

# Review: History and physical examination can accurately identify migraine and the need for neuroimaging in patients with headache

Detsky ME, McDonald DR, Baerlocher MO, et al. Does this patient with headache have a migraine or need neuroimaging? *JAMA*. 2006;296:1274-83.

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

## QUESTION

In patients with headache, do features of the history and physical examination accurately identify those with migraine and those who should undergo neuroimaging?

## METHODS

**Data sources:** MEDLINE (to November 2005) and reference lists of primary studies, review articles, and textbooks.

**Study selection and assessment:** Studies that assessed the usefulness of history and physical examination in predicting the diagnosis of a migraine-type headache using International Headache Society criteria applied by a neurologist as the gold standard, and the presence of significant intracranial pathology in adults with nontraumatic headache using neuroimaging as the gold standard. Studies assessing patients with a specific underlying chronic disease were excluded. 4 studies of migraine ( $n = 1210$ , mean age range 39 to 40 y, prevalence 50% to 89%) and 11 studies of neuroimaging ( $n = 3725$ , mean age range 35 to 52 y, prevalence of abnormality 0% to 64%) met the selection criteria.

**Outcomes:** Positive (+LR) and negative (−LR) likelihood ratios.

## MAIN RESULTS

The 4 studies evaluating screening tests for migraine (mainly in patients without aura) used different clinical prediction rules, so the

results could not be pooled. Headache features that were common elements in rules tested in  $\geq 2$  studies were: disabling or limiting activity, duration  $> 4$  hours, unilateral location, nausea, and photophobia. In the 4 studies, a positive screen resulted in +LR values for definite migraine of 3.1, 3.2, 5.0, and 5.8, respectively, and a negative screen resulted in corresponding −LR values of 0.19, 0.25, 0.08, and 0.45, respectively. In the highest quality study ( $n = 166$ ), when  $\geq 4$  of 5 features (captured by the mnemonic, POUNDing: Pulsating, 4 to 72 hOurs duration, Unilateral location, Nausea, and Disabling intensity) were present, the +LR for definite or possible migraine was 24 (95% CI 1.5 to 388). Some clinical features were associated with increased or decreased

risks for intracranial abnormality (Table). Features not associated with intracranial abnormality included worsening headache, quick-onset, new-onset, increased severity, nausea, migraine, and male sex.

## CONCLUSIONS

In patients with headache, a combination of simple historical features can accurately diagnose migraine. Several aspects of the history and physical examination can identify patients who are at increased risk for intracranial abnormality and should, therefore, undergo neuroimaging.

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### Individual clinical features associated with intracranial abnormality on neuroimaging in patients with headache\*

Clinical features	Number of studies (n)	+LR	-LR
Cluster-type headache	2 (1965)	11	0.95
Abnormal neurological findings	6 (2216)	5.3	0.71
Undefined headache	2 (1965)	3.8	0.66
Headache with aura	3 (204)	3.2	0.51
Headache aggravated by exertion or valsalva maneuver	2 (202)	2.3	0.70
Headache with vomiting	2 (191)	1.8	0.47

\*Diagnostic terms defined in Glossary.

## COMMENTARY

The review by Detsky and colleagues focused on 2 objectives: finding a more efficient method of diagnosing migraine than the full International Headache Society criteria, and identifying clinical features that indicate the need for neuroimaging.

For the first objective, the literature search identified 5 studies that satisfied the review's criteria, only 1 of which provided the highest level of evidence (1). The review focused on that study's criteria for making the diagnosis of migraine. Notably absent from the POUNDing mnemonic are 2 criteria: that headache is aggravated by regular activity or by light and sound. Nevertheless, providing a mnemonic that is truly memorable provides the busy primary care practitioner with a valuable tool.

For the second objective, Detsky and colleagues found only 1 study that provided a high level of evidence (2). That study, limited to patients with chronic headache presenting to a neurology clinic in Spain, delivered 3 significant findings: abnormal findings on neurological examination predicted a positive result on neuroimaging; "undefined headache" increased the probability of abnormality; and, conversely, a defined headache reduced that probability. The study by Sempere and colleagues

(2) suggested that patients with cluster-type headaches should receive neuroimaging. Combined with data from another study, the +LR was high at 11. Thus, although the headache may be well-defined, the diagnosis of cluster-type headache indicates the need for neuroimaging.

The review by Detsky and colleagues confirmed common practice. Presentation to the emergency department with acute thunderclap headache had a high prevalence of abnormalities on neuroimaging (22% and 64% in 2 studies), therefore, imaging is recommended for this subgroup.

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