

## Expert Opinion

# Benign or Sinister? Distinguishing Migraine From Subarachnoid Hemorrhage

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Distinguishing a first time migraine from a secondary cause of headache such as subarachnoid hemorrhage can be challenging even for the experienced clinician.

### CLINICAL HISTORY

A 30-year-old woman presented with a 4-hour history of a bifrontal-temporal throbbing headache. The headache was initially mild and then progressed over about 2 hours to a severe intensity of 10/10, the worst headache she had ever had, associated with nausea, vomiting, light and noise sensitivity. She had no visual symptoms, fever, or systemic symptoms. There was a history of occasional mild headaches without any known triggers. Past medical history was negative. Vital signs were normal. The neck was supple. The neurological examination was normal. She was given sumatriptan 6 mg subcutaneously. The headache and

associated symptoms resolved within 2 hours. The patient was offered diagnostic testing but she declined.

**Questions.**—Can a subarachnoid hemorrhage (SAH) present with an initially mild but then progressively severe headache? What is the shortest and longest duration of headache due to SAH in those with normal or near normal neurological examinations? Does a response to a triptan exclude a subarachnoid hemorrhage? Was diagnostic testing indicated? Should patients with probable first time migraines undergo testing?

### EXPERT OPINION

The issue here is how confident can a clinician be in making a diagnosis of a benign primary headache syndrome (in this case migraine) rather than a potentially more sinister secondary syndrome? Can we be sure, on clinical grounds alone, that this is “just” a migraine, rather than SAH, or other symptomatic thunderclap headache syndromes,<sup>1</sup> or are investigations required? Clinicians have different levels of comfort when reaching clinical diagnoses, but I think I would be confident of migraine, and would not plan investigations. My reasoning is as follows.

**The Evolution of the Headache.**—SAH headache is always either instantaneous, or reaches its maximum

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within minutes at the most.<sup>2</sup> One prospective study reported that for all patients with aneurysmal SAH who were able to describe their headache onset, half described it as instantaneous, the remainder reaching a maximum within 5 minutes.<sup>3</sup> I have not seen a patient with aneurysmal SAH present with a gradually evolving headache (unusually for the United Kingdom, I work in a unit where many SAH patients are admitted and investigated by neurologists rather than surgeons), and while I am not (yet) arrogant enough to suggest that it therefore never happens, it must be exceedingly rare, and does not justify investigating all such patients. Of course, coma or confusion may mask the history of headache, but that is not the case here.

**Length of Headache.**—SAH headache usually lasts at least a few days, and can last weeks, so the “late presenting” patient seen after a few weeks of headache, but with a very abrupt onset, may still merit investigation. These patients pose both a diagnostic and management problem, and thus the message must be to all doctors and public—do not ignore a sudden onset headache. How short an SAH headache may be is less clear. The “experts” suggest at least an hour or two,<sup>4</sup> and the 2 best prospective, community-based epidemiological studies defined sudden headache of possible SAH origin as lasting at least an hour (and of maximum intensity within 10 and 60 seconds, respectively).<sup>5,6</sup> I would not include SAH in the differential of a sudden headache that had completely *resolved* within an hour.

**Associated Features.**—The presence of nausea, vomiting, photo- and phonophobia all favor migraine, as do the lack of neck stiffness and other focal neurological signs, but all may occur with less benign headache syndromes.<sup>3</sup>

**Therapeutic Response to Sumatriptan.**—The response to sumatriptan is very reassuring. All of her symptoms (including her worst headache ever) *resolved* within 2 hours of treatment, and I would suggest that such a dramatic response only occurs in migraine. Previous case reports have suggested that SAH headache may respond to triptans,<sup>7,8</sup> but careful examination of these cases reveals that the headache *improved*, which is not the same as *resolution*. So while it is impossible to suggest that a *response* to a triptan excludes SAH, I think rapid and complete *reso-*

*lution* is highly improbable in SAH or indeed other nonmigraine syndromes. But that must not obscure the important message that migraineurs are not immune from SAH, and one should treat with suspicion a sudden onset headache in such a patient, not simply assume it is migraine, because of their past history.

In summary, I do not think CT brain and lumbar puncture were indicated, and that the patient was right to decline—perhaps she knew that up to 5% of us over 30 may harbor an incidental unruptured intracranial aneurysm, and that we have little idea what to do with these other than worry about them.<sup>9</sup> I recognize that it is easy to be wise in retrospect, especially when writing in the peace and calm of my office, and that life on the frontline is different. In my outpatient clinic, I rarely see acute migraine unfolding in front of my eyes, but on the few occasions that it has occurred, I have been struck by how unwell the patient looks, and how frightening a first episode must be for a patient and their family (and sometimes their doctors). Similarly, on the wards I have learned that “eyeballing” patients is a very poor way of discriminating benign from sinister syndromes, however good I might think my clinical skills are! One can never factor in that “gut feeling” experienced clinicians get in the heat of battle, and maybe I too would have opted for tests in the same scenario for real. But I teach my interns to think very carefully before subjecting patients with headache to tests; missing SAH is bad enough, but randomly investigating every headache is equally bad medicine.

Whether patients with first time migraine need investigation can only be answered with the rather unhelpful “it depends.” A confident diagnosis (as here) does not warrant investigation, but more abrupt presentations (“crash migraine”) certainly do, as we know clinical features alone are insufficient to help us differentiate the benign from the sinister in acute onset headache syndromes,<sup>3</sup> and that some rare pathologies may mimic migraine.<sup>10</sup> Similarly, the presence of focal neurological symptoms/signs, unless very typically of an evolving migrainous nature, are likely to trigger at least a brain scan. Ironically, in the United Kingdom at least, such emergency patients are usually seen first by junior nonspecialist doctors, who are least likely to be able to make a confident diagnosis of a benign primary

headache syndrome, and thus many such patients are investigated, at least partially, anyway! Neurology has always relied upon good clinical skills, and while we should embrace new technology where appropriate, let us not forget that in many situations, particularly headache, clinical skills are all we need.

*Conflict of Interest:* None declared

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