An Approach to A Case of Headache

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Abstract
Headache is the most common clinical problem in practice. It affects 90% of the population at some point in their lives. The disorder is seventh most common chief complaint in general practice. It is of paramount importance to go into the details of history in a patient of headache, before he is put to unnecessary investigations. A detailed history of the quality, severity, location, duration, and the conditions which produce, exacerbate or relieve is of importance. A good clinical history would give the diagnosis of headache in majority of cases and would save the patient from unnecessary investigations. In this article the authors discuss the bedside approach to a case of headache, with greater emphasis on history and clinical symptoms.

Introduction
Headache is the most common clinical problem in practice. It affects 90% of the population at some point in their lives. The disorder is seventh most common chief complaint in general practice and costs society more than $13 billion annually.

It is of paramount importance to go into the details of history in a patient of headache, before he is put to unnecessary investigations. A detailed history of the quality, severity, location, duration, and the conditions which produce, exacerbate or relieve is of importance. A good clinical history would give the diagnosis of headache in majority of cases and would save the patient from unnecessary investigations. Many headaches are due to medical rather than neurological disease, yet always there is a suspicion of intracranial disease, hence the problem of headache is of legitimate concern to the general physician. The face and the scalp are more richly supplied with pain receptors, in order to protect the skull, and that is why so many pains are centred in and around the head. The nasal and oral passages, the eye and the ear are highly sensitive structures which require protection and are capable of inducing pain in their own way.

Pathophysiology of Primary Headache
Current understanding of headache pathogenesis has moved beyond earlier theory that headaches are strictly vascular (migraine) or muscular (tension) in origin.

1. Trigeminovascular stimulation: Recent studies support the view that stimulation of trigeminovascular system causes most headaches. Peripheral stimulus activates the nerves entering the trigeminal nucleus caudally lowering the threshold of its activation. This process is referred to as central sensitization. Low levels of serotonin lead to central sensitization with multiple effects including release of vasodilator neuropeptides such as substance P and calcitonin gene related peptide (CGRP). Dilatation of meningeal vessels causes tension...
and stretching of nerves surrounding the blood vessels which produce pain.

2. Lowered stimulation threshold can directly stimulate trigeminal nerve and this explain symptoms such as auras (V1 branch), pain and pressure (V2 branch and TMJ (V3 branch).

Convergence theory: It hypothesizes that one theory exists for primary headaches. The theory suggests that difference in primary headache depends on how far is pathologic process the headache proceeds and to what degree the trigeminal system activated before being dampened by brains homoeostatic mechanisms. After reviewing the historic differentiation between migraine and tension-type headache, the similarities between these two types of primary headaches outweighs the differences, and so the hypothesis that these headaches share a common pathophysiology. The convergence hypothesis for primary headaches links the clinical features of an evolving headache to current pathophysiological models. The successive symptoms experienced clinically reflect an escalating pathophysiological process, beginning with the premonitory period and progressing into tension-type headache and, if uninterrupted, finally into migraine. The clinical manifestations of other headache types, such as so-called sinus headache or temporomandibular headache, the similarities between these two types of primary headaches outweighs the differences, and so the hypothesis that these headaches share a common pathophysiology. The convergence hypothesis for primary headaches links the clinical features of an evolving headache to current pathophysiological models. The successive symptoms experienced clinically reflect an escalating pathophysiological process, beginning with the premonitory period and progressing into tension-type headache and, if uninterrupted, finally into migraine. The clinical manifestations of other headache types, such as so-called sinus headache or temporomandibular headache, may also be explained by this model. A convergence hypothesis for primary headaches has important implications for earlier recognition, diagnosis, and treatment.

3. Other aetiologies: Other factors that have been associated with headache aetiology include oestrogen, genetics, environmental and behavioural factors: some authorities believe that the oestrogen is associated with headache especially migraine because intensity and frequency increases after puberty and decreases after menopause.

4. Genetics: If both parents have migraine then more than 75% chance of child having it compared to children whose parents don’t have it. Even if distant relative is suffering from migraine, they have 20% increased migraine risk.

Finally environmental and behavioural factors can trigger headache.

The headaches of cervical arthritis are most typically intense after period of inactivity and the first movements of the neck are stiff and painful. Hypertensive headache and Tumour headache occur in the morning. Excitement and tension may provoke them. Headache of sinuses is worsened by stooping and changes in atmospheric pressure. Eye strain headache follow prolonged use of eyes. Alcohol, tension, exercise and coughing are known to initiate a bursting headache lasting for a few seconds to minutes. If the headache is made worse by coughing or straining, an intracranial source is suggested. Anger, excitement can initiate migraine.

What Causes Head Pain?

A. Pain sensitive structures-

1. Intracranial
   a. Pain sensitive
      Cranial sinuses and afferent veins.
      Arteries/veins of the dura mater.
      Arteries of the base of the brain and their major branches.
      Parts of the dura mater (in the vicinity of large vessels).
   b. Pain insensitive
      Parenchyma of the brain.
      Ependyma, choroids plexus

Mechanisms of Headache

1. Traction on and dilatation of the intracranial arteries and distention of extracranial arteries.
2. Traction on, or displacement of large intracranial veins or the dural envelopes in which they lie.
3. Compression or traction on or inflammation of sensory cranial and spinal nerves.
4. Voluntary or involuntary spasm and possibly interstitial inflammation of cranial and cervical muscles.
5. Meningeal irritation and raised intracranial pressure.

Principal Varieties of Headache

The international headache society (IHS) has developed a system classifying all headaches into two broad types: primary and secondary.

Primary headaches are divided into three categories: Migraine, Tension type, and Cluster. They are due to primary genetic predisposition and start in response to trigger factors or just occur spontaneously.

Secondary headache is due to some definable condition such as brain tumour or increased intracranial tension etc.

Migraine

It is a familial disorder characterized by periodic, commonly unilateral, throbbing headache which begins in childhood, adolescence or early life and recurs with diminishing frequency during advancing years. Two syndromes are identified.

a) Typical migraine (classic)

b) Atypical migraine (common) twice as frequent as typical one.

The typical syndrome is ushered in by disturbance of neurological function, most often visual, followed in few minutes by hemispheric or occasional bilateral headache, nausea and vomiting. The headache is moderate to severe in intensity, lasting 4-72 hours. They are made worse by activity and almost always disrupt the patients’ normal activities of daily living (ADL).

Other associated symptoms are photophobia and phonophobia. The atypical syndrome is characterized by a hemispheric or general headache, without aura, without nausea and vomiting. Typical migraine has its onset soon after awakening but may occur at any time of day. Though typically hemispheric (but can be bilateral also) the pain may be frontal, temporal or generalized. Any one of the three principal components: neurological abnormality, headache or vomiting may be absent. With advancing age there is tendency for headache and vomiting to become less severe. The uncommon varieties of migraine are basilar artery migraine or vertebro-basilar migraine, ophthalmologic migraine and hemiplegic migraine. A vexing clinical problem of status migrainus—that is continuous headache. The pain is unilateral, throbbing and disabling.

Cluster Headache

It occurs predominantly in young adult men and is characterized by a consistent unilateral orbital localization. It tends to recur in the night or several times during the night and day for a period of 2-8 weeks, sometimes much longer, followed by complete freedom for many months or even years (hence the name cluster). The unilateral pain is often described as stabbing and persists for 15-180 minutes. A considerable number of patients could be chronic over years. The pain is felt deep and around the eye, is intense and non-throbbing in nature as a rule, and often radiates to the forehead, temple and cheek.

Associated phenomenon are ipsilateral including a blocked nostril followed by rhinorrhea, injected conjunctiva, miosis or ptosis or eyelid oedema and less often nausea and vomiting. During an attack the patients are often restless or markedly agitated. The
headache is usually followed by fatigue. If a second cluster of headaches follows the first, the patient is said to have chronic cluster headache. However if headaches go in remission within a year of first cluster the diagnosis is episodic cluster headache. The picture of cluster headache is usually so characteristic and hence can not be confused with other causes. The relationship of cluster headache to migraine headache remains conjectural. Certain headache have features of both and hence name “cluster migraine”.

**Tension Headache**

These are mild to moderate in intensity and usually do not affect the usual daily activities, hence patients don’t present in clinic with this headache. It is bilateral, often with occipital, nuchal, temporal or frontal predominance, or with diffuse extension over the top of cranium. The pain is described as full aching but feeling of fullness, tightness, or pressure is described. It persists for years or months. The sleep is undisturbed and has no diurnal variation. Tension headache can last 30 minutes or they can occur continuously for days, in which case the condition is referred as chronic daily headache. Tension headaches are usually not associated with additional symptoms such as nausea and vomiting.

**Secondary Headaches**

**Post Traumatic Headache**: Severe chronic, continuous or intermittent headaches appear as a cardinal features of several post traumatic syndromes, separable in each instance from headache that immediately follows head injury i.e. that of scalp laceration and cerebral contusion with blood in CSF and increased intracranial pressure) and that lasts for days or a week or two. Often the headaches do not resolve unless oedema surrounding the injury resolves.

**Headache of Brain Tumour**: Headache is a significant symptom in about two-third of all patients with brain tumour. Unfortunately the quality of pain has no specific features. It tends to be deep seated. Non-throbbing (or throbbing), and is described as aching or burning. Attacks last a few minutes to an hour or more and occur once or many times during the day. Activity and frequent change in position of the head may provoke pain. Although this is typical, but by no means diagnostic. Unexpected forceful (Projectile) vomiting may punctuate the illness in its later stages. The pain is often on side of tumour and a change to bioccipital usually signifies increased intracranial tension.

**Temporal Arteritis**: This particular type of inflammatory disease of cranial arteries is an important cause of headache in elderly persons. Most of the patients are over 60 years. From a state of normal health they develop an increasingly intense throbbing or nonthrobbing headache, bilateral or unilateral often localized to the affected arteries, which persists throughout the day and is particularly severe at night. It lasts for several months if untreated. The superficial temporal and other scalp arteries are frequently thickened and tender and without pulsation. The erythrocyte sedimentation rate is frequently raised. An elevated C- reactive protein may be helpful to diagnose it. Other associated symptoms and signs may include polymyalgia rheumatica, anaemia, and weight loss. The importance of this headache is that it can lead to blindness due to arteritis of the cilioretinal artery, central retinal artery or the ophthalmic artery. Diagnosis is made by temporal artery biopsy and treatment is immediate steroid therapy.

**Headache of Meningeal Irritation**: (Meningitis, Subarachnoid haemorrhage).
Subarachnoid haemorrhage causes a sudden onset, very severe headache which patient describes as the ‘worst headache of my life’. The headache is associated with neck stiffness and rigidity and Kernig’s and Brudzinski’s signs may be elicited.

**Kernig’s sign:** with patient supine, flex hip to 90 degrees with knee flexed. When knee is extended pain will be produced in the back of neck.

**Brudzinski’s sign:** passive flexion of neck induces involuntary hip flexion.

In both the above conditions there is also a clear indication to CNS involvement like altered level of consciousness, vomiting, pupillary changes, photophobia.

**Headache and Craniofacial Pain with Psychiatric Disease:** Majority of these cases are anxiety neurosis, obsessive compulsive neurosis, depressive illness, hysteria with complains of headache of tension type. As a corollary, psychological studies of groups of patients with tension headache have revealed prominent symptom of anxiety and depression. In out patient clinic, the some times the cause of generalized intractable headache, instead of significant intracranial disease is depression and anxiety in one of it several forms.

**Headache Related To Medical Diseases**

About 50 per cent of patients with hypertension complain of headache, but the relationship of one to other is not entirely clear. Minor elevations of blood pressure may be a result rather than the cause of tension headaches. Severe hypertension, with diastolic pressure of more than 120 mm Hg, is regularly associated with headache and measures that reduce the blood pressure relieve the headache. However it is the moderately severe hypertensive individual with frequent severe headaches who give the most concern. In many of these patients there is undoubtedly an underlying anxiety or tension state or a common migraine syndrome, but in some the headaches defy explanation. According to Wolff, the mechanism of the hypertensive headache is similar to that migraine i.e. increased vascular pulsations.

The headaches that accompany diseases of the upper cervical spine are well recognized but their mechanism is obscure. Recent articles have focused on the wide range of aetiologies such as zygoapophyseal arthropathy, calcified ligamentum flavum, lesions of the posterior longitudinal ligament and rheumatoid arthritis of the atlanto-axial region. CT scanning can identify a number of these abnormalities.

**Sinus Headache**

Pain is frequently localized over the sinuses and associated with nasal discharge. This often presents in the morning and disappears with an upright posture and may increase in stooping position. Many patients complain that they have a sinus headache when they actually have migraine headache.

**History**

History is the single most important clue to the diagnosis of any headache condition since the examination is usually normal. Physical examination of the head itself is seldom useful. Applying findings, history and examination to obtain a diagnosis for a type of headache may not be as straightforward as it appears. Patient’s description of quality of the pain, is rarely useful. Most headaches, regardless of type, tend to be dull aching and not sharply localized, as it usually the case with disease of structures deep to the skin.

The useful descriptions of the pain are lightness, pressure, bursting or stabbing. It is worth going into details if the headache
throbs with each arterial pulse, indicating a vascular origin. Intensity of the pain should be accepted with caution. The degree of incapacity is a better index, especially if the patient is not prone to illness. As a rule the most intense clinical pains are those go with subarachnoid haemorrhage, meningitis, which has grave complications as compared to migraine, cluster headache which do not.

Location of the pain gives the clue many times. Inflammation of the extracranial artery causes pain localized to the vessel. Intracranial lesion in the posterior fossa cause pain in the occipito-nuchal region, homolateral if the lesion is one sided. In supratentorial lesion pain is in frontoparietal region, again homolateral to the lesion. Localization may be deceiving at times, pain in the frontal region may be due to glaucoma, sinusitis, thrombosis of the basilar artery, or increased intracranial pressure. Ear disease may have referred pain to head.

The mode of onset, time intensing curve and the duration of headache are also useful data. The headache of subarachnoid haemorrhage occurs in a single attack and attains its maximum severity in a matter of minutes. In bacterial meningitis, it may come more gradually over several hours associated with changes in level of sensorium and vomiting. Bright sharp pain lasting for a few seconds in the eye or cranium is more common in migraine. Migraine of the classical type, starts in the early morning hours or daytime, reaches its peak in half an hour and lasts for 1-2 days. In contrast to the night occurrence of unilateral temporo-occipital headache pain, 2-3 hours after falling asleep, over a period of several weeks to months is typical of cluster headache. The headache of raised intracranial pressure may come at anytime of day or night may interrupt sleep and lasts for few minutes or even longer. In general, the headaches that have recurred regularly for many years prove to be vascular or tension in type. Tension headache may persist, with varying intensity for weeks to months or even longer.

The relationship of headache to certain biologic events and certain precipitating or relieving factors must always be noted. Headache that occurs in the premenstrual period could be due to the premenstrual tension and also attacks of migraine occur at this time.

There are four histories to take from patients who have headache.

A) Family history: Determines if the patient is genetically headache prone.
   - Ask if the patient’s mother, father, sister, brother ever had a headache.
   - Sinus headache many times turns out to be recurrent migraine.

B) The life history: Determines what has happened with headaches over a person’s life.
   - Was there car sickness or night terrors as a child (frequent associations to migraine).
   - Was there episodic nausea or abdominal pain as a child (another kind of migraine in child)
   - When did the migraine start (adolescence is a frequent starting point). When in the life did they get worse: patients with life Stressors (marriage, death of a relative, arrival of a new baby, house shifting) make underlying headache worse. Have the headaches changed over time.

C) The attack history: Since many people have more than one kind of headache it is important to record events of each headache type.
Is this a new headache or an old headache (new headaches need to be closely scrutinized which may signal a secondary cause).

- What kind of warning signals are there: 'Auras' are frequently neurological symptoms occur before an attack of migraine (e.g. visual spots, lights, wavy vision, spark, flashes, zigzag lines, heat . . . wave sensation, numbness, weakness, vertigo, fatigue and yawning).
- Where is the headache? (unilateral, bilateral, holocranial).
- How frequently does it occur?
- How long does it last? (hours, days, weeks).
- What type of pain is it? (Dull, ache, throbbing, jabbing, burning, ice-pick).
- When does it occur? (a.m, p.m, awaken from sleep).
- How does it come on? (Sudden onset, gradually and builds up)
- What are the associated symptoms? (Nausea, vomiting, photophobia, lacrimation, red eye, stuffiness of nose).
- What factors bring it on? (Diet, stress, menstruation).
- What factors relieve the headache? (Bed rest, dark room, medication, vomiting, placing ice packs).
- What are aggravating factors? (Movement, lack of sleep, sunlight, position changes).
- How does it leave? (Suddenly, gradually).

D) Medical history that affect, cause headaches:
- Medical considerations: COPD, thyroid diseases, Anaemia, Hypertension.
- Medications: prescriptions, non-prescriptions; especially over the counter pain killers like aspirin or acetaminophen can cause rebound headache; Medications with sympathomimetics may increase headache; Drug abuse (cocaine, amphetamine) all can cause headache.
- Psychiatric co-morbidities (sexual, physical, other)
- Depression; anxiety all are associated increased headaches

Physical Examination and Neurological Examination

A. General examination should include a thorough examination of head and neck areas, cervical spine, tender temporal arteries, bony swellings, TM joint pain, local/local tenderness.
B. Blood pressure.
C. Ocular Fundus- R/O papilloedema and look for spontaneous venous pulsation.
D. Neurological examination should be completely normal in primary headache disorders.

Red Flags

A. When to suspect secondary disorders that require further laboratory investigations:
1. Unexplainable and abnormal worsening of previously existing migraines.
2. Dramatic or unusual change in character of the prodrome or the previous headache.
3. Headaches awakening the patient in the middle of the night (provided it is not a cluster headache).
4. Headaches much worse when recumbent or with coughing, sneezing, valsalva.
Red flags for secondary headaches

- Age < 5 years.
- Age > 50 years.
- Increasing frequency of Headache.
- Increasing intensity of Headache.
- Jaw claudication.
- Motor or cognitive changes.
- Stiff neck, fever, malaise.
- “Worst headache ever.”

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ADVANCING CARE FOR ACUTE HEART FAILURE - NO TIME TO RELAX
In The Lancet today, John Teerlink and colleagues report the results of a randomised phase II trial (Pre-RELAX-AHF) of a new vasodilator, relaxin, in patients with normal or high blood pressure admitted to hospital with heart failure. The results are probably too good to be true, in view of the lack of a dose-dependent effect and the surprising effect of a short treatment on postdischarge outcomes, including 180-day cardiovascular mortality.

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