Review article:

Differential diagnosis of headache in adults

Dr. Niketh Desouza

M.B.B.S., Private Practitioner
Court View, 33 Nesbit Road, Mazgaon, Mumbai, India

Abstract
Headache, also known as cephalalgia, is a pain in any region of the head or upper neck. According to statistics approximately 64-77% of people will experience a headache at some point in their lifetime and in a year 46-53% of people will experience a headache\(^1\). They can be unilateral or bilateral and radiating or non-radiating. The pain can be described as sharp, dull, throbbing or as an aching sensation. Headaches can last anywhere between less than an hour to a few days and can be sudden or gradual in onset. Headaches can be classified as primary or secondary where the latter is caused by an underlying process such as an infection, tumour, haemorrhage or vasculitis. Primary headaches are usually benign and do not pose any significant danger to life or health whereas secondary headaches can be harmless or dangerous depending on their cause. Accurate diagnosis and appropriate therapy is required as chronic headaches can lead to a significant decrease in the patient’s quality of life, social interactions, efficiency at work and a few secondary causes of headache can lead to significant morbidity and mortality if prompt treatment is not given.

Keywords: Headache, tension headache, migraine, cluster headache.

Introduction
Headaches are one of the most common complaints in medicine. Most headaches (90%) are primary in nature\(^2\). Primary headaches consist of migraines, cluster headaches and tension headaches. These can present with headache in addition to symptoms such as photophobia, nausea, vomiting, rhinorrhea, redness and tearing of the eye. There are certain lifestyle factors which can trigger primary headaches such as red wine, stress, certain foods, caffeine and menstruation.

Some of the causes of secondary headaches are acute sinusitis, concussion, ear infection, encephalitis, giant cell arteritis, intracranial hematoma, pseudotumourcerebri and trigeminal neuralgia. A good clinical history and physical exam can usually lead to the diagnosis, however in some cases further imaging studies, labs and lumbar puncture maybe needed to exclude more dangerous underlying causes of the headache.

I. Primary Headache.
A) Migraine
Migraine is a severe recurring headache which is unilateral (60% of the time) and generally accompanied by nausea, photophobia and phonophobia\(^3\). In American, 12-16% of people experience migraine headaches. About 70% of patients have a first degree relative with a history if migraine headaches. Migraines usually start at puberty and worsen during middle age. About 15-30% of patients can report having symptoms or warning signs prior to the onset of the headache. This is known as migraine with aura and its manifestation include changes in vision, zigzag lines, flashes of light, scotoma, abnormal smells and numbness in the extremities. They can last from 5-20 minutes with the headache beginning after the aura stops. Migraines can have various triggers such as menstruation, birth control, stress, caffeine and cheese. Migraines usually last from 4-72 hours with 2/3 of females reporting symptoms
for more than 24 hours. Patients are symptom free between attacks. Patients will typically present with a headache which is throbbing or pulsatile in nature with increasing severity over 1-2 hours. Pain can be aggravated by movement, exposure to light or physical activity and alleviated to some extent by keeping the patient in a dark quiet room. Pain can gradually subside on its own after a period of time or sleep. Migraines are commonly accompanied by nausea, vomiting, anorexia and food intolerance. Photophobia and phonophobia may also be present. Other neurologic changes that can be observed include hemiparesis, aphasia, confusion and numbness. The physical exam will be normal in most patients however a complete neurological exam should be done to exclude other causes of secondary headache. Diagnosis is usually clinical however a head CT or MRI should be done in cases associated with focal neurologic abnormalities, those presenting after 40 years of age or headaches which are sudden and or severe in nature. The treatment of acute migraine consists of abortive therapy which includes NSAIDs, acetaminophen, triptans, ergotamines and antiemetics. A large single dose usually works better than repetitive smaller doses. When 4 or more headaches occur within a month the patient should be given prophylactic therapy with beta blockers. Alternative medications include calcium channel blockers, tricyclic antidepressants and SSRIs. Patients should be educated about their condition and encouraged to participate in their management by avoiding triggers, lifestyle modifications and the use of prophylactic medications if required. Even though migraine headaches are usually a benign condition it can rarely be associated with complications. Migraine with aura is said to double the risk of ischaemic strokes and can be associated with cervical artery dissection. The four main patterns of the disease are that symptoms may resolve completely, symptoms may decrease in severity, symptoms may remain the same or symptoms may worsen

B) Cluster Headache

A cluster headache is one in which the pain is severe, unilateral and usually around the eye. They are 10 times more common in men than in women. They are often accompanied by neurologic symptoms such as rhinorrhoea, redness and tearing of the eye. They affect about 0.2% of the general population and usually begin between 20 to 50 years of age. The patient will usually experience an episode one to three times a day during a certain period of time (cluster period). The cluster period is generally from 6 to 12 weeks. Cluster headaches usually last between 15 minutes to 3 hours duration. Most attacks last less than 60 minutes. There are no warning signs or aura as in migraines. Some of the risk factors for cluster headaches are male sex, alcohol use, age above 30 and surgery or previous trauma to the head. The pathophysiology of cluster headaches is not fully known however pressure on the trigeminal nerve has been implicated in its etiology. The patient typically presents with excruciating unilateral pain which is described as sharp, burning or penetrating. The pain can be temporal, orbital or supraorbital and can radiate. The attacks are associated with excessive tearing and redness of the eye, rhinorrhoea, nasal congestion, periorbital edema and diaphoresis around the facial region. A good clinical history and physical examination should be done as cluster headaches are often misdiagnosed as either migraines or other forms of primary or secondary headaches. There is no confirmatory or radiologic test which can be done to aid in its diagnosis. The best initial (abortive) therapy in an acute attack is 100% oxygen or triptans. Steroid may also be used. Verapamil (calcium channel blocker) can be used as prophylactic therapy. However the problem with
giving prophylactic therapy is that the cluster period is usually over by the time the therapy has taken effect. The outcome of cluster headaches is that there can be lifelong recurrent attacks or prolonged remission. There is no reported mortality directly associated with cluster headaches and this is a benign condition.

C] Tension Headache

A tension headache is a diffuse, mild to moderate pain around the head, scalp or neck and is associated with muscle tightness. Tension headaches are the most common type of primary headaches. Tension headaches are present in 20% of the population and more prevalent in women (23%) than men (18%). Yearly prevalence is approximately 80% for men and women and is one of the leading reasons for buying over the counter analgesics. Tension headaches are bilateral and typically last 4-6 hours but can last from minutes to days as well. It can be episodic (less than 15 days a month) or chronic (more than 15 days a month). Some of the precipitating factors of tension headaches are stress, bad posture, decreased sleep, eyestrain and hunger. Pathophysiology is thought to include both psychogenic and muscular factors. Patients present with dull head pain which is described as mild to moderate in severity, pressure around the head and tenderness around the scalp and forehead. Diagnosis is clinical and can be differentiated from migraine and cluster headaches by the lack of accompanying symptoms like nausea, vomiting, photophobia and rhinorrhoea. Treatment includes over the counter analgesics such as acetaminophen, ibuprofen and aspirin. Prescription medication like ketorolac and indomethacin can be given to those who do not respond to over the counter medications. Prophylaxis with tricyclic antidepressants (amitriptyline), SSRI’s and mirtazapine can be given to those who have chronic type of tension headache. Biofeedback methods have also been used. Lifestyle modifications and relaxation techniques like yoga, massage and exercise can be implemented as well. The patient should be counselled against overmedication as this can lead to rebound headaches and various medication associated side effects. The prognosis is good as tension headaches respond well to analgesics and is not harmful. However due to its chronicity it can cause significant disability to many patients.

II] Secondary Headache

The pain can be originate in areas other than the neck or head. Some can be benign while others more serious. Below we will discuss some of the causes of secondary headaches.

a) Meningitis

Meningitis is a serious, acute condition in which there is an inflammation of the meninges surrounding the brain. The most common presenting symptoms of meningitis are headache, fever and neck stiffness. In addition to this there can be nausea, vomiting and photophobia. When a diagnosis of meningitis is seriously considered a lumbar puncture should be performed for examination of CSF. If focal neurologic abnormalities are present, a CT scan should be done before lumbar puncture, however antibiotics should be administered immediately in this case.

Meningitis has a high mortality rate if there is delay in treatment or if left untreated.

b) Intracranial Haemorrhage

An intracranial haemorrhage is bleeding within the skull. It can be due to trauma or a ruptured aneurysm. Patient presents with severe headache and neurologic abnormalities such as weakness, tingling or paralysis of parts of the body. Diagnosis is via CT scan. According to the location and extent of the bleed urgent surgical or medical intervention may be required.
c) **Space occupying intracranial lesion**
A brain tumour is a collection of abnormal cells in the brain. Patients can be asymptomatic or present with symptoms of increased intracranial pressure (headache, nausea, vomiting), seizures or other neurologic dysfunctions depending on the tumour location. Radiologic imaging (MRI) plays a central role in the diagnosis of brain tumours however a definitive diagnosis can only be made by histologic examination of the tissue sample.

d) **Temporal Arteritis**
Temporal arteritis is a condition in which the temporal arteries become inflamed or damaged. It is also known as giant cell arteritis. It is associated with polymyalgia rheumatica. There can be jaw claudication, scalp tenderness and changes in vision. An ESR level should be obtained immediately when temporal arteritis is suspected and treatment with steroids initiated if the level is elevated. This is because temporal arteritis can cause occlusion of the ophthalmic artery and lead to permanent blindness. Definitive diagnosis is made by biopsy of the temporal artery.

e) **Acute closed angle glaucoma**
Acute closed angle glaucoma occurs when there is a sudden increase in intraocular pressure caused by a build-up of aqueous humour in the eye. Patient will present with sudden ocular pain, reduced or changed vision and a fixed midpoint pupil. Diagnosis is clinical and the best initial treatment is acetazolamide, a topical beta-blocker, and a topical steroid drops. Iridotomy is usually the definitive treatment.

f) **Acute Sinusitis**
Acute sinusitis is an inflammation of the nasal sinuses. It can be due to allergies, infection or pollution. Most cases are viral. Symptoms include headache, facial tenderness, nasal discharge and toothache. Acute sinusitis is a clinical diagnosis but imagining studies like x-ray and CT can be done in complicated cases. The most accurate test is sinus aspirate for culture. Since most cases are of viral etiology antibiotics are not routinely recommended unless symptoms do not resolve within 10 days. In that case amoxicillin can be prescribed.

**Conclusion**
Headaches affect half of the adult population worldwide. A thorough clinical history and physical exam can reduce the need for unnecessary and invasive tests like neuroimaging, lumbar puncture and other studies. However in cases where the physician comes across certain red flag signs and symptoms which signify an underlying pathology, further testing should be done.

**References**
5. Global Burden of Disease Study 2013 Collaborators. “Global, Regional, and National Incidence, Prevalence, and Years Lived with Disability for 301 Acute and Chronic Diseases and Injuries in 188 Countries, 1990-2013: A


