

Headaches

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Summary

A 30 year old lady was seen by her family doctor during a busy clinic complaining of three episodes of left-sided headache over the previous four months. The pain was usually throbbing in nature and it increased slowly in intensity over about an hour. She usually would have to lie down in a dark room to obtain some relief. Nausea, vomiting and blurred vision usually accompanied the headache. She had had headaches in the past but usually less severe and relieved by two to four paracetamol tablets per day. She reported no family history of headaches and had not started any new medication.

What would you do and what issues does this consultation raise?

Introduction

Two main dilemmas usually come up when faced with a patient complaining of headaches:

- Deciding which headaches are benign and require no intervention and those which require immediate action.
- Differentiating between tension-type headache and migraine – two common causes of headache in family medicine.

Incidence

The BEACH program, a continuous national study of general practice activity in Australia, recorded 602100 encounters per 6021 GPs that is an average of 100 encounters per GP. It showed that a patient gave headache as one of their reasons for encounter at a rate of 1.9 per 100 encounters. Females are slightly more likely to present with headaches than males (2.0 per 100 encounters for females and 1.7 per 100 encounters for males). It also showed that GPs referred patients with headache at a higher rate than for other problems and were also more likely to order imaging especially CT scans (10.8 per 100). The referral rate was at 11.4 per 100 encounters most commonly to a neurologist (2.8 per 100) or a physiotherapist (2.8 per 100).¹

Keywords

Headaches, migraine, treatment

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Differential Diagnosis

The diagnosis given to patients regarding their headaches will influence the number of visits they will make to a GP. Patients with multiple headache diagnoses make more visits and those with combinations of headache diagnoses involving migraine are the most frequent visitors.² It is thought important to give the correct diagnosis as quickly as possible to avoid frustration both to the patient and doctor.

Differentiating between primary headaches and secondary headaches is crucial. *The diagnosis of a primary headache requires that all other identifiable and probable conditions that can secondarily cause headache be excluded*³ (Table 1). In taking the history and during examination one should look out for causes of secondary headache and where appropriate special investigations such as a CT scan should be carried out to exclude such causes. In general practice, special investigations are not so easily available compared to the hospital setting so in certain cases the family doctor has to base his diagnosis on history and examination only and if these are normal but some doubt remains, review will be required.

Achieving the diagnosis

An important aspect when taking a history from a patient suffering from headaches is to let the patient talk with very little interruptions. Even the words used to gather information from the patient are very important. Open questions are more welcome than closed questions. Allowing patients to speak about their illness, the impact of such illness on their life, and also about their beliefs will lead to a better diagnosis and compliance.

Proper history taking should include information about the onset of the headache, the severity, location and nature of the pain, the frequency, and duration of each attack if it is episodic in nature, premonitory and associated features, precipitating or relieving factors. A history of recent trauma should also be excluded amongst the other medical, psychiatric, family, social and drug histories. A thorough physical examination is important in as much as it serves to reassure the patient.

A history of episodic headaches is more usually in favour of a primary headache while a persistent headache may well be secondary to other pathology. After making the distinction between a primary headache and a secondary headache one could use 'blue flag' features and 'red flag' features in the evaluation of secondary headaches to help stratify the urgency

Table 1: Differential diagnosis of headache³

Headache	
Primary headache	Secondary headache
<p><i>Primary episodic headache</i></p> <ul style="list-style-type: none"> • Migraine • Episodic tension-type headache • Cluster headache and trigeminal autonomic cephalgia 	<p><i>Headache secondary to disorders of the:</i></p> <ul style="list-style-type: none"> • Skull (eg Paget's disease) • Ears (eg otitis media or externa) • Eyes (eg glaucoma, ocular strain) • Nose and nasal sinuses • Teeth • Cervical spine (eg cervical spondylosis) • Cranial nerves (eg herpes zoster)
<p><i>Primary frequent (chronic daily) headache</i></p> <ul style="list-style-type: none"> • Transformed migraine • Chronic tension-type headache • New daily persistent headache • Hemicrania continua 	<p><i>Headache secondary to:</i></p> <ul style="list-style-type: none"> • Intracranial vascular disorders (eg cerebral haemorrhage) • Extracranial vascular disorders (eg cranial arteritis) • Disorders of intracranial pressure (eg raised intracranial pressure or low cerebrospinal fluid pressure eg post-lumbar puncture leak) • Intracranial infection
	<p><i>Headache attributable to:</i></p> <ul style="list-style-type: none"> • General infection (eg influenza) • Medication (eg vasodilators) • Hypertension

of investigation and management. **Blue flag** features (Table 2) indicate secondary headaches that do not require urgent investigation. **Red flag** features require urgent attention (Table 3).³

*In determining the likelihood of secondary headache, the most crucial clinical feature to elicit is the length of the history. Patients with a short history require prompt attention and may need quick investigation and management. Patients with a longer history generally require time and patience rather than speed.*⁴ In the former scenario patients should be referred urgently to the hospital accident and emergency department. In the latter scenario one has the "luxury" to review, to assess progression and perhaps effect of treatment and then decide on further management which may include referral, imaging or even certain blood tests such as ESR.

A recent British medical journal editorial by Peter Goadsby addressed the question of when and whether to scan patients with headache. In the final part of his editorial Goadsby states that GP's are good at managing an open access system to brain imaging (as is the case in Australia).⁵

Primary headache syndromes

Primary headaches can be divided into two categories depending on the frequency and attack duration (Table 4):

1. Episodic headaches
2. 'Chronic daily' headache

The treatment of the headache depends on the diagnosis. An important aspect in management is that the diagnosis is explained carefully. It is important to take the beliefs the patient has regarding his headache into consideration and to discuss these with the patient. The management and treatment should be agreed with the patient to avoid non-compliance.

Migraine

In the case scenario quoted in the beginning, the likely cause of the headache is migraine. Two important aspects are to exclude intracranial pathology through a physical examination because of the side-locked location of the symptoms. The patient is also overusing analgesia which could lead to Medication Overuse Headache.

Migraine is usually defined (ICHD-II)⁴ as repeated attacks of headache lasting 4-72 hours that have these features:

- A: Normal physical examination
- B: No other reasonable cause for the headache
- C: At least two of the following:
 - unilateral pain
 - throbbing pain
 - aggravation of pain by movement or physical exertion
 - moderate or severe intensity of pain
- D: At least one of the following:
 - Nausea or vomiting
 - Phonophobia and photophobia

There is sometimes a visual aura of flashing lights, zig-zag constellations, balls or filaments of light. Many people with severe migraine find lying down in a dark room relieving.⁶

Why is migraine so important?

- It is common. However data is conflicting, possibly due to under- or over-diagnosis of migraine. A recent study quoted the prevalence of migraine as 25% in middle aged females.⁷ In addition it also affects children and is an important cause of school absenteeism. In an observational study, the prevalence of migraine in school children was quoted to be 10.6%.⁸ The prevalence of migraine seems to rise from puberty and peaks during late twenties and early thirties, affecting more females than males.
- It is a disabling condition. The World Health Organisation (WHO) considers that severe migraine can be as disabling as quadriplegia.⁴
- It increases the use of health services by patients.
- It has economic consequences to the individual and society.
- An issue which may come up during the consultation is the relation of migraine and stroke, possibly due to a similarity in presentation. Evidence is conflicting, but a recent meta-analysis suggests that there might be an increased risk of stroke in migraine sufferers, which risk is particularly raised in female migraine patients who use the oral contraceptive pill.⁹

Differentiating between migraine and tension-type headache

Trying to differentiate between migraine and tension-type headache is important, due to the high prevalence of headache in the community. Migraine is head pain with associated features while tension-type headache is a featureless head pain. The most important distinguishing associated features of migraine are nausea and vomiting, photophobia and phonophobia, though admittedly tension-type headache may be associated with these

Table 2: Blue flag headaches³

- Headache that is mainly occipital, but sometimes radiates to the temple, exacerbated by examination of neck mobility (cervicogenic headache or cervical spondylosis³)
- Headache temporarily linked to whiplash injury of the neck
- Headache related to reading (eye strain)
- Headache clearly temporally linked to the ingestion of medication eg vasodilators
- Headaches associated with systemic viral illness eg influenza

latter symptoms, especially nausea. Mild phonophobia and photophobia alone should not be used as exclusion criteria for tension-type headache.¹⁰

The other differentiating factor is that migraine has biological signatures while tension-type headache does not. Common precipitating factors of migraine which may help in the differentiation include stress and menstruation, however the evidence base for such claims is not so strong according to a meta-analysis by Bandolier.⁶ There is also a tendency for migraine to run in families, so one should enquire about any family history of migraine. In addition it may be useful to probe in the dietary habits of the patient and check for the relation of migraine to the intake of chocolate, cheese and aged wine.⁶

What do migraine patients want?

Patients want a treatment which acts quickly, relieves all pain, has little side effects and no recurrence. They want their doctor to be willing to answer questions, to teach them how to treat attacks, to educate them about the causes and how to avoid attacks, They want medical expertise and they also want understanding and empathy.

Table 3: Red flag headaches³

- Headache of sudden onset eg subarachnoid haemorrhage
- New onset headache in a specific setting eg metastases
- New headache that is persistently progressive
- Focal signs or symptoms (other than the typical visual or sensory aura of migraine) that precede or outlast the headache
- Headache with rash (may indicate meningococcal meningitis or Lyme disease)
- Persistent unilateral temple headache in adult life (may indicate cranial arteritis)
- Headache with a raised ESR (may be an indication of cranial arteritis, collagen disease, or systemic infection)
- Headache with papilloedema (raises the suspicion of raised intracranial pressure due to mass lesion or benign intracranial hypertension)
- Non-migraine headaches in pregnancy and post-partum
- Headache clearly triggered by changes in position (may indicate low cerebrospinal fluid, for instance due to spontaneous CSF leak)
- Headaches associated with pressing visual disturbance (may indicate conditions such as glaucoma or optic neuritis)
- Change in the nature of the headache in a chronic setting

Pathophysiology

In the 1960s and 1970s migraine was considered a vascular phenomenon and is still often referred to incorrectly as a vascular headache.⁴ However, brain imaging has suggested that the dorsolateral pons is pivotal in the phenotypic expression of migraine.

The clinical implication from this is that now doctors can be in a confident position to explain to their patients that their disorder is localised to the brain and it is normal for them to feel odd during attacks and have trouble concentrating. It also opens up new paths for treatment.

Treatment

1. Acute treatment for migraine

Two approaches may be taken.

- **Step up approach.** This means that treatment is progressively increased to more potent analgesics with each consultation for the same patient with the same complaint. This may lead to patient dissatisfaction and shopping around by the patient.
- **Stratified approach.** The severity of the attack is assessed and medication given proportionate to the symptoms with which the patient presents. If the attack is not so severe one might start with simple analgesics. If the attack is severe one may consider using a triptan immediately.⁶

Triptans, which are selective 5-HT_{1B/1D} receptor agonists, were the main advance in migraine treatment during the latter part of the 20th century. After sumatriptan, came zolmitriptan, naratriptan, rizatriptan, almotriptan, eletriptan and frovatriptan. Donitriptan has now finished preclinical development. Ergotamine has now few indications.⁴ These drugs come in various formulations (tablets and sprays) which is helpful in the acute setting.

Paracetamol, aspirin and NSAIDs (non-steroidal anti-inflammatory drugs) are commonly used to relieve pain also. Metoclopramide or domperidone should be considered if nausea is a prominent feature.

2. Preventive treatment in migraine

Approximately 5% of migraine sufferers will need preventive treatment due to the disabling nature of their headaches.¹¹ On average, two-thirds of patients will have a 50% reduction in headache frequency with most preventive drugs.⁴ Preventive drugs include beta-blockers, antidepressants, calcium-channel blockers, anticonvulsants and some other agents such as lisinopril and candesartan. The evidence base for these treatment varies, and whereas in the case of amitriptyline, propranolol and sodium valproate the evidence is robust, there is conflicting evidence as regards the use of verapamil.⁹ In fact the latter is considered by BASH (British Association for the Study of Headache) to have

little or uncertain efficacy.¹³ Recent and promising additions to this pharmacological armamentarium include lisinopril, candesartan and topiramate.

Beta-blockers

Propranolol is one of the most commonly prescribed drugs for migraine prophylaxis. From various studies it was found that propranolol is more effective than placebo in the short-term treatment of migraine. Propranolol is particularly indicated in patients who suffer from migraine and recurrent anxiety-induced palpitations. Evidence on long term effects is lacking.¹⁴ Regarding other beta-blockers such as atenolol, metoprolol and nadolol there is limited evidence to support their use in migraine prophylaxis.¹²

Antidepressants

Amitriptyline is a first-line agent for migraine prophylaxis and is the only antidepressant with constant evidence supporting its effectiveness in migraine prophylaxis.¹² Selective serotonin reuptake inhibitors (SSRIs) have been evaluated for the prevention of migraine and also tension-type headache but evidence is not so robust so far.¹⁵ Venlafaxine is occasionally used as second line therapy but evidence base is poor.

Anticonvulsants

Anticonvulsant drugs seem to be useful in clinical practice for the prophylaxis of migraine. They appear to be both effective in reducing migraine frequency and are reasonably well tolerated. Neither clonazepam nor lamotrigine was superior to placebo. Relatively few robust trials are available for agents other than sodium valproate/divalproex sodium. Two recently published and large trials of topiramate demonstrated reasonable efficacy.¹⁶ Topiramate (Topamax®) has been approved for the prevention of migraine.¹⁷

Shrader et al have shown that the angiotensin converting enzyme inhibitor, lisinopril, has a clinically important prophylactic effect in migraine.¹⁸

At present no one can reliably predict who are the patients that will respond to a particular medication. On the other hand individual patients were shown to have dramatic responses to various medications. A hands-on approach to dealing with this issue is to be guided by existing co-morbidities and patient characteristics in prescribing preventive treatment. For example, a female with hypertension would preferably be prescribed verapamil; a male patient who has an obsessive personality trait would benefit more from amitriptyline.

3. Complementary and alternative treatment

Most trials on complementary or alternative treatment indicate that these do not work.⁶

- Acupuncture - high quality trials showed that it is not effective.
- Chiropractice – limited evidence on how effective it is.

Table 4: Clinical features of primary headache syndromes³

Episodic Headache

• Migraine

- Female predilection
- Often commences in adolescence; presence of family history
- Associated visual, sensory, motor or cortical symptoms
- Unilateral throbbing headache
- Associated gastrointestinal symptoms of nausea and vomiting
- Associated photo- and phono-phobia
- Usually lasts 4-72 hours
- Often recurrent, predictable triggers

• Tension-type headache

- Female predilection not so prominent as in migraine
- Often begins in young adulthood or later
- Described as 'tight band-like pressing headache
- No features of gastrointestinal disturbance, photo- or phono-phobia; no aura
- Unusually not as incapacitating as migraine or cluster headache
- Usually lasts 30 minutes to 7 days

• Cluster headache

- Male predilection
- Severe, often excruciating pain; Unilateral with seldom side shift
- Location of pain typically behind the affected eye
- Usually lasts 15-180 minutes
- Ipsilateral autonomous phenomena
- Seldom has triggers (except for alcohol during a cluster)

Chronic Daily Headache

• Chronic Migraine

- Headache on more than 15 days per month
- History of migraine with gradual build-up of headache frequency until the headache becomes daily
- Features of migraine present
- Rarely, the migrainous features disappear, and only a chronic daily non-specific headache is left

• Chronic Tension-Type Headache

- Tension-type headache whose frequency increases until it becomes a daily headache
- Daily dull bilateral headache characterised by a pressing or gripping or band-like headache with no migrainous features

- Feverfew for migraine prophylaxis – some evidence suggests it works but more data is needed.
- Homeopathy for prophylaxis – no difference between homeopathy and placebo.
- Relaxation and biofeedback in paediatric headache – Probably as effective as other non-pharmacological interventions.

Conclusion

Doctors in general practice frequently encounter headache as a presenting complaint. Sometimes it will frustrate the family doctor especially if time is pressing and the waiting room is full of patients. Listening to the patient will give most information. Coupled with a good physical examination, the GP should be in a position to answer the two most important questions: is this a benign headache or one with sinister pathology? Is it migraine or tension-type headache? Adequate history taking allows appropriate gauging of severity of symptoms so that treatment can be tailored accordingly.

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