



*Emergency
Care Institute*
NEW SOUTH WALES



ACI NSW Agency
for Clinical
Innovation

BLOOD FROM A STONE

Learning from our Incidents:
RED FLAGS in the Emergency Department



The case

A 40 year old female patient presented to a small rural ED complaining of a severe headache, neck pain and vomiting.

She could obey commands, but was confused to time and place. Her speech was slurred.

The case

Her signs were as follows:

- *BP 154/92mmHg*
- *BGL 9.6mmol/L*
- *Pain score 9/10*
- *GCS 13/15*

The case

Patient was reviewed and assessed by a Nurse Practitioner, who found her to be restless and agitated.

She reported having a headache since the morning with intermittent confusion and vomiting. The patient's husband reported that the patient had reduced oral intake and spent most of the last two days in bed.

Which features of this patient's presentation are the Red Flags indicating a high risk of serious disease?

The case

On examination, patient noted to have a “coated” tongue and dry lips, and a rash was noted over the left side of her chest. Normal air entry on chest auscultation.

Impression: Viral illness + agitation of unknown cause.

What other diagnoses need to be considered given the patient's presentation?

The case

The patient was given IV fluids, chlorpromazine and midazolam.

The Nurse Practitioner discussed the patient with medical staff, and a decision was made for patient to remain in ED overnight.

The case

Following the administration of IV fluids, the patient was reviewed and found to be less agitated.

Urinalysis completed with nil abnormalities detected.

Overnight, GCS recorded as 11/15. There was also note of intermittent agitation and sensitivity to light when her pupils were being assessed.

The case

The next day, the patient was found to have a severe headache, posterior neck pain and ongoing agitation and confusion.

Contact initiated with referral hospital.

What specific information needs to be conveyed to the referral facility?

The case

Arrangements were made for prompt transfer to referral facility.

On arrival, patient was given IV ceftriaxone and dexamethasone.

A CT Brain was arranged, which showed:
extensive subarachnoid bleeding.

The case

Consultation and referral to tertiary facility undertaken and patient intubated in preparation for helicopter transfer.

Underwent neurosurgical intervention but clinically deteriorated on day 2 post-op with further CT Brain showing major brain injury.

The case

Patient died 8 days after initial presentation.

What is the lesson here?

Whenever we see a patient with a headache we MUST consider the possibility of subarachnoid haemorrhage.



What's the evidence?

- **Subarachnoid haemorrhage (SAH)** accounts for 1-3% of headache presentations to emergency departments¹. Although a rare diagnosis, it is an important one not to miss due to the possibility of catastrophic consequences.
- Acute sudden-onset, severe headache (referred to as “thunderclap headache”) prompts concerns for SAH or other serious intracranial pathology. Typically, headache intensity is excruciating (usually described as worst of life), and reaches that maximal intensity within seconds to a minute².

What's the evidence?

- Associated clinical features of large SAH are generally obvious (altered conscious state, signs of raised intracranial pressure or neurological deficit³).
- Up to half of all patients with SAH present alert and neurologically intact, and without severe symptoms or signs⁴. These patients are those who stand to benefit most from prompt diagnosis, but are also the most likely to be misdiagnosed³.

What's the evidence?

- In a five-year multicentre study, Perry et al.³ found certain clinical findings were strongly and reliably associated with SAH. These were:
 1. arrival by ambulance
 2. age > 40yrs
 3. complaint of neck stiffness or pain
 4. onset with exertion
 5. Vomiting
 6. witnessed loss of consciousness
 7. raised blood pressure

What's the evidence?

The presence of one or more of these findings in a patient with an acute non-traumatic 'thunderclap' headache could help to identify which neurologically intact patients with headache required investigation to rule out SAH.

Investigation should be performed whenever SAH is suspected clinically. If appropriate services for investigation and management are not accessible at the initial site where a patient presents for assessment, efforts should be made to stabilise the patient and arrange for prompt retrieval and transfer to a suitable facility.

In summary, features of headache that should raise suspicion for SAH:

- sudden-onset
- severe, excruciating, “worst ever”
- maximal severity at onset
- onset with exertion

Associated clinical findings that should prompt further investigation for SAH or other serious intracranial pathology include:

- focal neurological signs
- change in level of consciousness/reduced GCS
- vomiting
- syncope
- neck stiffness

Patient history features that are of significant concern for which more serious causes of headache need to be considered:

- elderly
- recent trauma
- being on anticoagulant therapy
- uncommon headache during pregnancy

Access the ECI Clinical Tool: Headache

<http://www.ecinsw.com.au/headache>

References

1. Morgenstern L.B., Huber J.C., Luna-Gonzales H., Saldin K.R., Grotta J.C., Shaw S.G. et al. *Headache in the emergency department*. Headache, 2001. 41: pp.537-41.
2. Edlow J.A., Panagos P.D., Godwin S.A., Thomas T.L., Decker W.W. *Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with acute headache*. Annals of Emergency Medicine, 2008. 52: pp.407-36.
3. Perry J.J., Stiell I.G., Sivilotti M.L. et al. *High-risk clinical characteristics for subarachnoid haemorrhage in patients with acute headache: prospective cohort study*. British Medical Journal, 2010. 341: pp.5204-5212.
4. Weir B. Headaches from aneurysms. Cephalalgia 1994;14:79-8.

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