Primary Headaches

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PAIN SENSITIVE STRUCTURE IN HEAD

- Extra-cranial pain sensitive structures:
  - Sinuses
  - Eyes/orbits
  - Ears
  - Teeth
  - TMJ
  - Blood vessels
  - 5,7,9,10 cranial nerves carry pain from this structure
- Intra-cranial pain sensitive structures:
  - Arteries of circle of willis and proximal dural arteries,
  - Dural Venous sinuses, veins
  - Meninges
  - Dura

CLASSIFICATION OF HEADACHE

- PRIMARY - NO structural or metabolic abnormality:
  - Tension
  - Migraine
  - Cluster
- SECONDARY – structural or metabolic abnormality:
  - Extracranial: sinusitis, otitis media, glaucoma, TMJ ds
  - Inracranial: SAH, vasculitis, dissection, central vein thrombosis, tumor, abscess, meningitis
  - Metabolic disorders: CO2 retention, CO poisoning

TABLE 14-1 Common Causes of Headache

Primary Headache		Secondary Headache	
Type	%	Type	%
Tension-type	69	Systemic infection	63
Migraine	16	Head injury	4
Idiopathic stabbing	2	Vascular disorders	1
Exertional	1	Subarachnoid hemorrhage	<1
Cluster	0.1	Brain tumor	0.1

TABLE 14-2 Headache Symptoms That Suggest a Serious Underlying Disorder

"Worst" headache ever
First severe headache
Subacute worsening over days or weeks
Abnormal neurologic examination
Fever or unexplained systemic signs
Vomiting that precedes headache
Pain induced by bending, lifting, cough
Pain that disturbs sleep or presents immediately upon awakening
Known systemic illness
Onset after age 55
Pain associated with local tenderness, e.g., region of temporal artery

CLASSIFICATION OF PRIMARY HEADACHE

- 1. Migraine
- 2. Tension-type headache
- 3. Trigeminal autonomic cephalalgias
- 4. Other primary headache disorders

MIGRAINE

ICHD 3 CLASSIFICATION

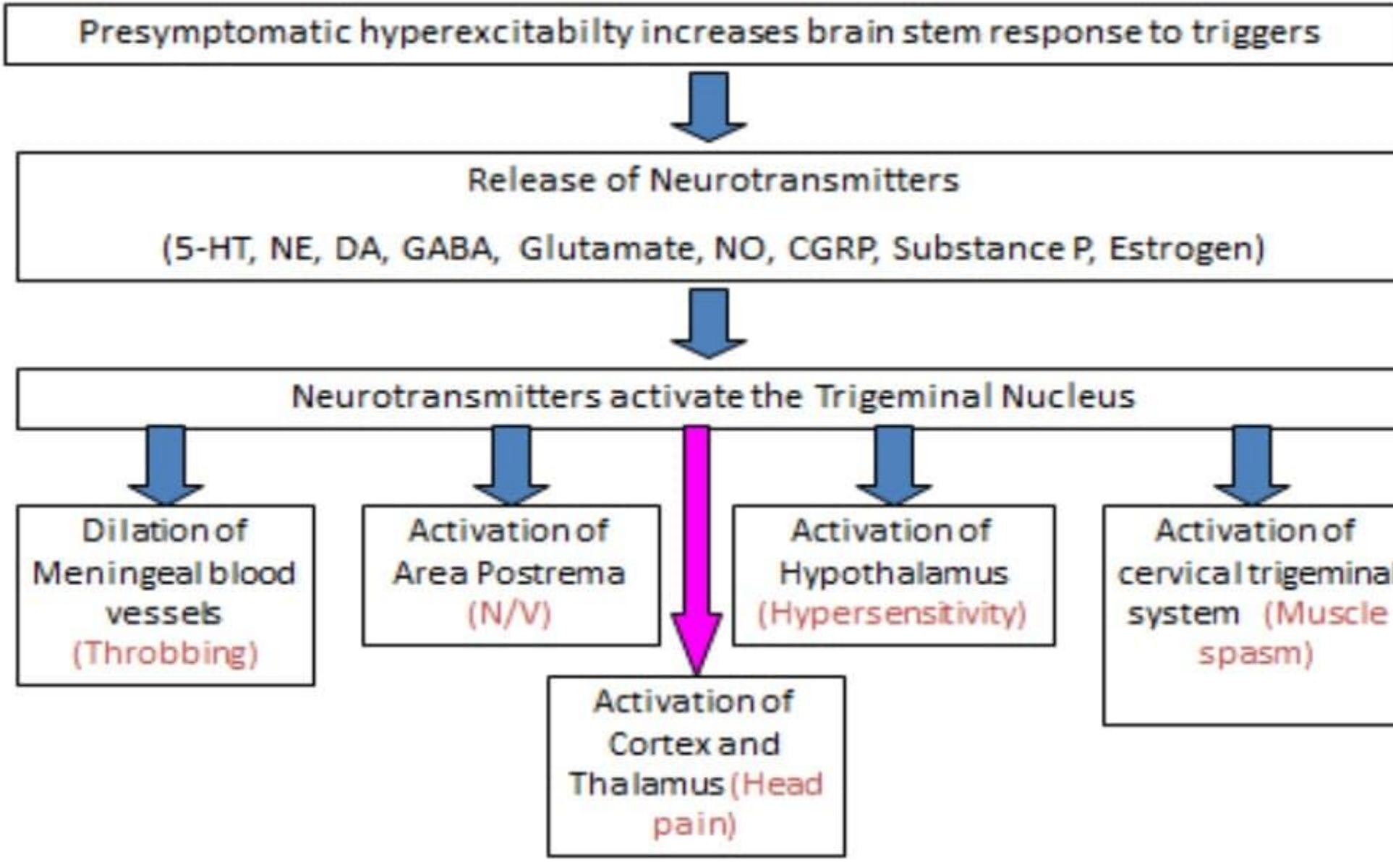
1.1 Migraine without aura
1.2 Migraine with aura
    1.2.1 Migraine with typical aura
        1.2.1.1 Typical aura with headache
        1.2.1.2 Typical aura without headache
    1.2.2 Migraine with brainstem aura
    1.2.3 Hemiplegic migraine
        1.2.3.1 Familial hemiplegic migraine (FHM)
            1.2.3.1.1 Familial hemiplegic migraine type 1
            1.2.3.1.2 Familial hemiplegic migraine type 2
            1.2.3.1.3 Familial hemiplegic migraine type 3
            1.2.3.1.4 Familial hemiplegic migraine, other loci
        1.2.3.2 Sporadic hemiplegic migraine
    1.2.4 Retinal migraine
1.3 Chronic migraine

- 1.4 Complications of migraine
  - 1.4.1 Status migrainosus
  - 1.4.2 Persistent aura without infarction
  - 1.4.3 Migrainous infarction
  - 1.4.4 Migraine aura-triggered seizure
- 1.5 Probable migraine
  - 1.5.1 Probable migraine without aura
  - 1.5.2 Probable migraine with aura
- 1.6 Episodic syndromes that may be associated with migraine
  - 1.6.1 Recurrent gastrointestinal disturbance
    - 1.6.1.1 Cyclical vomiting syndrome
    - 1.6.1.2 Abdominal migraine
  - 1.6.2 Benign paroxysmal vertigo
  - 1.6.3 Benign paroxysmal torticollis

PATHOPHYSIOLOGY

Theories on the pathogenesis of migraine include:

- The vascular theory
- The cortical spreading depression theory
- The neurovascular hypothesis
- The serotonergic abnormalities hypothesis
- The integrated hypothesis.


Presymptomatic hyperexcitabilty increases brain stem response to triggers
Release of Neurotransmitters
(5-HT, NE, DA, GABA, Glutamate, NO, CGRP, Substance P, Estrogen)
Neurotransmitters activate the Trigeminal Nucleus
Dilation of Meningeal blood vessels (Throbbing)
Activation of Area Postrema (N/V)
Activation of Cortex and Thalamus (Head pain)
Activation of Hypothalamus (Hypersensitivity)
Activation of cervical trigeminal system (Muscle spasm)

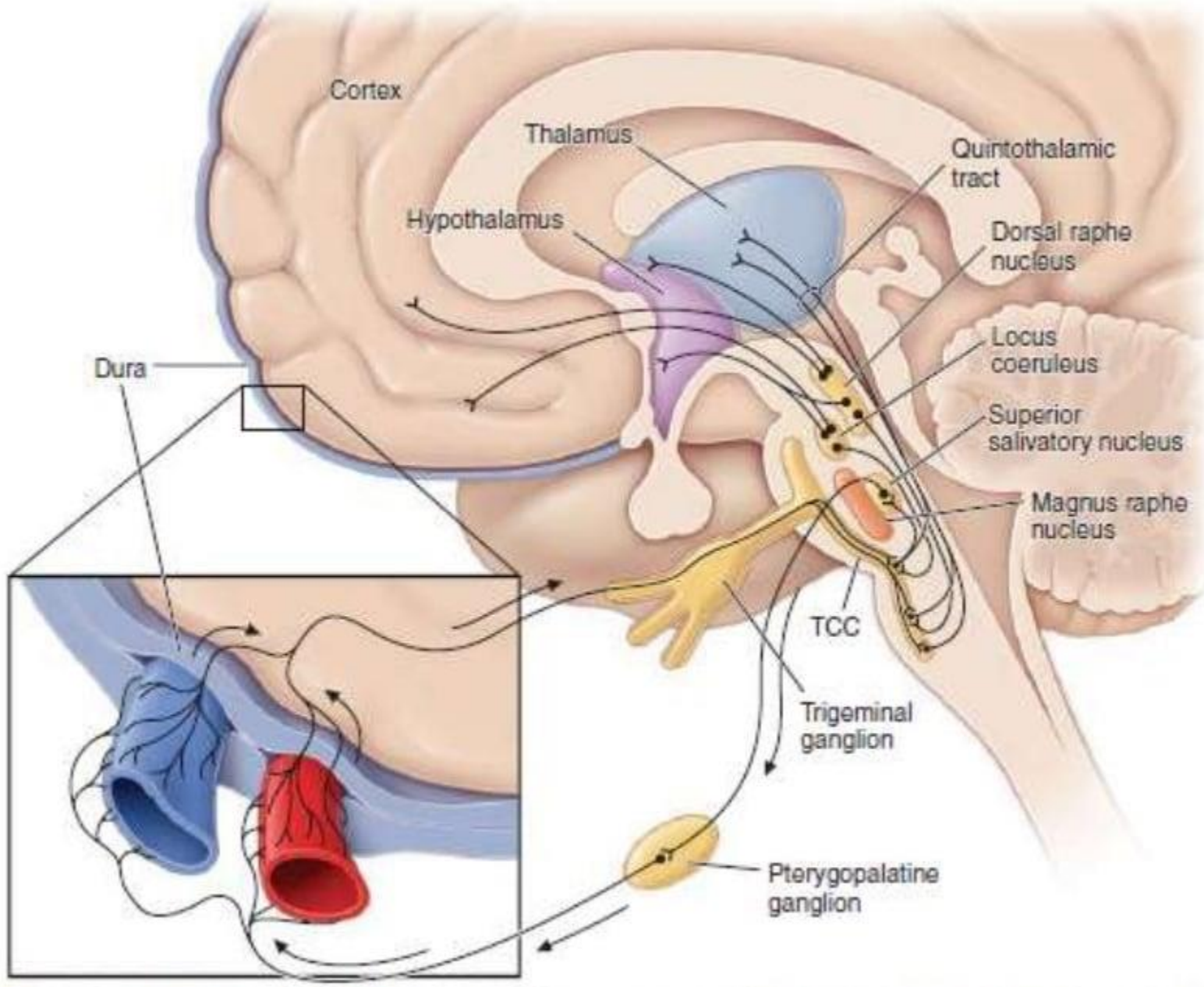


Figure 14-1 Brainstem pathways that modulate sensory input. The key pathway for pain in migraine is the trigeminovascular input from the meningeal vessels, which passes through the trigeminal ganglion and synapses on second-order neurons in the trigeminocervical complex (TCC). These neurons in turn project in the quintothalamic tract and, after decussating in the brainstem, synapse on neurons in the thalamus. Important modulation of the trigeminovascular nociceptive input comes from the dorsal raphe nucleus, locus coeruleus, and nucleus raphe magnus.

EPIDEMOLOGY

- Migraine affects 10-15% of general population, F>M
- Migraine accounts for 10-20% of all headaches in adults
- 1% chronic migraine (>15 days/months)
- Mean frequency 1.2/month
- Mean duration 24 h (untreated)
- 10% always with aura, >30% sometimes with aura
- Usual age at onset is 15-35 years
- Family History:

-70% of patients have relatives with Headache

MIGRAINE TRIGGERS

- **Stress**
- Emotion-(anger, anticipation, anxiety, depression, emotional letdown, exhilaration/excitement, frustration, stress)
- Sex
- Glare-flickering lights/light glare
- Hypoglycemia
- Altered Sleep Pattern-fatigue/sleep deprivation or excessive sleep
- **Menses**
- **Physical exertion**
- Alcohol
- Smoking
- Excess caffeine /**withdrawal**
- **Odors** (perfume, exhaust fumes, paint, solvents)
- **Foods** containing
  - tyramine
  - nitrates
  - phenyl ethylamine
  - Aspartame
  - chocolate
- **Drugs**
  - Estrogen (e.g.. OCP)
  - Nitroglycerin
  - Excess analgesic use or withdrawal
  - (cocaine, cimetidine, estrogens, theophylline)

MIGRAINE WITHOUT AURA

Previously used terms:

- Common migraine; hemicrania simplex.

Description:

- Recurrent headache disorder manifesting in attacks
- Lasting 4-72 hours.
- Typical characteristics of the headache are unilateral location, pulsating quality, moderate or severe intensity, aggravation by routine physical activity and association with nausea and/or photophobia and phonophobia

DIAGNOSTIC CRITERIA

- A. At least five attacks fulfilling criteria B–D
- B. Headache attacks lasting 4-72 hours (untreated or unsuccessfully treated)
- C. Headache has at least two of the following four characteristics:
    1. unilateral location
    2. pulsating quality
    3. moderate or severe pain intensity
    4. aggravation by or causing avoidance of routine physical activity (e.g. walking or climbing stairs)

- D. During headache at least one of the following:
    1. nausea and/or vomiting
    2. photophobia and phonophobia
- E. Not better accounted for by another ICHD-3 diagnosis.

MIGRAINE WITH AURA

Previously used terms:

- Classic or classical migraine; complicated migraine.

Description:

- Recurrent attacks, lasting minutes, of unilateral fully reversible visual, sensory or other central nervous system symptoms that usually develop gradually and are usually followed by headache and associated migraine symptoms.

DIAGNOSTIC CRITERIA

- A. At least two attacks fulfilling criteria B and C
- B. One or more of the following fully reversible aura symptoms:
    1. visual
    2. sensory
    3. speech and/or language
    4. motor
    5. brainstem
    6. retinal
- C. At least two of the following four characteristics:
    1. at least one aura symptom spreads gradually over 5 minutes, and/or two or more symptoms occur in succession
    2. each individual aura symptom lasts 5-60minutes
    3. at least one aura symptom is unilateral
    4. aura is accompanied, or followed within 60 minutes, by headache
- D. Not better accounted for by another ICHD-3 diagnosis, and transient ischemic attack has been excluded.

- Aura is complex of neurological symptoms that occurs usually before the headache of but it may begin after the pain phase has commenced, or continue into the headache phase.
- Visual aura is the most common type of aura, occurring in over 90% of patients.
- It often presents as fortification spectrum
- Is risk factor for ischemic stroke
- Patent foramen ovale in patients with migraine with aura
- 4 Phases:
  - Prodrome, Aura, Headache and Resolution/postdrome

Migraine with brainstem aura

Diagnostic criteria:

- A. At least two attacks fulfilling criteria B-D
- B. Aura consisting of visual, sensory and/or speech/ language symptoms, each fully reversible, but no motor or retinal symptoms
- C. At least two of the following brainstem symptoms:
  1. dysarthria
  2. vertigo
  3. tinnitus
  4. hypacusis
  5. diplopia
  6. ataxia
  7. decreased level of consciousness

- D. At least two of the following four characteristics:

  1. at least one aura symptom spreads gradually over 5 minutes, and/or two or more symptoms occur in succession

  2. each individual aura symptom lasts 5-60 minutes2

  3. at least one aura symptom is unilateral3

  4. aura is accompanied, or followed within 60 minutes, by headache

- E. Not better accounted for by another ICHD-3 diagnosis, and transient ischaemic attack has been excluded.

Hemiplegic migraine

Diagnostic criteria:

- A. At least two attacks fulfilling criteria B and C
- B. Aura consisting of both of the following:

  1. fully reversible motor weakness

  2. fully reversible visual, sensory and/or speech/ language symptoms
- C. At least two of the following four characteristics:

  1. at least one aura symptom spreads gradually over 5 minutes, and/or two or more symptoms occur in succession

  2. each individual non-motor aura symptom lasts 5–60 minutes, and motor symptoms last <72 hours

  3. at least one aura symptom is unilateral

  4. the aura is accompanied, or followed within 60 minutes, by headache
- D. Not better accounted for by another ICHD-3 diagnosis, and transient ischaemic attack and stroke have been excluded.

MIGRAINE IN WOMEN

- Migraine 2-3x more common than in men
  - Possibly some hormonal association
- 14% of women experience migraine associated with periods
  - Usually during first 3 days
- Risk of migraine increased 10x in women on OCP
  - OCP increase frequency of migraines
  - Almost half women experience improvement in migraine during pregnancy.
  - Migraine frequency decreases in 2/3 women after menopause

CHILDHOOD MIGRAINE

- Prevalence 5%
- Sex ratio 1:1
- Abdominal symptoms often predominant
- Semiology of attacks as in adulthood except shorter duration of attacks
- Children often respond to conservative management
- Short sleep very effective

Severity levels:

- **Mild-** Patient is aware of a headache but is able to continue daily routine with minimal alteration.
- **Moderate** -headache inhibits daily activities but is not incapacitating.
- **Severe** -headache is incapacitating.
- **Status** - severe headache that has lasted more than 72 hours.

MANAGEMENT

1. Assess extent of a patient's disease and disability- Migraine Disability Assessment Score (MIDAS)

2. NONPHARMACOLOGIC MANAGEMENT-

- Identification and avoidance of specific headache triggers.
- Healthful diet, regular exercise, regular sleep patterns, avoidance of excess caffeine and alcohol, and avoidance of acute changes in stress levels.

*MIDAS Questionnaire

INSTRUCTIONS: Please answer the following questions about ALL headaches you have had over the last 3 months. Write zero if you did not do the activity in the last 3 months.

1. On how many days in the last 3 months did you miss work or school because of your headaches? ..... ____days
2. How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches *(do not include days you counted in question 1 where you missed work or school)*? ..... ____days
3. On how many days in the last 3 months did you **not** do household work because of your headaches? ..... ____days
4. How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches *(do not include days you counted in question 3 where you did not do household work)*? ..... ____days
5. On how many days in the last 3 months did you miss family, social, or leisure activities because of your headaches? ..... ____days

A. On how many days in the last 3 months did you have a headache? *(If a headache lasted more than one day, count each day.)* ..... ____days

B. On a scale of 0–10, on average how painful were these headaches? *(Where 0 = no pain at all, and 10 = pain as bad as it can be.)* ..... ____

*Migraine Disability Assessment Score
(Questions 1–5 are used to calculate the MIDAS score.)
Grade I—Minimal or Infrequent Disability: 0–5
Grade II—Mild or Infrequent Disability: 6–10
Grade III—Moderate Disability: 11–20
Grade IV—Severe Disability: > 20

ACUTE ATTACK THERAPIES FOR MIGRAINE

Drug	Trade Name	Dosage
Simple Analgesics		
Acetaminophen, aspirin, caffeine	Excedrin Migraine	Two tablets or caplets q6h (max 8 per day)
NSAIDs		
Naproxen	Aleve, Anaprox, generic	220–550 mg PO bid
Ibuprofen	Advil, Motrin, Nuprin, generic	400 mg PO q3–4h
Tolfenamic acid	Clotam Rapid	200 mg PO. May repeat ×1 after 1–2 h
Dopamine Antagonists		
Oral		
Metoclopramide	Reglan,[a] generic[a]	5–10 mg/d
Prochlorperazine	Compazine,[a] generic[a]	1–25 mg/d
Parenteral		
Chlorpromazine	Generic[a]	0.1 mg/kg IV at 2 mg/min; max 35 mg/d
Metoclopramide	Reglan,[a] generic	10 mg IV
Prochlorperazine	Compazine,[a] generic[a]	10 mg IV
Other		
Oral		
Acetaminophen, 325 mg, *plus* dichloralphenazone, 100 mg, *plus* isometheptene, 65 mg	Midrin, Duradrin, generic	Two capsules at onset followed by 1 capsule q1h (max 5 capsules)
Nasal		
Butorphanol	Stadol[a]	1 mg (1 spray in 1 nostril), may repeat if necessary in 1–2 h
Parenteral		
Narcotics	Generic[a]	Multiple preparations and dosages; see Table 11-1

5-HT$_1$ Agonists		
Oral		
Ergotamine	Ergomar	One 2 mg sublingual tablet at onset and q$^1/_2$h (max 3 per day, 5 per week)
Ergotamine 1 mg, caffeine 100 mg	Ercaf, Wigraine	One or two tablets at onset, then one tablet q$^1/_2$h (max 6 per day, 10 per week)
Naratriptan	Amerge	2.5 mg tablet at onset; may repeat once after 4 h
Rizatriptan	Maxalt	5–10 mg tablet at onset; may repeat after 2 h (max 30 mg/d)
	Maxalt-MLT	
Sumatriptan	Imitrex	50–100 mg tablet at onset; may repeat after 2 h (max 200 mg/d)
Frovatriptan	Frova	2.5 mg tablet at onset, may repeat after 2 h (max 5 mg/d)
Almotriptan	Axert	12.5 mg tablet at onset, may repeat after 2 h (max 25 mg/d)
Eletriptan	Relpax	40 or 80 mg
Zolmitriptan	Zomig	2.5 mg tablet at onset; may repeat after 2 h (max 10 mg/d)
	Zomig Rapimelt	
Nasal		
Dihydroergotamine	Migranal Nasal Spray	Prior to nasal spray, the pump must be primed 4 times; 1 spray (0.5 mg) is administered, followed in 15 min by a second spray
Sumatriptan	Imitrex Nasal Spray	5–20 mg intranasal spray as 4 sprays of 5 mg or a single 20 mg spray (may repeat once after 2 h, not to exceed a dose of 40 mg/d)
Zolmitriptan	Zomig	5 mg intranasal spray as one spray (may repeat once after 2 h, not to exceed a dose of 10 mg/d)

ANALGESICS

- Useful in early stages or for mild-moderate migraine
- Only if patient can tolerate oral medication
- Aspirin 900 mg is recommended for acute treatment in patients with all severities of migraine.
- Ibuprofen 400 mg is recommended for acute treatment in patients with migraine.
- Other NSAIDs (tolfenamic acid, diclofenac, naproxen and flurbiprofen) can be used in treatment of acute migraine attacks.
- Paracetamol 1,000 mg is recommended as acute treatment for mild to moderate migraine.

TRIPTANS

- Proven efficacy
  - Improvement in 70% in 1 hour, 85% in 2 hours
  - Generally well tolerated
    - Avoid with MAO-A inhibitors
    - Avoid in pts with ischemic heart disease (IHD), angina, myocardial infarction (MI), uncontrolled hypertension (HT)
  - Failure with one triptan does not preclude use of another
    - Patients respond variably to different drugs
  - Do not combine with ergot agents
  - Adverse effects can include chest pressure, flushing, dizziness, drowsiness, and nausea.

- Action - binds to serotonin 5-HT1B, 5-HT1D and 5-HT1F receptors in cranial blood vessels (causing their constriction) and subsequent inhibition of pro-inflammatory neuropeptide release (CGRP and substance P).

ANTIEMETICS

- Prevent and treat nausea
- Improve GI motility
- Enhance absorption of other anti-migraine medications
- Promethazine
  - Available PO, IM, PR
  - Dose = 25-50 mg
  - Blocks dopamine and histamine receptors
- Prochlorperazine
  - Available PO, IM, IV, PR
  - Dose = 5-10 mg
  - Blocks dopamine receptors

- **Mild migraine treatment (self-management):**
  - APAP/ASA/Caffeine
  - ASA alone
  - Lidocaine nasal
  - Midrin
  - NSAIDs
  - Triptans
- **Moderate migraine treatment:**
  - DHE (dihydroergotamine mesylate)
  - Lidocaine nasal
  - Midrin
  - NSAIDs
  - Triptans
- **Severe migraine treatment:**
  - Prochlorperazine
  - Chlorpromazine
  - DHE
  - Ketorolac IM
  - Magnesium Sulfate IV
  - Triptans

- **Adjunctive therapy for all migraines:**
  - Rest in quiet, dark room
  - IV rehydration
  - Antiemetics:
    - Hydroxyzine
    - Metoclopramide
    - Prochlorperazine
    - Promethazine
  - Caffeine

MIGRAINE PROPHYLAXIS

- **Preventive therapy may be more appropriately guided by one or more of the following circumstances:**
    - >2 attacks per week
    - prolonged attacks (>48hrs)
    - severe and disruptive (patient cannot function)
    - Regular, predicted attacks (menstrual migraine)
    - Patient preference or special circumstances
    - Presence of uncommon migraine conditions, including hemiplegic migraine, basilar migraine, migraine with prolonged aura, and migrainous infarction

TABLE 14-7 Preventive Treatments in Migraine[a]

Drug	Dose	Selected Side Effects
Pizotifen[b]	0.5–2 mg qd	Weight gain
		Drowsiness
Beta blocker		
Propranolol	40–120 mg bid	Reduced energy
		Tiredness
		Postural symptoms
		Contraindicated in asthma
Tricyclics		
Amitriptyline	10–75 mg at night	Drowsiness
Dothiepin	25–75 mg at night	
Nortriptyline	25–75 mg at night	***Note:*** Some patients may only need a total dose of 10 mg, although generally 1–1.5 mg/kg body weight is required
Serotonergic drugs		
Methysergide	1–4 mg qd	Drowsiness
		Leg cramps
		Hair loss
		Retroperitoneal fibrosis (1-month drug holiday is required every 6 months)
Flunarizine[b]	5–15 mg qd	Drowsiness
		Weight gain
		Depression
		Parkinsonism

Anticonvulsants		
Topiramate	25–200 mg/d	Paresthesias Cognitive symptoms Weight loss Glaucoma Caution with nephrolithiasis
Valproate	400–600 mg bid	Drowsiness Weight gain Tremor Hair loss Fetal abnormalities Hematologic or liver abnormalities
Gabapentin	900–3600 mg qd	Dizziness Sedation
No convincing evidence from controlled trials		
Verapamil		
Controlled trials demonstrate *no effect*		
Nimodipine		
Clonidine		
SSRIs: fluoxetine		

BOTOLINUM TOXIN A

- Dose = 155-195 units injected into muscles of face, neck and head
- Mecahnism of Action
  - Blocks release of Substance P and CGRP
    Inhibits peripheral signals to CNS and blocks central sensitization
- Efficacy
  - Botulinum Toxin superior to placebo in 2 large, double blind, randomized, controlled trials
  - Botulinum Toxin similar to topiramate and amitriptyline in small, shorter duration studies
  - Botulinum toxin = placebo for episodic migraine
- Side effects = muscle weakness, injection site pain

- **First-line treatment:**
  - Beta blockers, calcium channel blockers, tricyclic antidepressants
  - Antiepileptics (divalproex, topiramate, gabapentin)
  - Patient education and lifestyle management
  - Screen for depression/anxiety
  - Other therapies available, but with varying levels of scientific support. Refer to complete guideline for this information
- **Second-line treatment:**
  - Different first-line med class or different drug of same class
  - Combination of beta blockers and tricyclics
- **If menstrual-associated migraine:**
  - Consider cyclic prophylaxis with NSAIDs (first choice), triptans, OR
  - Hormone prophylaxis (transdermal estradiol, estrogen-containing contraceptives)
  - Suppress menstrual cycle with GnRH agonist and "add back" therapy
- **If menopausal or perimenopausal migraine:**
  - Consider hormone therapy (oral or transdermal estrogen, progestin, or estrogen-containing contraceptives)
  - Therapy success defined as 50% reduction in headache frequency and/or severity
  - Hormone therapy may worsen migraines in some women
- **If using or considering estrogen-containing contraceptives:**
  - Evaluate vascular risk factors, such as risk for CAD, history of blood clots, migraine with aura, smoking
  - Risk of ischemic stroke increases with use of estrogen-containing contraceptives
  - Women with prolonged aura, or those who have an aura for the first time while using estrogen containing contraceptives, should be discouraged from using them.

Table 1 Classification of migraine preventive therapies (available in the United States)

Level A: Medications with established efficacy (≥2 Class I trials)	Level B: Medications are probably effective (1 Class I or 2 Class II studies)	Level C: Medications are possibly effective (1 Class II study)	Level U: Inadequate or conflicting data to support or refute medication use	Other: Medications that are established as possibly or probably ineffective
Antiepileptic drugs	Antidepressants/ SSRI/SSNRI/TCA	ACE inhibitors	Carbonic anhydrase inhibitor	Established as not effective
Divalproex sodium	Amitriptyline	Lisinopril	Acetazolamide	Antiepileptic drugs
Sodium valproate	Venlafaxine	Angiotensin receptor blockers	Antithrombotics	Lamotrigine
Topiramate	β-Blockers	Candesartan	Acenocoumarol	Probably not effective
β-Blockers	Atenolol[a]	α-Agonists	Coumadin	Clomipramine[a]
Metoprolol	Nadolol[a]	Clonidine[a]	Picotamide	Possibly not effective
Propranolol	Triptans (MRM[b])	Guanfacine[a]	Antidepressants SSRI/SSNRI	Acebutolol[a]
Timolol[a]	Naratriptan[b]	Antiepileptic drugs	Fluvoxamine[a]	Clonazepam[a]
Triptans (MRM[b])	Zolmitriptan[b]	Carbamazepine[a]	Fluoxetine	Nabumetone[a]
Frovatriptan[b]		β-Blockers	Antiepileptic drugs	Oxcarbazepine
		Nebivolol	Gabapentin	Telmisartan
		Pindolol[a]	TCAs	
		Antihistamines	Protriptyline[a]	
		Cyproheptadine	β-Blockers	
			Bisoprolol[a]	
			Ca++ blockers	
			Nicardipine[a]	
			Nifedipine[a]	
			Nimodipine	
			Verapamil	

TENSION-TYPE HEADACHE

- Tension-type headache (TTH) is chronic head-pain syndrome characterized by bilateral tight, bandlike discomfort.
- Pain typically builds slowly, fluctuates in severity, and may persist more or less continuously for many days.
- Headache may be episodic or chronic
- Headaches are completely without accompanying features such as nausea, vomiting, photophobia, phonophobia, osmophobia, throbbing, and aggravation with movement.
- Prevalence - 30% and 78%

ICHD 3 CLASSIFICATIONS

- 2.1 Infrequent episodic tension-type headache
- 2.2 Frequent episodic tension-type headache
- 2.3 Chronic tension-type headache
- 2.4 Probable tension-type headache

Pathophysiology

- Peripheral pain mechanisms are most likely to play a role in Infrequent episodic tension type headache and Frequent episodic tension-type headache.
- Central pain mechanisms play more important role in Chronic tension-type headache.
- Increased pericranial tenderness may be recorded by manual palpation.
- Tenderness is typically present interictally, is further increased during actual headache and increases with intensity and frequency of headaches.

Infrequent episodic tension-type headache

Description:

- Infrequent episodes of headache, typically bilateral, pressing or tightening in quality and of mild to moderate intensity, lasting minutes to days.
- Pain does not worsen with routine physical activity and is not associated with nausea, but photophobia or phonophobia may be present.

Diagnostic criteria:

- A. At least 10 episodes of headache occurring on <1 day per month on average (<12 days per year) and fulfilling criteria B-D
- B. Lasting from 30 minutes to 7 days
- C. At least two of the following four characteristics:
  1. bilateral location
  2. pressing or tightening (non-pulsating) quality
  3. mild or moderate intensity
  4. not aggravated by routine physical activity such as walking or climbing stairs
- D. Both of the following:
  1. no nausea or vomiting
  2. no more than one of photophobia or phonophobia
- E. Not better accounted for by another ICHD-3 diagnosis

Frequent episodic tension-type headache

- A. At least 10 episodes of headache occurring on 1-14 days per month on average for >3 months (12 and <180 days per year) and fulfilling criteria B-D
- B. Lasting from 30 minutes to 7 days
- C. At least two of the following four characteristics:
  1. bilateral location
  2. pressing or tightening (non-pulsating) quality
  3. mild or moderate intensity
  4. not aggravated by routine physical activity such as walking or climbing stairs
- D. Both of the following:
  1. no nausea or vomiting
  2. no more than one of photophobia or phonophobia
- E. Not better accounted for by another ICHD-3 diagnosis.

MANAGEMENT

Acute Treatment-

- Simple analgesics such as acetaminophen, aspirin, or NSAIDs.
- Behavioral approaches including relaxation can also be effective.
- High risk of rebound headaches
- Limit acute treatment to 2-3 days per week

Preventive Treatment (Chronic TTH)

more than 15 headaches/month

Non-Pharmacologic

- Proper sleep hygiene
- Stress management
- Acupuncture
- Biofeedback
- Physical therapy

Pharmacologic

- TCAs

TRIGEMINAL AUTONOMIC CEPHALALGIAS

- TACs are characterized by relatively short lasting attacks of head pain associated with cranial autonomic symptoms, such as lacrimation, conjunctival injection, or nasal Congestion

Includes:

- Cluster headache,
- Paroxysmal hemicrania, and
- SUNCT
- Hemicrania continua
- Probable trigeminal autonomic cephalalgia

CLUSTER HEADACHE

Diagnostic criteria:

- A. At least five attacks fulfilling criteria B–D
- B. Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15–180 minutes (when untreated)
- C. Either or both of the following:
- 1. at least one of the following symptoms or signs, ipsilateral to headache:
  - a) conjunctival injection and/or lacrimation
  - b) nasal congestion and/or rhinorrhoea
  - c) eyelid oedema
  - d) forehead and facial sweating
  - e) forehead and facial flushing
  - f) sensation of fullness in the ear
  - g) miosis and/or ptosis
- 2. a sense of restlessness or agitation
- D. Attacks have a frequency between one every other day and eight per day for more than half of the time when the disorder is active
- E. Not better accounted for by another ICHD-3 diagnosis.

ACUTE ATTACK TREATMENT

- 1. **OXYGEN-** 100% oxygen at 10–12 L/min for 15–20 min.
- High flow and high oxygen content are important.

- 2. **TRYPTAN-** Sumatriptan 6 mg SC is rapid in onset and usually shorten attack to 10–15 min;
- Sumatriptan (20 mg) and zolmitriptan (5 mg) nasal sprays are both effective in acute cluster headache.

- 3. **DHE** – IV provide prompt and effective relief

TABLE 14-9 Preventive Management of Cluster Headache

Short-Term Prevention	Long-Term Prevention
Episodic Cluster Headache	**Episodic Cluster Headache & Prolonged Chronic Cluster Headache**
Prednisone 1 mg/kg up to 60 mg qd, tapering over 21 days	Verapamil 160–960 mg/d
	Lithium 400–800 mg/d
Methysergide 3–12 mg/d	Methysergide 3–12 mg/d
Verapamil 160–960 mg/d	Topiramate[a] 100–400 mg/d
Greater occipital nerve injection	Gabapentin[a] 1200–3600 mg/d
	Melatonin[a] 9–12 mg/d

- **NEUROSTIMULATION THERAPY-**Deep-brain stimulation of the region of the posterior hypothalamic gray matter.
- Less-invasive approach of occipital nerve stimulation

PAROXYSMAL HEMICRANIA

- A. At least 20 attacks fulfilling criteria B-E
- B. Severe unilateral orbital, supraorbital and/or temporal pain lasting 2–30 minutes
- C. At least one of the following symptoms or signs, ipsilateral to the pain:
  1. conjunctival injection and/or lacrimation
  2. nasal congestion and/or rhinorrhoea
  3. eyelid oedema
  4. forehead and facial sweating5. forehead and facial flushing
  6. sensation of fullness in the ear
  7. miosis and/or ptosis
- D. Attacks have a frequency above five per day for more than half of the time
- E. Attacks are prevented absolutely by therapeutic doses of indomethacin
- F. Not better accounted for by another ICHD-3 diagnosis.

Secondary PH-

- Reported with lesions in the region of sella turcica, including arteriovenous malformation, cavernous sinus meningioma, and epidermoid tumor.
- Secondary PH is more likely if the patient requires high doses (>200 mg/d) of indomethacin.
- In patients with apparent bilateral PH, raised CSF pressure should be suspected.
- When a diagnosis of PH is considered, MRI is indicated to exclude a pituitary lesion.
- Occasionally PH can coexist with trigeminal neuralgia.

TREATMENT-

- Indomethacin (25–75 mg tid), which can completely suppress attacks of PH, is the treatment of choice.
- Others-Topiramate, Piroxicam

SUNCT/SUNA

Diagnostic criteria:

- A. At least 20 attacks fulfilling criteria B–D
- B. Moderate or severe unilateral head pain, with orbital, supraorbital, temporal and/or other trigeminal distribution, lasting for 1–600 seconds and occurring as single stabs, series of stabs or in a saw tooth pattern
- C. At least one of the following cranial autonomic symptoms or signs, ipsilateral to the pain:
    1. conjunctival injection and/or lacrimation
    2. nasal congestion and/or rhinorrhoea
    3. eyelid oedema
    4. forehead and facial sweating
    5. forehead and facial flushing
    6. sensation of fullness in the ear
    7. miosis and/or ptosis
- D. Attacks have a frequency of at least one a day for more than half of the time when the disorder is active
- E. Not better accounted for by another ICHD-3 diagnosis.

Secondary (Symptomatic) SUNCT

- Can be seen with posterior fossa or pituitary lesions.
- All patients with SUNCT/SUNA should be evaluated with pituitary function tests and a brain MRI with pituitary views.

(SUNCT)

- A. Attacks fulfilling criteria for Short-lasting unilateral neuralgiform headache attacks
- B. Both of conjunctival injection and lacrimation (tearing).

(SUNA)

- A. Attacks fulfilling criteria for Short-lasting unilateral neuralgiform headache attacks, and criterion B below
- B. Only one or neither of conjunctival injection and lacrimation (tearing).

TREATMENT

ABORTIVE THERAPY-

- IV lidocaine, which arrests the symptoms, can be used in hospitalized patients.

PREVENTIVE THERAPY-

- Lamotrigine, 200– 400 mg/d.
- Topiramate and gabapentin may also be effective.
- Carbamazepine, 400–500 mg/d

Surgical approaches-

- microvascular decompression or destructive trigeminal procedure
- Greater occipital nerve injection
- Occipital nerve stimulation
- deep-brain stimulation of the posterior hypothalamic region

Differential diagnosis of primary headaches

Clinical feature	Migraine	Cluster headache	Tension headache
Family history	Yes	No	Yes
Sex	More females	More males	More females
Onset	Variable	During sleep	Under stress
Location	Usually unilateral in adults	Behind/around one eye	Bilateral in band around head
Character/severity	Pulsatile Throbbing	Excruciating/ sharp Steady	Dull Persistent Tightening/ pressing
Frequency/ duration	2–72 h/attack 1 attack/year to >8 per month	15–90 min/attack 1–8 attacks/day for 3–16 weeks 1–2 bouts/year	30 min to 7 days 3–4 attacks/week to 1–2 attacks/year
Associated symptoms	Visual aura Phonophobia Photophobia Pallor Nausea/vomiting	Sweating Facial flushing Nasal congestion Ptosis Lacrimation Conjunctival injection Pupillary changes	Mild photophobia Mild phonophobia Anorexia

TABLE 14-8 Clinical Features of the Trigeminal Autonomic Cephalalgias

	Cluster Headache	Paroxysmal Hemicrania	SUNCT
Gender	M > F	F = M	F ~ M
Pain			
Type	Stabbing, boring	Throbbing, boring, stabbing	Burning, stabbing, sharp
Severity	Excruciating	Excruciating	Severe to excruciating
Site	Orbit, temple	Orbit, temple	Periorbital
Attack frequency	1/alternate day–8/d	1–40/d (>5/d for more than half the time)	3–200/d
Duration of attack	15–180 min	2–30 min	5–240 s
Autonomic features	Yes	Yes	Yes (prominent conjunctival injection and lacrimation)[a]
Migrainous features[b]	Yes	Yes	Yes
Alcohol trigger	Yes	No	No
Cutaneous triggers	No	No	Yes
Indomethacin effect	—	Yes[c]	—
Abortive treatment	Sumatriptan injection or nasal spray Oxygen	No effective treatment	Lidocaine (IV)
Prophylactic treatment	Verapamil Methysergide Lithium	Indomethacin	Lamotrigine Topiramate Gabapentin

CHRONIC DAILY HEADACHE

- Headache occurring on 15 or more days per month for more than 3 months
- 4% of adults have daily or near-daily headache. Daily headache may be primary or secondary

TABLE 14-10 Classification of Chronic Daily Headache

Primary		
>4 h Daily	<4 h Daily	Secondary
Chronic migraine[a]	Chronic cluster headache[b]	Posttraumatic Head injury Iatrogenic Postinfectious
Chronic tension-type headache[a]	Chronic paroxysmal hemicrania	Inflammatory, such as Giant cell arteritis Sarcoidosis Behçet's syndrome
Hemicrania continua[a]	SUNCT/SUNA	Chronic CNS infection
New daily persistent headache[a]	Hypnic headache	Medication-overuse headache[a]

NEW DAILY PERSISTENT HEADACHE

- Presents with headache on most if not all days and the patient can clearly, and often vividly, recall the moment of onset.
- Headache usually begins abruptly, but onset may be more gradual;
- Evolution over 3 days has been proposed as the upper limit for this syndrome.
- Primary NDPH occurs in both males and females.
- Some patients have a previous history of migraine.

TABLE 14-11 Differential Diagnosis of New Daily Persistent Headache

Primary	Secondary
Migrainous-type	Subarachnoid hemorrhage
Featureless (tension-type)	Low CSF volume headache
	Raised CSF pressure headache
	Posttraumatic headache[a]
	Chronic meningitis

- Treatment of migrainous-type primary NDPH- preventive therapies effective in migraine.
- Featureless NDPH is most refractory to treatment.

MEDICATION-OVERUSE HEADACHE

Diagnostic criteria:

- A. Headache occurring on 15 days per month in a patient with a pre-existing headache disorder

- B. Regular overuse for >3 months of one or more drugs that can be taken for acute and/or symptomatic treatment of headache

1.Regular intake of ergotamine on 10 days per month for >3 months.

2. Regular intake of one or more triptans, in any formulation, on 10 days per month for >3 months.

3. Regular intake of one or more NSAIDs on 15 days per month for >3 months.

4. Regular intake of one or more opioids on 10 days per month for >3 months.

- C. Not better accounted for by another ICHD-3 diagnosis.

Management

- Withdrawal of overused acute medication
  - Abrupt
  -Gradual

- Transitional treatment
  - Prednisolone 60-100 mg for 5 days

- Preventive treatment

Primary cough headache

Diagnostic criteria:

- A. At least two headache episodes fulfilling criteria BD
- B. Brought on by and occurring only in association with coughing, straining and/or other Valsalva manoeuvre
- C. Sudden onset
- D. Lasting between 1 second and 2 hours
- E. Not better accounted for by another ICHD-3 diagnosis.

Differential diagnosis-

- Chiari malformation or any lesion causing obstruction of CSF pathways or displacing cerebral structures
- Cerebral aneurysm, carotid stenosis, and vertebrobasilar disease.
- Benign exertional headache

TREATMENT

- Indomethacin 25–50 mg two to three times daily .
- Some patients obtain pain relief with LP

Primary exertional headache

Diagnostic criteria:

- A. At least two headache episodes fulfilling criteria B and C
- B. Brought on by and occurring only during or after strenuous physical exercise
- C. Lasting <48 hours
- D. Not better accounted for by another ICHD-3 diagnosis.

Differential diagnosis

- cardiac cephalgia, Pheochromocytoma
- Intracranial lesions and stenosis of the carotid arteries.

TREATMENT

- Indomethacin (50 mg), ergotamine (1 mg orally), dihydroergotamine (2 mg by nasal spray), or methysergide (1–2 mg orally given 30–45 min before exercise

Primary sex headache

Diagnostic criteria:

- A. At least two episodes of pain in the head and/or neck fulfilling criteria B-D
- B. Brought on by and occurring only during sexual activity
- C. Either or both of the following:
  1. increasing in intensity with increasing sexual excitement
  2. abrupt explosive intensity just before or with orgasm
- D. Lasting from 1 minute to 24 hours with severe intensity and/or up to 72 hours with mild intensity
- E. Not better accounted for by another ICHD-3 diagnosis.

- Headache can be prevented or eased by ceasing sexual activity before orgasm.
- Three types of sex headache are reported:

1. Dull ache in the head and neck that intensifies as sexual excitement increases;
2. Sudden, severe, explosive headache occurring at orgasm;
3. Postural headache developing after coitus that resembles the headache of low CSF pressure.

- Are not always benign;
- 5–12% of cases of subarachnoid hemorrhage are precipitated by sexual intercourse.
- Men > women

TREATMENT

- Reassurance and advice about ceasing sexual activity if a mild, warning headache develops
- Propranolol - 40 to 200 mg/d.
- Calcium channel–blocking -Diltiazem, 60 mg tid. Ergotamine (1 mg) or indomethacin (25–50 mg) taken about 30–45 min prior to sexual activity.

Primary thunderclap headache

Diagnostic criteria:

- A. Severe head pain fulfilling criteria B and C
- B. Abrupt onset, reaching maximum intensity in <1 minute
- C. Lasting for 5 minutes
- D. Not better accounted for by another ICHD-3 diagnosis.

- **Differential diagnosis** – sentinel bleed of an intracranial aneurysm, cervicocephalic arterial dissection, and cerebral venous thrombosis
- ingestion of sympathomimetic drugs or of tyramine-containing foods in a patient who is taking MAOIs,
- pheochromocytoma.

Reversible segmental cerebral vasoconstriction may be seen in primary thunderclap headache without an intracranial aneurysm

Treatment - nimodipine

Hypnic headache

Diagnostic criteria:

- A. Recurrent headache attacks fulfilling criteria B-E
- B. Developing only during sleep, and causing wakening
- C. Occurring on 10 days per month for >3 months
- D. Lasting 15 minutes and for up to 4 hours after waking
- E. No cranial autonomic symptoms or restlessness
- F. Not better accounted for by another ICHD-3 diagnosis.

- Begins after age 50 years, but may occur in younger people.
- Attacks usually last from 15 to 180 minutes
- Most patients are female

TREATMENT

- Bedtime dose of lithium carbonate (200–600 mg).
- verapamil (160 mg) or methysergide (1–4 mg at bedtime)
- One to two cups of coffee or caffeine, 60 mg orally, at bedtime may be effective.

THANK YOU

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