

Predictors of poor outcome in acute stroke included dependence before stroke, severe hemiparesis, and recurrent stroke

Hankey GJ, Jamrozik K, Broadhurst RJ, Forbes S, Anderson CS. Long-term disability after first-ever stroke and related prognostic factors in the Perth Community Stroke Study, 1989-1990. *Stroke*. 2002 Apr;33:1034-40.

QUESTION

In patients who have acute first-ever stroke and survive 30 days, what factors predict death and disability at 5 years?

DESIGN

Inception cohort followed for 5 years.

SETTING

Perth, Western Australia, Australia.

PATIENTS

370 patients who had a first-ever stroke (World Health Organization definition of stroke). 98% of patients (mean age 73 y, 54% men) were assessed for mortality and institutionalization at 5 years.

ASSESSMENT OF PROGNOSTIC FACTORS

Patients were assessed for 26 variables at baseline, including risk factors for cerebrovascular disease; associated illnesses; smoking status; level of consciousness; presence of urinary incontinence, cardiac failure, or atrial fibrillation; severity of limb paresis; and physical disability (Barthel Index of Activities of Daily Living). During follow-up, patients were assessed for recurrent vascular events, major illnesses, and medications.

MAIN OUTCOME MEASURES

Death, institutionalization, and disability (modified Rankin Scale score ≥ 3) at 5 years.

MAIN RESULTS

277 patients (77%) survived to 30 days after stroke. By 5 years, 125 patients had died. Among the patients who survived ≥ 30 days, the cumulative risks at 5 years were 14.4% for new institutionalization, 36% for new disability, and 54% for death or new institutionalization. Predictors of death or new institutionalization at 5 years were age, dependence (Barthel Index score < 20) before stroke, smoking status, history of intermittent claudication, severe hemiparesis, urinary incontinence, and recurrent stroke during follow-up (Table). Predictors of death or disability were age, moderate or severe hemiparesis, baseline disability, and recurrent stroke (Table).

CONCLUSIONS

In patients who have acute first-ever stroke and survive 30 days, about one half of patients survived 5 years and 14% were institutionalized. Predictors of poor outcome included dependence before stroke, severe hemiparesis, and recurrent stroke.

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Predictors of poor outcome at 5 years in 30-day survivors of acute first-ever stroke

Predictors	Odds ratio (OR) for death or institutionalization (95% CI)	OR (CI) for death or disability
Age	1.002 (1.001 to 1.004)	1.002 (1.001 to 1.004)
Dependence (Barthel Index score < 20) before stroke	5.4 (1.6 to 18)	Not significant
Smoking 1 to 20 cigarettes/d at baseline	4.2 (1.5 to 11.6)	Not significant
Baseline history of intermittent claudication	3.3 (1.2 to 8.6)	Not significant
Severe hemiparesis at baseline	5.9 (1.5 to 22.8)	4.5 (1.1 to 19)
Moderate hemiparesis at baseline	Not significant	2.7 (1.1 to 6.2)
Urinary incontinence at baseline	2.4 (1.01 to 5.7)	Not significant
Recurrent stroke during follow-up	4.8 (1.9 to 11.7)	9.4 (3.0 to 30)
Baseline disability (Barthel Index score < 20)	Not significant	6.3 (2.7 to 14)

COMMENTARY

The accurate prediction of outcome has been an important objective of stroke research. However, relatively few studies have focused on long-term outcome (> 1 y after stroke). The study by Hankey and colleagues provides an important addition to this information. The study is of high quality; they used a robust inception cohort, included a large number of cases, and had relatively complete follow-up using standardized outcome assessments.

The findings largely confirm what might have been anticipated from other stroke outcome studies (1). The key factors predicting long-term functional outcome relate to prestroke functioning (disability), severity of the index stroke (as indicated by hemiparesis, incontinence, and Barthel Index score), and risk for recurrent vascular disease (in particular, recurrent stroke).

The relatively modest effect of stroke severity on outcome probably reflects the selection of patients at 30 days, when early deaths would have removed many patients with the most severe initial insult.

If we are aiming to improve long-term outcomes after first-ever stroke, what are the lessons for research and clinical practice gained from this study? At present, we have only limited influence on pre-stroke function and severity of the index stroke. However, we have an increasing array of options for reducing the risk for recurrent vascular disease (2). A key message is that evidence-based secondary prevention strategies must be implemented in an effective and comprehensive way.

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