Clinical Cases for AMU – Case Seven: Headache

Introduction

These cases are designed to support your learning during your time in Acute and General Medicine. You can use them when you have free time on the ward. They can be done either alone, or in a small group. They use fictional scenarios to demonstrate learning points from common presentations to the Acute Medical Unit (AMU) and on the General Medical wards. As you work through the cases, you will find a mixture of case discussions, practical activities, and practice questions to assess your learning.

If there is a knowledge check or interpretation exercise, the answer can be found on the back of the same page that the question is on.

Case History

Ben is a 36-year-old man who has been referred to the Medical Assessment Unit by his GP with a headache. He isn't usually troubled by headaches. The headache came on at around 9.30pm and last night. He says that is a throbbing pain all over his head, and there is no radiation. He denies any weakness, change in sensation, or alteration to his speech. He states that he is struggling with bright lights but denies any other visual disturbance. He denies fever or rash.

Ben has no past medical history. He drinks about 10 units of alcohol once or twice a week and he doesn't smoke. He works as a software engineer.

His observation chart is enclosed. They are marked observations one.

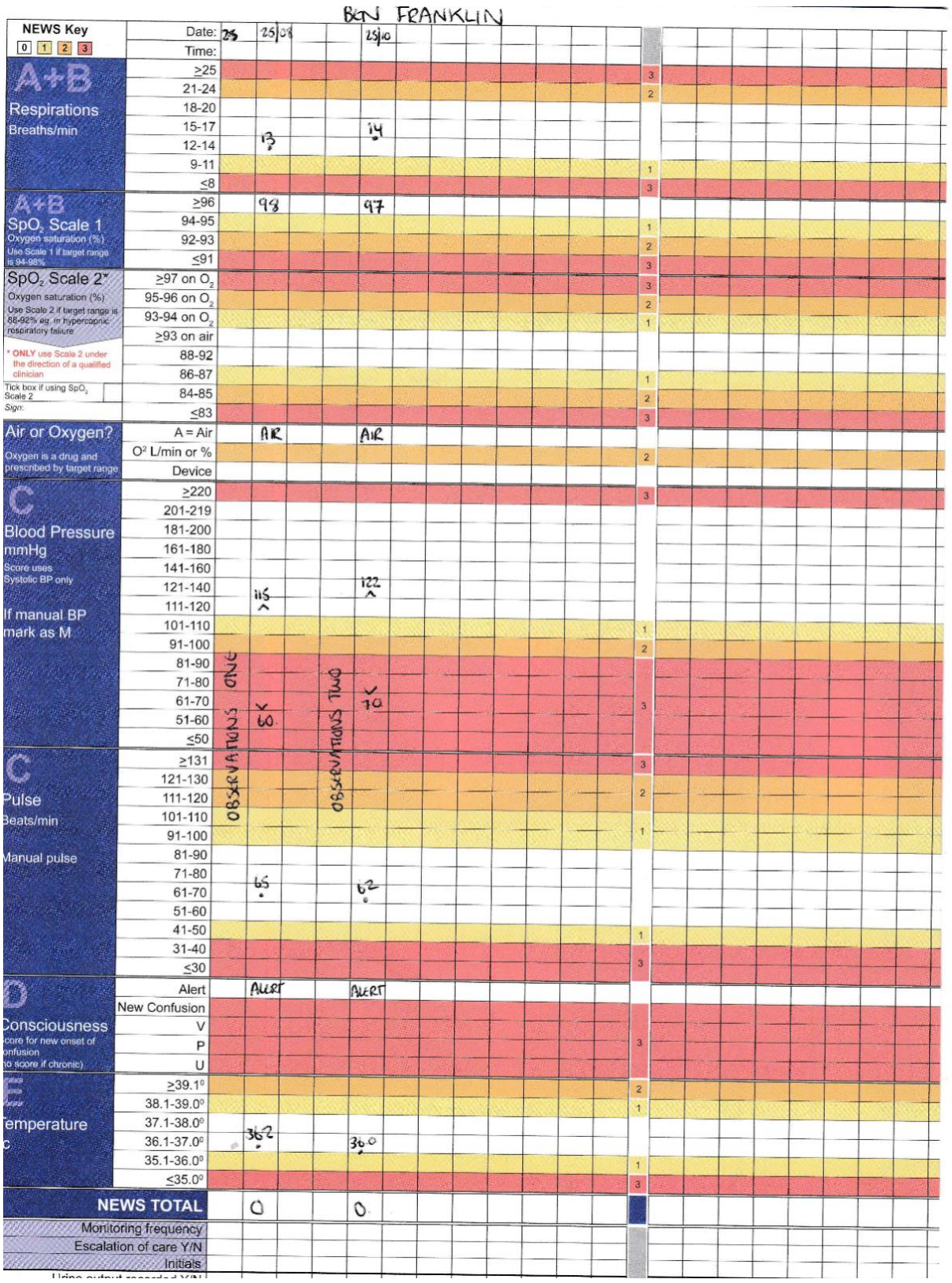
On examination, he looks uncomfortable. He is warm and well perfused, and his capillary refill time is less than two seconds. His heart sounds are normal with no additional sounds. His chest is clear. His abdomen is soft and non-tender, and bowel sounds are present. On neurological examination, Ben finds it uncomfortable when a light is shone in his eyes. His pupils are 4mm and they are equal and reactive. Eye movements, visual fields and accommodation reflex are all normal. There is no facial asymmetry and facial sensation is normal. Peripheral tone, power, reflexes, co-ordination, and sensation are all unremarkable.

<u>Activity One</u>

Fundoscopy can be an important part of examination when assessing patients with headaches, as swelling of the optic disc, known as papilloedema, is a feature of raised intracranial pressure. It is a skill that requires practice. Find an ophthalmoscope. Either examine a colleague's eyes or ask a patient to volunteer to let you examine their eyes.

<u>Knowledge Check One</u>

1. The history is key when assessing a patient with a headache. What additional information would be important to elicit from Ben?
2. The differential for headaches is wide. List as many causes of headache as you can think of.



Knowledge Check One - Answers

1. Using the SOCRATES method of taking a pain history as a template, the additional parts of the history we require are:
    a. Onset – this is very important in headaches. Did the headache come on gradually or suddenly. At what point was it at its most severe? Were there any headaches prior to this one?
    b. Associated features – A few have been mentioned, but you would also be interested in whether there was any neck stiffness? Was there an aura? Was there a history of lacrimation, or rhinorrhoea? Are there any constitutional symptoms like weight loss or night sweats? Is there a history of associated nausea and vomiting?
    c. Timing – has the headache been constant since onset, or has it waxed and waned? Did it wake the patient up from sleep?
    d. Exacerbating and relieving factors – does the headache get worse with changes in posture? Is it worse with coughing or straining? Do painkillers help?
    e. Severity – is it the most severe headache the patient has ever had?

2. There are many, many causes of headache and this is not an exhaustive list. However, some of the causes of headache you need to consider when a patient is coming to hospital include:
    a. Subarachnoid haemorrhage (SAH)
    b. Intracranial haemorrhage
    c. Meningitis
    d. Brain tumour (either primary CNS tumour or metastases)
    e. Giant cell arteritis
    f. Acute glaucoma
    g. Idiopathic intracranial hypertension
    h. Central venous sinus thrombosis
    i. Cluster Headache
    j. Migraine
    k. Medication overuse headache

Knowledge Check Two

What 'red flags' would you be concerned about in a patient with headache?

Additional information

The headache came on very suddenly at the occipital region of Ben's head. It was at its most intense straight away, and he describes it as being 10/10 in severity. Since the headache came on, there has been no real change in its intensity. Nothing has made it better or worse, and there is no change in the severity of the headache with changes in posture, coughing or straining.

Ben's blood results have now returned. All of his bloods, including inflammatory markers, are within normal ranges.

Knowledge Check Three

1. Based on the additional information available, what is the most important diagnosis to exclude?
2. What would be your next steps?

Knowledge Check Two - Answers

The pneumonic SNOOP4 can be used to remember red flags for secondary headache, i.e, where headache is caused by another condition. The table below outlines the red flags.

Red flag	Condition of concern
Systemic symptoms/signs of disease	With fever, may be concerned about meningitis With constitutional symptoms such as fever, weight loss or night sweats, would be concerned about malignancy. If there were symptoms of polymyalgia rheumatica, jaw claudication or visual changes in a patient over 50 then giant cell arteritis would be a concern.
AND Secondary risk factors (e.g., malignancy, HIV infection, immunocompromised, recent trauma)	A history of malignancy would raise concern for cerebral metastases. A history of HIV infection or an immunocompromised patient would raise concern for opportunistic infection A history of recent trauma would raise concern for intracranial bleeding.
Neurological symptoms or signs	Intracranial mass, intracranial haemorrhage, subarachnoid haemorrhage, abscess. Focal neurology is concerning for a focal brain lesion
Onset sudden	Sudden onset headache is concerning for subarachnoid haemorrhage
Onset over the age of 50 years	A new headache in a patient over the age of 50 is more concerning for a secondary cause of headache as there is increased risk of malignancy and intracranial events. In a patient over 50, giant cell arteritis is a potential cause of headache
Progression/Pattern change	Progressive headache raises concern for malignancy. A change in pattern in a patient who has chronic headaches should lead to clinicians considering further investigation
Papilloedema	Papilloedema suggests raised intracranial pressure
Positional change	Headaches that are worse when lying down indicate raised intracranial pressure. Headaches that are worse when standing up are low pressure headaches.
Precipitated by coughing, sneezing or exercise	Headaches worse on coughing or sneezing sometimes suggest raised intracranial pressure. They can also suggest posterior fossa deformities such as a Chiari malformation.

Knowledge Check Three - Answers

1. A severe headache that reached its maximum intensity within a minute is a description consistent with a thunderclap headache. Therefore, subarachnoid haemorrhage needs to be excluded.
2. When a subarachnoid haemorrhage is suspected, the first investigation should be an urgent CT head.

Results

Ben has an urgent CT head performed. The report for the CT scan states that there is no acute intracranial abnormality.

Knowledge Check Four

1. What is the most important diagnosis to exclude now?
2. How would you proceed in the investigation of Ben's headache?

Knowledge Check Four - Answers

1. The most important diagnosis to exclude remains a subarachnoid haemorrhage. In patients who have a CT scan within 6 hours of the onset of their headache, CT scanning is almost 100% sensitive in detecting SAH if the scan is reported by an experienced radiologist. However, after this 6-hour period, a CT head alone cannot exclude the condition, so further testing is required.

2. The next step in investigation of suspected SAH is lumbar puncture (LP). In SAH, blood cells in the CSF lyse, releasing bilirubin. Bilirubin in the CSF is known as xanthochromia, and it can be detected by laboratory analysis. The CSF may also be stained yellow. At least twelve hours should pass between the onset of the headache and the LP, to allow time for the red blood cells to lyse.

The next day…

Ben is admitted to the hospital for analgesia for symptomatic relief of his headache. After a consultant review, a lumbar puncture is planned.

Activity Two

Read about the lumbar puncture procedure. A comprehensive description of how the procedure is performed is found here https://www.med.scot.nhs.uk/simulation/the-mastery-programme. Lumbar punctures are frequently performed in the Acute Medical Unit and in the Ambulatory Care Unit. Find out if one is being performed today. Performing the procedure requires an operator and an assistant. See if you can act as the assistant during the procedure.

Further results

You now have the results of the CSF analysis.

Parameter	**Result**
Biochemistry	
Appearance	Yellow-tinged fluid
Protein (mg/L)	250
Glucose (2.5 – 4 mmol/L)	4.5
Xanthochromia	Present
Microbiology	
Red cell count (<1 x 10^6/L)	2491
White cell count (<1 x 10^6/L)	<1
Organisms	No organisms seen

Interpretation One

1. What abnormalities can be seen on the CSF analysis?
2. What diagnosis do these abnormalities indicate?
3. What should your next steps be?

Management

After a discussion with the Neurosurgical team, Ben has a CT angiogram of the head, which identifies an anterior communicating artery aneurysm. The Neurosurgeons liaise with the Interventional Radiologists, and he is taken for endovascular coiling of the aneurysm by the Interventional Radiologists. He is started on nimodipine to prevent delayed cerebral ischaemia, often referred to as vasospasm. He recovers well and he is discharged home. He has no residual neurology.

Two months later…

Two months later, Ben is referred back to the Medical Assessment Unit with a headache. Since he had the subarachnoid haemorrhage, Ben has been having intermittent headaches. These usually settle after he takes some paracetamol and goes to bed. Since this morning he has had a severe headache. He describes a frontal headache over his right forehead and behind his right eye. He states that it is a severe stabbing pain. He describes zig-zag lines in his vision, and a tingling sensation in his right arm and right leg. He has symptoms of nausea and photophobia. With the headaches he has had since the SAH, he occasionally gets a similar visual disturbance. He does not describe any other neurological symptoms.

His second set of observations can be seen in the chart.

On examination, his cardiovascular, respiratory, and abdominal examinations are all normal. He is sensitive to the light when examining his pupils, but otherwise there is no abnormality of the cranial nerves. When examining his right arm and right leg, he says he can feel soft touch normally, but both limbs continue to have a tingling sensation. Tone, power, reflexes, and co-ordination are all normal.

Knowledge Check Four

1. Based on this history, what is the most likely diagnosis? Why?
2. What other investigations would you consider?
3. What are the options for the management of this condition:
    a. Acutely?
    b. In the long term?

Interpretation One - Answers

1. The CSF demonstrates a xanthochromia. There is also a mildly elevated glucose and raised red blood cells.

2. These findings are all consistent with a subarachnoid haemorrhage.

3. Patients with confirmed SAH should be urgently referred to the neurosurgeons. Most subarachnoid haemorrhages are caused by aneurysms, typically at the junction between major arteries and the circle of Willis. These aneurysms need to be identified and repaired.

Knowledge Check Four - Answers

1. The diagnosis is migraine. Intermittent unilateral headaches with photophobia, nausea and evidence of both visual and sensory aura (zig-zag lines and sensation change) are consistent with a diagnosis of migraine.
2. Migraine is a clinical diagnosis based on the history and examination findings. There is no investigation that can prove or disprove it. Not all patients with a headache require brain imaging, as we do not want to irradiate patients unnecessarily. Therefore, it is important to consider red flag symptoms. In a patient with a history consistent with migraines, and no red flags, brain imaging is not required.
3. Management options include:
    a. Acutely – acute treatment of migraine is supportive care with analgesia and anti-emetics. A 900mg dose of aspirin is often effective for migraine relief. If a patient is known to have migraine, they are often prescribed a triptan. These are medications they can take when they feel an attack coming on to terminate it.
    b. Chronic – in the longer term, patients who are known to have migraine should avoid triggers such as alcohol, caffeine, and sleep deprivation. They should remain well hydrated. Patients with frequent disabling migraines can be started on a preventative treatment. Options include beta-blockers such as propranolol, anticonvulsants such as topiramate and antidepressants such as amitriptyline.

Conclusion

After a dose of 900mg of aspirin, Ben's headache improves. He is discharged home with sumatriptan to take if he feels a migraine coming on. A few months later, he continues to have migraines, so he sees his GP who prescribes … as migraine prophylaxis. Since then, his symptoms are much improved.

Well done on completing this case. I hope that you have found it informative. If you have any questions, please contact …

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Thank you for completing this long case. As these cases are new intervention, we would really value your feedback.

We would be very grateful if you could complete the feedback form accessed from the QR code below.

