Subarachnoid hemorrhage

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1 Nontraumatic subarachnoid hemorrhage is an uncommon but potentially fatal cause of headache

Headaches are common and account for 2% of visits to the emergency department.[1] Subarachnoid hemorrhage, often from a bleeding cerebral aneurysm, causes 1% of headaches seen in emergency departments and has a mortality rate of 44%.[2] In 2012, a guideline for the management of aneurysmal subarachnoic hemorrhage was published by the American Heart Association and the American Stroke Association.[2]

2 Subarachnoid hemorrhage can confidently be ruled out using specific criteria

In patients presenting to the emergency department with sudden onset, nontraumatic and rapidly peaking (less than one hour) headache, and in the absence of any neurologic deficits, the Ottawa Subarachnoid Hemorrhage Rule can be used to exclude subarachnoid hemorrhage without testing. Subarachnoid hemorrhage can be ruled out if all of the following conditions are absent in the patient: age 40 or more years of age, neck pain or stiffness, loss of consciousness, onset during exertion, thunderclap (instantly peaking) headache and limited neck flexion on examination.[3] The rule has 100% (95% confidence interval [CI] 97.2%–100%) sensitivity for subarachnoid hemorrhage.[3]

3 Computed tomography (CT) can rule out subarachnoid hemorrhage within six hours

For at-risk patients (i.e., those not ruled out by the Ottawa Subarachnoid Hemorrhage Rule), CT imaging of the head within six hours of headache onset is 100% sensitive (95% CI 97%–100%) and 100% specific (95% CI 99.5%–100%) for subarachnoid hemorrhage.[4] Therefore, rapid CT scanning should be undertaken for at-risk patients. In anemic patients, blood appears isodense, and CT is unreliable.

4 At-risk patients presenting after six hours will require a lumbar puncture

Lumbar puncture is indicated in patients with normal CT who present six or more hours after headache onset. One-third of lumbar punctures are associated with blood from a traumatic tap. Absence of xanthochromia and the presence of fewer than 2000×10^6/L red blood cells on a tap excludes the diagnosis of aneurysmal subarachnoid hemorrhage, with a sensitivity of 100% (95% CI 74.7%– 100%) and a specificity of 91.2% (88.6%–93.3%).[5]

5 CT angiography may be considered

Presence of an aneurysm may help guide the decision for neurosurgical repair.[2] CT angiography may be considered in patients with any of the following: elevated erythrocyte counts or xanthochromia on lumbar puncture, subarachnoid hemorrhage visible on CT, presentation six or more hours after onset of headache with contraindication to lumbar puncture, presentation one week after onset of headache or a high index of clinical suspicion without a completely normal lumbar puncture.[1]

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