HEADACHES

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Introduction

Definition: A headache is pain or discomfort in the head, scalp, or neck region and it is actually a symptom rather than a disease. A stress response, vasodilation,skeletal muscle tension, or a combination of factors. It can vary widely in intensity, duration, and location.

Severe Headaches: Studies indicate that roughly 20–25% of adults experience a severe headache (such as migraines or tension-type headaches) in a given year.

Chronic or Daily Headaches: Estimates suggest that around 4% of the adult population suffers from chronic daily or near-daily headaches.

It’s widely reported that by some estimates, up to 90% or more of people will experience a headache at some point in their lifetime.

These numbers underscore the significant personal and economic impact of headache disorders, which contribute to lost productivity, healthcare expenses, and a reduced quality of life.

Clinical Assessment

It is of utmost importance when a patient comes to our practice to be assessed very carefully especially when it's their first time complaining of any type of headache. Medical history, thorough anamnesis, comorbidities, and clinical evaluation.

*Always look for potential red flags!

Clinical Assessment

01

Physical Examination

Systematic check and look for signs that can potentialy alter the initial diagnosis

02

Vital signs

Blood pressure, ECG, Body temperature, Respiration Rate

03

Neurological Examination

Full neurological examination

04

Diagnostic Procedures

Next steps in diagnosis (CT, MRI, Complete laboratory analysis, Lumbar Puncture)

Headaches Classification

Primary

- Tension Headache
- Migraine
- Cluster Headache
- Other Trigeminal Autonomic Cephalgias (paroxysmal hemicrania and SUNCT/SUNA)

Secondary

- Post traumatic headache
- Sinus headache
- Medication overuse headache (Rebound Headache)
- Headache attributed to intracranial disorders
- Headache Due to Infection or Systemic Illness (Flu, fever, meningitis, encephalitis)
- Cervicogenic Headaches (e.g neck related and cervical spine disorders
- Headaches atributed to vascular disorder (SAH, temporal arteritis, Stroke)

Primary Headaches

A headache that is not caused by another underlying disease, trauma or medical condition. These account for about 90 % of all headaches.

Tension Headaches

01

This is the most common type of all primary headaches.
Often related to stress, poor posture or muscle tension.
It has gradual onset less in the morning increases as day goes on and characterises as mild-to-moderate pressure or tightness around the head, billateral dull aching head pain (band-like tightness). Tenderness around the scalp, neck, and shoulder muscles. Usually there is no nausea or vomiting. Can last from 30 minutes to several days. If it occures more than 15 days per month for three months it can be classified as chronic. The most common triggers are stress (work, school, personal), muscle strain from prolonged computer use or poor posture, sleep deprivation or irregular sleep patterns and sometimes due to dehydration.

* It’s distribution can vary “headband like”, “like a helmet”, just the temporal region, just the back of the head or even iradiate down to the neck.

Treatment

Acute Treatment

- **First-line options:**
- NSAIDs (e.g., ibuprofen 400 mg, naproxen 500 mg)
- Acetaminophen (Paracetamol) 1000 mg
- Aspirin 500–1000 mg
- Lifestyle changes
- **Second-line options:**
- Combination analgesics (e.g., aspirin + caffeine, acetaminophen + caffeine)
- Muscle relaxants

Limit acute treatments to ≤2 days per week to avoid medication-overuse headache (rebound headache).

Propxylactic Treatment

- **First-line preventive medications:**
- Amitriptyline (10–75 mg at bedtime) – most effective, but causes drowsiness.
- Nortriptyline (10–50 mg at bedtime) – alternative with fewer side effects.
- Lifestyle changes
- **Second-line options:**
- Venlafaxine (75–150 mg/day) – if amitriptyline is not tolerated.
- Gabapentin (300–1200 mg/day) or Topiramate (25–100 mg/day) – less evidence but may help.

Treatment duration: At least 3–6 months before considering tapering.

Migraine

02

Migraine is the second most common headache disorder (around 16%) after tension-type headache. Global prevalence of migraine is estimated at ~14–16% of the population with prevalence in women (15%) and Men (6%) Migraine is more common in women than men due to hormonal influences (Like catamenial migraine). There is migraine with aura (20-25%) and without aura.

It's characteristics are: Severe, episodic, unilateral, throbbing pain with moderate to severe intensity, lasting 4–72 hours. The pain is often unilateral (one side of the head) but can shift. Movement worsens symptoms. Nausea, vomiting, photophobia (light sensitivity) and phonophobia (sound sensitivity) are hallmark symptoms. Osmophobia (sensitivity to smells) can also occur.

Aura symptoms are mostly visual (Flashing lights, silvery zigzag lines moving across visual field over a period of 20 minutes), sometimes leaving a trail of temporary visual field loss. Less common are Auditory ,Olfactory, gustatory hallucinations, sensory aura-spreading front of tingling and numbness, from one body part to another

Migraine Patophysiology

02

Few theories have bees sugessted:

Cortical Spreading Depression (CSD): Wave of **neuronal depolarization** spreads across the cortex. Triggers **aura** and activates **trigeminal nociceptive pathways**.

Trigeminovascular System Activation: CSD activates trigeminal nerve, releasing: Calcitonin Gene-Related, Peptide (CGRP), Substance P, Neurokinin A wich cause neurogenic inflammation, vasodilation, and pain.

CGRP and Pain Transmission: CGRP is a key mediator in migraine pathophysiology. Leads to vigorous vasodilation and increased blood flow in the cerebral and meningeal arteries and sensitization of pain pathways.

Central Sensitization: Repetitive stimulation leads to hypersensitivity to pain, worsening migraine over time.

Role of Serotonin (5-HT): Low serotonin levels lead to dilation of cranial blood vessels. Triptans act by stimulating 5-HT1B/1D receptors, reversing vasodilation and inhibiting CGRP release.

Migraine has a strong genetic component: First-degree relatives of migraine sufferers are 2–3 times more likely to have it. Familial Hemiplegic Migraine (FHM) is a rare genetic subtype with known mutations in CACNA1A, ATP1A2, and SCN1A genes.

Treatment

Acute Treatment

- **First-line options:**
- ***Mild to moderate migraine:*** NSAIDs (e.g., ibuprofen 400–600 mg, naproxen 500 mg) Acetaminophen (Paracetamol) 1000 mg Aspirin 900–1000 mg Combination analgesics (e.g., Excedrin: aspirin + caffeine + acetaminophen)
- ***Moderate to severe migraine or NSAID failure***:
- Triptans (sumatriptan, rizatriptan, eletriptan) Ergotamine derivatives, (dihydroergotamine),
- Anti-nausea medications (metoclopramide, domperidone), Corticosteroids (rare, e.g., dexamethasone, for status migrainosus)
- ***Severe attacks or emergency settings:***
- IV fluids + IV ketorolac/metoclopramide
- IV dihydroergotamine or IV triptans
- CGRP receptor antagonists (new class, e.g., rimegepant, ubrogepant)

Propxylactic Treatment

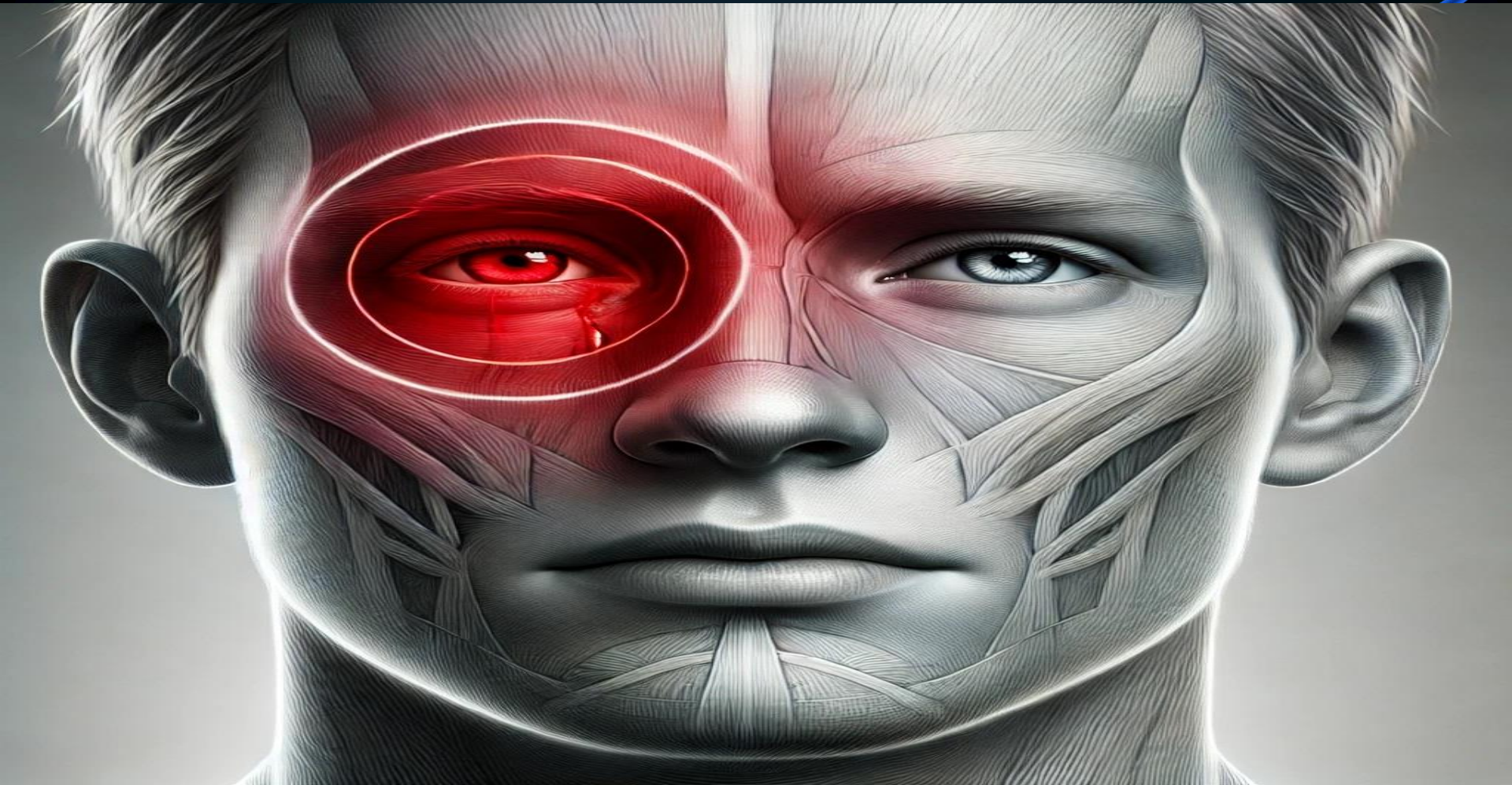
- **First-line preventive medications**: Beta-blockers: Propranolol 40–240 mg/day, Metoprolol 50–200 mg/day, Tricyclic Antidepressants (TCAs): Amitriptyline 10–75 mg at bedtime. Antiepileptics: Topiramate 25–100 mg/day Valproate 250–1000 mg/day (less preferred in women) CGRP Monoclonal Antibodies (Newer Therapies): Erenumab, Fremanezumab, Galcanezumab (monthly injections) Botox (Onabotulinumtoxin A): Approved for chronic migraine (≥15 headache days/month) Lifestyle changers and acknoweledge and reduce triggers (foods, drugs, activities). Duration of Treatment: Typically 3–6 months minimum, sometimes longer, with gradual tapering.

***Importaint to be carefull with all threatment especially in patients with hearth diseases, COPD, asthma, CKD and pregnant women.**

Cluster Headache

03

Cluster headaches are severe, recurring headaches typically around one eye or temple.
Less common than migraines or tension headaches.
It's key feature is occuring in cyclical patterns or "clusters" lasting weeks to months mostly at night or a few hours after patient falls asleep. A typical cluster of headaches may last 4-8weeks with 1-2 headaches/day during the cluster. Patient may be free 6months to 1year before another cluster of headache occurs. Male to Female ratio is 5:1.
Symptoms characterise with excruciating, stabbing pain around one eye. Eye redness, tearing, or nasal congestion on the same side. Restlessness or agitation during the attack. Short but intense episodes (lasting 15 minutes to 3 hours).
Most common triggers are alcohol (even small amounts can trigger an attack), strong odors (solvents, perfumes), high altitudes (rarely). Changes in sleep patterns.



Treatment

Acute Treatment

- **Acute Treatment**
- High-flow Oxygen (100% O_2 at 12–15 L/min for 15–20 min via non-rebreather mask) Most effective, especially in episodic CH (~80% efficacy).
- Subcutaneous (S.C) Sumatriptan 6 mg Fastest-acting triptan; effective within 10–15 minutes.
- Intranasal Zolmitriptan 5 mg Alternative for those who cannot use S.C injections.
- **Second-Line Acute Treatment**
- Intranasal Lidocaine (4%–10%) Works in some cases by numbing the trigeminal nerve.
- Dihydroergotamine (DHE) IV or IM Reserved for resistant cases, requires monitoring.

🚫 **Avoid oral triptans & NSAIDs → Too slow to act for CH**.

Propxylactic Treatment

- **First-Line Preventive Treatment**
- Verapamil (240–960 mg/day, divided doses) is most effective long-term treatment for cluster headache.
- Prednisone (60–80 mg/day, tapering over 2–3 weeks) used as a short-term bridge therapy while Verapamil takes effect.
- **Second-Line Preventive Treatment**
- Lithium (300–900 mg/day, divided doses) effective in chronic CH;
- Topiramate (50–200 mg/day) used when Verapamil is insufficient.
- Galcanezumab (CGRP Monoclonal Antibody, 300 mg/month) FDA-approved for episodic CH; new option.
- **Last Resort (Resistant CH):**
- Greater Occipital Nerve (GON) Block (Lidocaine + Steroid Injection)
- Deep Brain Stimulation (Rare, severe refractory cases).

Trigeminal Neuralgia (TN), SUNCT & SUNA

04

Trigeminal Neuralgia (TN): Is sudden, severe, repetitive and electric shock-like facial lancinating pain along the 2nd and 3rd divisions of the trigeminal nerve.Can be triggered by everyday activities (e.g., chewing, brushing teeth).

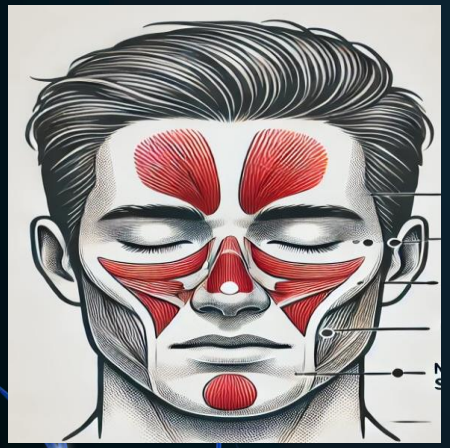
SUNCT (Short-lasting Unilateral Neuralgiform headache attacks with Conjunctival injection and Tearing)
SUNA (Short-lasting Unilateral Neuralgiform headache attacks with cranial Autonomic symptoms):
Extremely brief, repeated attacks of intense pain around the eye or temple.
Accompanied by autonomic features like tearing, redness of the eye (SUNCT) or other autonomic signs (SUNA).

Treatment for Trigeminal Neuralgia, SUNCT, & SUNA
Trigeminal Neuralgia (TN)
First-line Medications: Carbamazepine or oxcarbazepine
Refractory Cases: Microvascular decompression or gamma knife radiosurgery
SUNCT/SUNA
Preventive Therapy: Lamotrigine, topiramate
Acute Attacks: Intravenous lidocaine (in severe episodes)
General Measures: Identify and avoid triggers where possible, ensure regular follow-up.

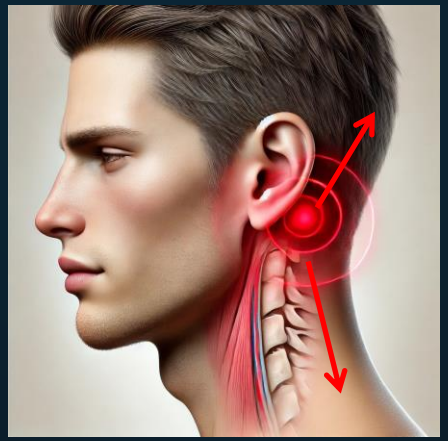
A. Cluster Headache

B. Migraine Headache

C. Tension Headache



D. Sinus Headache



E. Neck Pain/
Occipital Neuralgia

F. Thunderclap Headache

Secondary Headaches

As listed above those headaches have an underlying cause that needs to be identified and treated promptly particularly in life – threatening conditions where timely intervention is crucial.

Case 1

Patient: 40-year-old who experiences intense eye pain every night for a week.
Trigger: Episodes often occur at 2 a.m., awaken the patient from sleep.
Diagnostic measures: Normal neurological status normal MRI
Outcome: Effective relief with high-flow oxygen; started verapamil for prevention.

Cluster Headache

Case 2

Patient: 35-year-old female with 2-year history of throbbing headaches.
Symptoms: Unilateral, pulsating pain; photophobia; phonophobia; occasional aura.
Triggers: Stress, bright lights, irregular sleep patterns.
Diagnostic measures: Normal neurological examination, normal MRI
Treatment: Triptans, NSAIDs, beta-blocker for prevention, plus lifestyle adjustments.
Outcome: Reduced frequency and intensity after consistent therapy and routine changes.

Migraine

Case 3

Patient: 52-year-old male presenting with a sudden, severe “thunderclap” headache.
Symptoms: Neck stiffness, photophobia, brief loss of consciousness.
Diagnostic Measures : not fully alert, but arousable by minimal stimulation, partial gaze palsy, minor facial weakness, mild to moderate disphasia and slurring speech. GCS – 13, NIHHS – 6, CT scan was performed.
Evaluation: CT scan shows bleeding in the subarachnoid space.
Treatment: Urgent neurosurgical consultation, possible aneurysm clipping or coiling.
Outcome: Stabilized with close monitoring in the ICU and follow-up rehabilitation.

Subarachnoid Hemorrhage (SAH)

Conclussion

Headaches come in various forms—tension, migraine, cluster, and beyond—each with unique triggers and treatments. Recognizing the type of headache is crucial for effective management and the most importaint thing because with that we distinguish a chronic condition form a life threathening cause. A thorough history and clinical examination guide decisions on diagnostics and therapy. Lifestyle adjustments, medication, and sometimes specialized interventions can significantly improve quality of life.

Discussion

Individual Variability: Headache severity and triggers differ greatly from person to person. A personalized approach is essential.
Importance of Early Intervention: Prompt identification and treatment can reduce the frequency and intensity of headaches.
Patient Education: Teaching patients about preventive strategies—such as avoiding known triggers, maintaining good sleep hygiene, and stress management—can be as important as medical therapies.
Future Directions: Ongoing research into new medications (like CGRP inhibitors) and neuromodulation therapies may provide better relief for patients with chronic or refractory headaches.

Thank you!