Evidence-Based Emergency Medicine
Clinical Synopsis

TAKE-HOME MESSAGE

Several clinical features are strongly suggestive of hemorrhagic cause, though none is accurate enough to delay or replace neuroimaging.

METHODS

OBJECTIVE

To determine the accuracy of clinical examination in distinguishing hemorrhagic stroke from ischemic stroke.

DATA SOURCES

The authors conducted searches of English-language articles published in MEDLINE and EMBASE from January 1966 to April 2010, as well as "all related articles" in PubMed and bibliographies of selected articles.

STUDY SELECTION

Prospective studies of adult subjects with stroke (excluding subarachnoid hemorrhage) in which clinical findings were compared with accepted diagnostic standards (computed tomography or autopsy). Studies were graded according to a previously used scale in the rational clinical examination series that integrates sample size and quality markers.

DATA EXTRACTION AND ANALYSIS

Both authors independently assessed all selected articles for quality and extracted relevant data. Authors extracted sensitivities and specificities and calculated likelihood ratios and 95% confidence intervals, pooling data with a random-effects model.

Does This Patient Have a Hemorrhagic Stroke?

EBEM Commentator
Andrew Worster, MD, MSc
Teresa Chan, MD
Division of Emergency Medicine, McMaster University, Hamilton, Ontario, Canada

Results

The Table represents 6,438 subjects from 19 studies graded high ("1"; 6/19) to moderate quality ("2" or "3"; 13/19).

Probability of hemorrhagic stroke.

Clinical Finding	LR	95% CI
Coma	6.2	3.2-12.0
Neck stiffness	5	1.9-12.8
Seizures	4.7	1.6-14.0
Diastolic blood pressure >110 mm Hg	4.3	1.4-14.0
Vomiting	3	1.7-5.5
Headache	2.9	1.7-4.8
Cervical bruit	0.12	0.03-0.47
Previous TIA	0.34	0.18-0.65
Absence of xanthochromia on LP	0.31	0.19-0.49
Siriraj score >1	5.7	4.4-7.4
Siriraj score <1	0.29	0.23-0.37
Siriraj score from 1 to −1	0.94	0.77-1.1

LR, Likelihood ratio; *CI*, confidence interval; *TIA*, transient ischemic attack; *LP*, lumbar puncture.

Commentary

Stroke is the third leading cause of death in the United States, and up to 30% of survivors are permanently disabled.[2] The 2 main subtypes of vascular strokes, hemorrhagic and ischemic, represent 13% and 87%, respectively, of vascular strokes in the United States, although a greater proportion of hemorrhagic strokes is observed in other parts of the world.[3] A previous installment in this series examined clinical findings most likely to distinguish stroke from other causes of neurologic deficit,[4] whereas the authors here determine the diagnostic value of clinical examination in distinguishing hemorrhagic from ischemic stroke according to studies comparing clinical findings at presentation with neuroimaging or postmortem results. Except for the English-language limitation, the search strategy was comprehensive, and the article appraisal and data abstraction processes were independent. One limitation of the data includes the accuracy of clinical findings in those with cognitive or speech impairment.[4]

The challenge for emergency physicians, however, is that cerebrovascular events exhibit a wide range of clinical presentations. The clinical examination features outlined here may be useful in settings in which access to imaging is limited or delayed and may help to expedite consultation services and preparation for therapies in settings in which imaging is readily available.

1. Runchey S, McGee S. The rational clinical examination: does this patient have a hemorrhagic stroke? *JAMA*. 2010;303:2280-2286.
2. Goldstein LB, Simel DL. Is this patient having a stroke? *JAMA*. 2005;293:2391-2402.
3. Lloyd-Jones D, Adams R, Carnethon M, et al; American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2009 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*. 2009;119:480-486.
4. Seupaul RA, Worster A. Evidence-based emergency medicine/rational clinical examination abstract. Is this patient having a stroke? *Ann Emerg Med*. 2009;54:120-122.

This is a rational clinical examination abstract, a regular feature of the *Annals*' Evidence-Based Emergency Medicine (EBEM) series. Each features an abstract of a rational clinical examination review from the *Journal of the American Medical Association* and a commentary by an emergency physician knowledgeable in the subject area. The source for this rational clinical examination review abstract is: Runchey S, McGee S. The rational clinical examination: does this patient have a hemorrhagic stroke? *JAMA*. 2010;303:2280-2286.[1] The Annals' EBEM editors assisted in the preparation of the abstract of this rational clinical examination review.

Rational Clinical Examination Author Contact
Shauna Runchey, MD, MPH
Department of Medicine
University of Washington
Seattle, WA
E-mail: srunchey@u.washington.edu