

Long-term survival decreased in young adults after stroke or transient ischemic attack

Marini C, Totaro R, Carolei A, for the National Research Council Study Group on Stroke in the Young. Long-term prognosis of cerebral ischemia in young adults. *Stroke*. 1999 Nov;30:2320-5.

QUESTION

What is the long-term prognosis for young adults (< 45 y) who have had a first-ever cerebral ischemic event (stroke or transient ischemic attack [TIA])?

DESIGN

Inception cohort with mean follow-up of 96 months.

SETTING

7 departments of neurology in Italy.

PATIENTS

330 patients who were hospitalized with a first-ever stroke (*n* = 190) or TIA (*n* = 140). Age range was 15 to 44 years.

ASSESSMENT OF PROGNOSTIC FACTORS

Cause of stroke, sex, age, stroke or TIA at entry, carotid territory involvement, cardiac disease, carotid abnormalities, hypertension, and diabetes mellitus.

MAIN OUTCOME MEASURES

A combined end point of nonfatal stroke, nonfatal myocardial infarction, and all-cause mortality. All-cause mortality alone was also assessed.

MAIN RESULTS

During follow-up, 26 patients (8%) died, 10 (3%) had a new stroke, and 8 (3%) had a myocardial infarction. By the end of follow-up, 49 of the patients who were alive (16%) were still dependent, and 169 patients (56%) had returned to work. After adjusting for age and sex by using data from the general Italian population, survival was less than expected for all study participants (91% vs 99%, *P* < 0.001). Mortality was highest in the first year after stroke. Patients with stroke at entry had a lower survival rate than patients with TIA (87% vs 97%, *P* < 0.001). Multivariate analysis showed that the combined end point (nonfatal myocardial infarction and stroke and all-cause mortality) was associated with male sex, age > 35 years, presence

of cardiac disease, and stroke at entry (Table). All-cause mortality was associated with the presence of cardiac disease and stroke at entry (Table).

CONCLUSIONS

Young adults with cerebral ischemia had decreased long-term survival and increased morbidity. Stroke at entry and presence of cardiac disease were associated with decreased survival, nonfatal myocardial infarction, and nonfatal stroke.

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Outcome predictors and hazard ratios (HRs) for combined end point (nonfatal myocardial infarction and stroke and all-cause mortality) and for all-cause mortality alone in young adults with first-ever stroke or transient ischemic attack

Outcome predictors	Combined end point HR (95% CI)	All-cause mortality HR (CI)
Cardiac disease present	2.5 (1.3 to 4.8)	3.7 (1.6 to 8.6)
Stroke at entry	2.3 (1.0 to 5.0)	3.3 (1.1 to 9.7)
Age > 35 y	4.3 (1.5 to 12.5)	2.5 (0.8 to 7.8)*
Male sex	2.1 (1.0 to 4.4)	2.1 (0.9 to 5.1)*

*Not significant.

COMMENTARY

The interesting study by Marini and colleagues examines the prognosis of cerebral ischemia in younger adults. They have clearly defined their inception cohort and managed a prolonged and largely complete follow-up. The selection of patients could be criticized because it was limited to the neurology departments of large hospitals and could have missed patients who were not referred to the hospital, including those who died quickly. However, these omissions are likely to be few given the young age of this patient population. Another weakness is that the analysis did not include several established prognostic indicators, such as disability before stroke, initial consciousness level, severity of hemiparesis, proprioceptive loss, or the presence of urinary incontinence.

How do these results compare with previous studies, such as those presented by Warlow and colleagues (1) in an older population? The results of these studies and the one by Marini and colleagues confirm that the prognosis is better for younger patients with stroke, but their

outlook is still worse than age-matched peers who had not had a stroke or TIA. The adverse prognostic factors of older age, coexisting cardiac disease, and index stroke as opposed to TIA correlate for the most part with results from studies of older patients. Nonetheless, this additional knowledge about the prognosis for young patients with stroke or TIA is useful and confirms that secondary prevention for both cardiovascular and cerebrovascular events must be taken seriously. For example, the very low rates of quitting cigarette smoking (23 of 117) after a stroke or TIA is worthy of future clinical and research effort.

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Reference

1. Warlow CP, Dennis M, van Gijn J, et al. *Stroke: A Practical Guide to Management*. Oxford: Blackwell Scientific; 1996.