A simple risk score predicted 7-day stroke risk after transient ischemic attack

Rothwell PM, Giles MF, Flossmann E, et al. **A simple score (ABCD) to identify individuals at high early risk of stroke after transient ischaemic attack.** Lancet. 2005;366:29-36.

Clinical impact ratings: Emergency Med ★★★★★★☆ GIM/FP/GP ★★★★★★★ Hospitalists ★★★★★★★ Neurology ★★★★★★☆

QUESTION

Can a simple risk score predict stroke during the first 7 days after probable or definite transient ischemic attack (TIA)?

METHODS

Design: 3 cohort studies: a derivation cohort (Oxfordshire Community Stroke Project [OCSP]) and 2 independent validation cohorts (2 cohorts from the Oxford Vascular Study [OXVASC] and a cohort of patients referred to a weekly hospital-based TIA clinic).

Setting: 10 family practices in Oxfordshire, England (OCSP and OXVASC cohorts), and a hospital-based TIA clinic.

Patients: 209 patients (mean age 70 y) with a first-ever probable or definite TIA (OCSP derivation cohort); 190 patients (mean age 74 y) with probable or definite TIA and 378 patients (mean age 70 y) with suspected TIA (OXVASC validation cohorts); and 210 patients (mean age 65 y) referred to the hospital clinic with suspected TIA (clinic validation cohort).

Description of prediction guide: Analysis of predefined risk factors in the derivation cohort found that age ≥ 60 years, clinical features, symptom duration, and elevated blood pressure (BP) at presentation were predictive of stroke ($P \leq 0.1$); diabetes and previous diagnosis of hypertension were not. The resulting risk score, termed the ABCD (age, BP, clinical features, and duration) score, therefore included age (≥ 60 y = 1), BP (> 140 mm Hg systolic or ≥ 90 mm Hg diastolic = 1), clinical features (unilateral weakness = 2, speech disturbance without weakness = 1, other = 0), and duration of symptoms (≥ 60 min = 2, 10 to 59 min = 1, < 10 min = 0).

Outcomes: 7-day risk for stroke.

MAIN RESULTS

7-day stroke risk was 8.6% in the OSCP cohort, 10.5% in the OXVASC (probable or definite TIA) cohort, 5.3% in the OXVASC (suspected TIA) cohort, and 6.7% in the clinic (suspected TIA) cohort. The distributions of ABCD scores in the 2 OXVASC and the clinic validation cohorts are in the Table. The areas under the receiver-operating characteristic curve were 0.85 (95% CI 0.78 to 0.91) in the OXVASC (probable or definite TIA) cohort, 0.91 (CI 0.86 to 0.95) in the OXVASC (suspected TIA) cohort, and 0.80 (0.72 to 0.89) in the clinic (suspected TIA) cohort. The scores in the latter 2 cohorts remained predictive when strokes that occurred before patients sought medical attention were excluded ($P \leq 0.01$).

CONCLUSION

In patients with transient ischemic attack, a simple risk score based on age, blood pressure, clinical features, and duration of symptoms predicted 7-day stroke risk.

Sources of funding: UK Stroke Association; BUPA Foundation; UK Medical Research Council.

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7-day stroke risk by ABCD scores in OXVASC and clinic validation cohorts*

ABCD score	OXVASC cohort (188 patients with probable or definite TIA)		OXVASC cohort (375 patients with suspected TIA)		TIA clinic cohort (206 patients with suspected TIA)	
	Patients with score	7-d stroke risk (95% CI)	Patients with score	7-d stroke risk (CI)	Patients with score	7-d stroke risk (CI)
≤ 1	1%	0	7%	0	9%	0
2	15%	0	20%	0	18%	0
3	17%	0	22%	0	20%	0
4	24%	2.2% (0 to 6.4)	24%	1.1% (0 to 3.3)	26%	9.1% (1.5 to 17)
5	26%	16% (6 to 27)	18%	12% (4.2 to 20)	16%	12% (0.9 to 23)
6	16%	36% (19 to 52)	9%	31% (16 to 47)	11%	24% (5.6 to 42)

*OXVASC = Oxford Vascular Study; TIA = transient ischemic attack. CI defined in Glossary.

COMMENTARY

Recent studies indicate that the short-term risk for stroke after TIA is higher than is generally appreciated, with an overall risk of about 5% within 48 hours and 8% within 7 days (1, 2). This narrow time window provides a potential opportunity for stroke prevention. Assuming that these statistics are correct, acute TIA can be considered a medical emergency. The decision to admit or not to admit patients with acute TIA is anxiety-provoking for most clinicians. Rothwell and colleagues developed and tested a relatively simple risk-stratification tool to identify first-ever TIA patients at high or low risk for stroke within 7 days of TIA.

Variables that had been validated as predictive of stroke after TIA (not necessarily short-term stroke) in previous studies were included in the model. Additional clinical characteristics sometimes cited as predictive of risk (e.g., carotid stenosis, crescendo pattern, and multiplicity) were not considered. The authors state that the score probably has good external validity but that further validation is required. In short, the score is not quite ready for general clinical use without independent validation in a separate, clearly characterized, representative TIA cohort (3).

Should high-risk TIA patients be admitted to hospital for observation and evaluation? There is no proven intervention to decrease short-term stroke risk, but early initiation of established secondary prevention strategies should logically reduce stroke once the cause of TIA is determined. For patients at highest risk, hospital admission would surely facilitate the earliest possible use of thrombolysis if stroke occurred, and the earliest possible use is important (4).

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