 1.72; 95% confidence interval, 1.32–2.24; $P<0.0001$) increased risk of hemorrhagic stroke.

Why was there only a significant relation between distress and hemorrhagic stroke but not for ischemic stroke in this study? It might be surmised that hypertensive persons in chronic distress tend to neglect their blood pressure medications and thus have ineffective blood pressure control. Given the eminent role of antihypertensive drugs in hemorrhagic stroke prevention, this might account for this preponderance. Unfortunately, no data on blood pressure measurements are reported.

In sum, these findings are important and quite relevant for stroke care. In view of so many other studies pointing in the same direction, it must be assumed that psychosocial stress...
(causing distress) does play an important and frequent role for increasing the likelihood of suffering a stroke, especially, in persons that already have vascular risk factors. Although occurrence and frequency of psychosocial distress are rather well established, the pathophysiology of its effects to the brain has to be further studied and the methods of measuring its expression among persons bearing a high-stroke risk still have to be validated. In view of its high prevalence, effective methods and techniques of preventing psychosocial distress also have to be explored and tested in a larger cohort of stroke-risk persons.

**Disclosures**

None.

**References**


Psychosocial Distress, an Underinvestigated Risk Factor for Stroke
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