SELECTED ARTICLES

Prognosis of patients discharged from the emergency department with a diagnosis of transient ischemic attack

Clinical question
What is the prognosis of patients who are discharged from the emergency department (ED) with a diagnosis of transient ischemic attack (TIA)?

Article chosen
Johnston SC, Gress DR, Browner WS, Sidney S. Short-term prognosis after emergency department diagnosis of TIA. JAMA 2000;284:2901-6.

Objective
To determine the short-term risk of stroke and other adverse events after an ED diagnosis of TIA.

Background
Transient ischemic attacks are common. Approximately 15% of stroke victims report prior TIAs, and 300 000 TIAs are reported annually in the US. TIAs are usually brief, and most patients have returned to baseline by the time of their ED evaluation. While antiplatelet agents and anticoagulants for atrial fibrillation are known to decrease stroke risk, the need for urgent intervention is not clear. A paucity of studies describing the natural history of TIA has led to marked practice variation.

Population studied
All ED patients treated in 16 hospitals in a health maintenance organization (Kaiser–Permanente) in northern California between March 1997 and February 1998 with a database diagnosis of TIA were reviewed. Exclusion criteria included: no ED records available (n = 30), not members of the Kaiser health plan (n = 27), coded diagnoses other than TIA (n = 25), or prior ED-treated TIA during the study period (n = 8).

Study design
After identification of study subjects in the database, medical records were reviewed by trained analysts in conjunction with a neurologist. "Definite TIA" was defined using WHO criteria; however, all patients with an ED diagnosis of TIA were included in the analysis. Patient characteristics, medical history, TIA symptom details, medications, physical findings and treatment plans were abstracted using predefined criteria. Patients were followed for 90 days after the index TIA. The primary outcome measure was stroke occurrence during the follow-up period. Other outcome measures included death, recurrent TIA, and hospitalization for cardiovascular events.

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Results
1797 patients were identified, and 1707 were enrolled in the study. During the 90-day follow-up period, 428 patients (25.1%) suffered adverse events, including 216 recurrent TIAs (12.7%), 180 completed strokes (10.5%), 45 deaths (2.6%) and 44 hospitalizations for cardiovascular events (2.6%). Alarmingly, half of the 180 completed strokes occurred within 2 days of ED discharge. Five factors were independently associated with stroke risk. These were: symptom duration >10 minutes (odds ratio [OR], 2.3; 95% confidence interval [CI], 1.3–4.2; $p = 0.005$), diabetes mellitus (OR, 2.0; 95% CI, 1.4–2.9; $p < 0.001$), weakness (OR, 1.9; 95% CI, 1.4–2.6; $p < 0.001$), age >60 years (OR, 1.8; 95% CI, 1.1–2.7; $p = 0.01$) and speech impairment (OR, 1.5; 95% CI, 1.1–2.1; $p = 0.01$). Patients with no risk factors developed no strokes, while patients with all 5 factors had a 34% stroke rate. Among the 918 patients not previously taking anticoagulant or antiplatelet agents, the 775 who had an antiplatelet agent initiated suffered fewer strokes than the 143 who did not (9% vs. 13%). Because of the relatively low numbers involved, this 4% absolute risk reduction did not achieve statistical significance.

Conclusion

Short-term risk of stroke and other adverse events among patients presenting to an ED with a TIA is substantial. Patient characteristics may help identify TIA patients who require expeditious evaluation and treatment.

Comments

Despite regional variation, the accepted standard of care for most Canadian sites is to manage TIA on an outpatient basis. If the 48-hour stroke rate reported by Johnston and colleagues in *JAMA* can be generalized to Canadian settings, these data are of concern. But they are also puzzling, in that they differ from our clinical experience and from previous literature. If 1 in 20 TIA patients returned with a completed stroke within 48 hours, this would be an alarming phenomenon and, at least at our stroke centre, neither emergency physicians nor neurologists are remarking on it. This raises the possibility of a sampling or referral bias, whereby, for some reason, patients at higher risk were selectively enrolled in the study or lower-risk patients were missed.

In a British community-based study from 1981 to 1986, Dennis and coworkers[1] followed 184 TIA patients and reported stroke rates of 4.4%, 8.8% and 11.6% at 1, 6 and 12 months respectively. These rates are concerning, but lower than reported in the Johnston and colleagues study. Unfortunately, Dennis and coworkers did not report 2-day stroke risk, and a potential confounder was a 3-day median delay from the time of the incident TIA to notification of the stroke project. Any patient who suffered a stroke prior to notification would have been excluded.

Johnston and colleagues did a post hoc analysis of their data to stratify patients as to their stroke risk. Giving age >60 years, diabetes, duration >10 minutes, weakness, and speech impairment each one point; stroke risk within 90 days ranged from zero with no points to 34% with 5 points. Kernan and colleagues[2] have also developed and validated a stroke prognosis instrument to predict stroke or death risk following a TIA or stroke that may be of value in helping us identify those patients at greater risk, allowing for an expedited work-up or admission.

These results suggest that, regardless of any potential biases, there is a high-risk subset of TIA patients who require extremely rapid investigation, in hospital if necessary. Canadian emergency physicians should collaborate with their neurology colleagues to clarify the best approach to the disposition of TIA patients presenting to the ED.

Competing interests: None declared.

References

1. Dennis M, Bamford J, Sandercock P, Warlow C. Prognosis of transient ischemic attacks in the Oxfordshire community stroke project. Stroke 1990;21:848-53.
2. Kernan WN, Viscoli CM, Brass LM, Makuch RW, Sarrel PM, Roberts RS, et al. The Stroke Prognosis Instrument II (SPI-II): a clinical prediction instrument for patients with transient ischemia and nondisabling ischemic stroke. Stroke 2000;31:456-62.

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