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HEADACHES

Classification of Headaches

- ⦿ International Headache Society (IHS)
updated 2004
- ⦿ 1. Primary- no causal pathology
- ⦿ 2. Secondary- causal pathology

PRIMARY HEADACHES

- ⦿ Migraines- with aura
- ⦿ Migraine without aura
- ⦿ Tension Type Headache
- ⦿ Cluster headache and other trigeminal autonomic cephalgias
- ⦿ Others- new persistent daily headache

SECONDARY HEADACHES

- Head/neck trauma
- Cranial/cervical vascular Dz
- Non vascular intracranial Dz
- Substance abuse/ withdrawal
- Infection
- Homeostasis
- Anatomic disorders of head/neck
- Psychiatric Dz

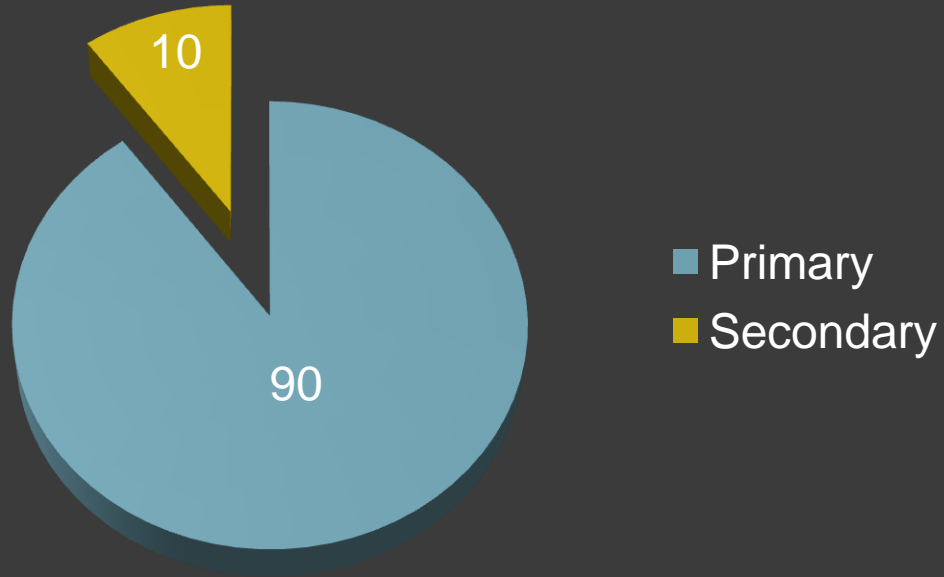
Evaluation

- Important to distinguish common symptoms from life threatening ones.
- Headache evaluation for 30 min consists of 28 min headache history and 2 min examination

Mechanisms of Headaches

- Traction on intracranial structures- PDPH
- Dilation of cranial arteries
- Intracranial– cluster headaches, anoxia, CO₂, pheochromocytoma
- Extracranial- migraine or cluster
- Inflammation- meningitis, temporal arteritis

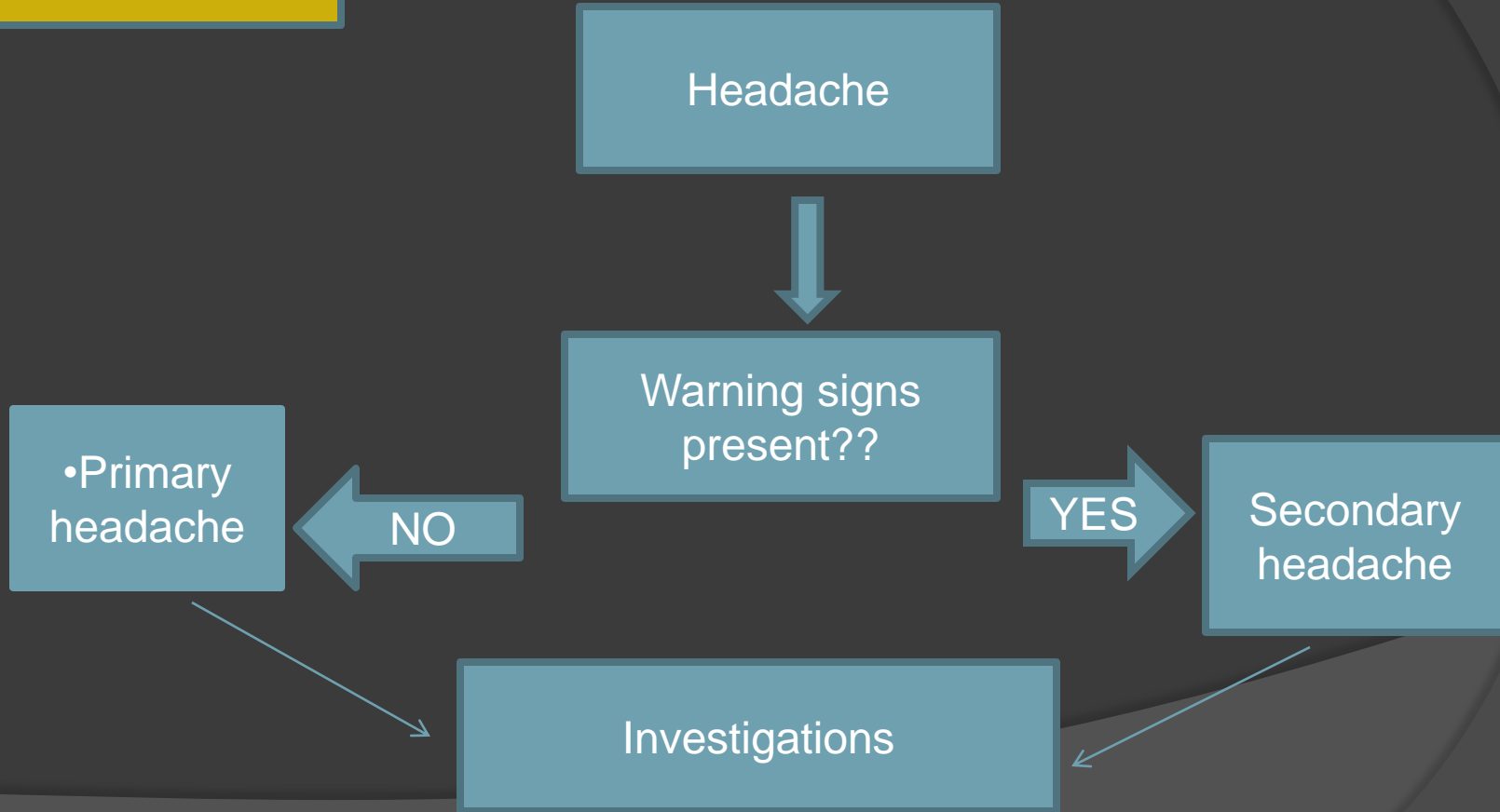
Headaches



Primary
Migraines,
Tension
type, cluster
headaches

Secondary
Tumor, Meningitis,
Arteritis

DIAGNOSTIC EVALUATION



Signs of Secondary Headaches

- ① 1. sudden onset first/worse
- ② 2. sub acute with increasing frequency/severity
- ③ 3. Headache with systemic illness-
fever/rash/neck stiffness
- ④ 4. Focal neurological signs- headache always
on the same side
- ⑤ 5. Chronic daily headache
- ⑥ 6. papilledema, cognitive
impairment, personality change, seizures

Sudden onset headache

- ⦿ Subarachnoid hemorrhage, bleed in to mass lesion, AVM, mass lesion
- ⦿ Investigation- Neuroimaging, LP after neuroimaging, not before....

Worsening Headache

- Mass lesion, subdural hematoma, medication overuse
- Investigations- neuroimaging, careful history of drug use.
- Drug screen and levels

Headache with systemic illness

- Meningitis, encephalitis, Lyme Dz, collagen vascular Dz, opportunistic infections in immunocompromised (chemo, HIV, DM, CA)

Investigations- neuroimaging, collagen vascular evaluation, LP, Immune w/u, infection w/u.

Focal Neurological Signs

- Mass lesions, AVM, Collagen Vascular DZ
- Investigation- neuroimaging, collagen vascular evaluation

Papilledema

- Mass lesions, pseudo tumor cerebri, encephalitis, meningitis
- Investigations- neuroimaging, LP after neuroimaging unless meningitis is strongly suspected and imaging not available

Primary Headaches

- ⦿ Diagnosis of primary headache(no intracranial pathology) has been defined by the IHS criteria in 1988 and modified in 2004.
- ⦿ Migraines with and without aura
- ⦿ Tension type headaches
- ⦿ Trigeminal autonomic cephalgias- cluster, paroxysmal hemicrania, SUNCT (short lasting, unilateral, neuralgiform headache with conjunctival injection and tearing)
- ⦿ Others-
stabbing, cough, exertional, sexual, hypnic, thunderclap, hemicrania continua, new daily persistent headache

Migraine without Aura Features-

- ⦿ **At least 5 attacks**
- ⦿ Lasts 4-72 hrs and occurs <15 days/month
- ⦿ **At least 2 of-**
- ⦿ Unilateral location
- ⦿ pulsating nature
- ⦿ Moderate to severe pain
- ⦿ Aggravation/avoidance of routine physical activity
- ⦿ **At least 1 of-**
- ⦿ Nausea and or vomiting
- ⦿ Photophobia or phonophobia

Migraine with Aura

- Have to satisfy the previous criteria
- **PLUS**
- At least 2 migraine attacks and fully reversible sensory, visual, speech symptoms
- **At least 2 of**
- Visual or sensory phenomena
- At least one symptom develops >5 min
- Lasts < 60 min
- Headache develops during or within 60min of aura
- No other attributable disorder

Genetic Mechanisms

- Migraine has a genetic mechanism but hereditary patterns are unknown
- Half the families with familial hemiplegic migraines show genetic linkage to chromosome 19p13. This affects P/Q type calcium channels.

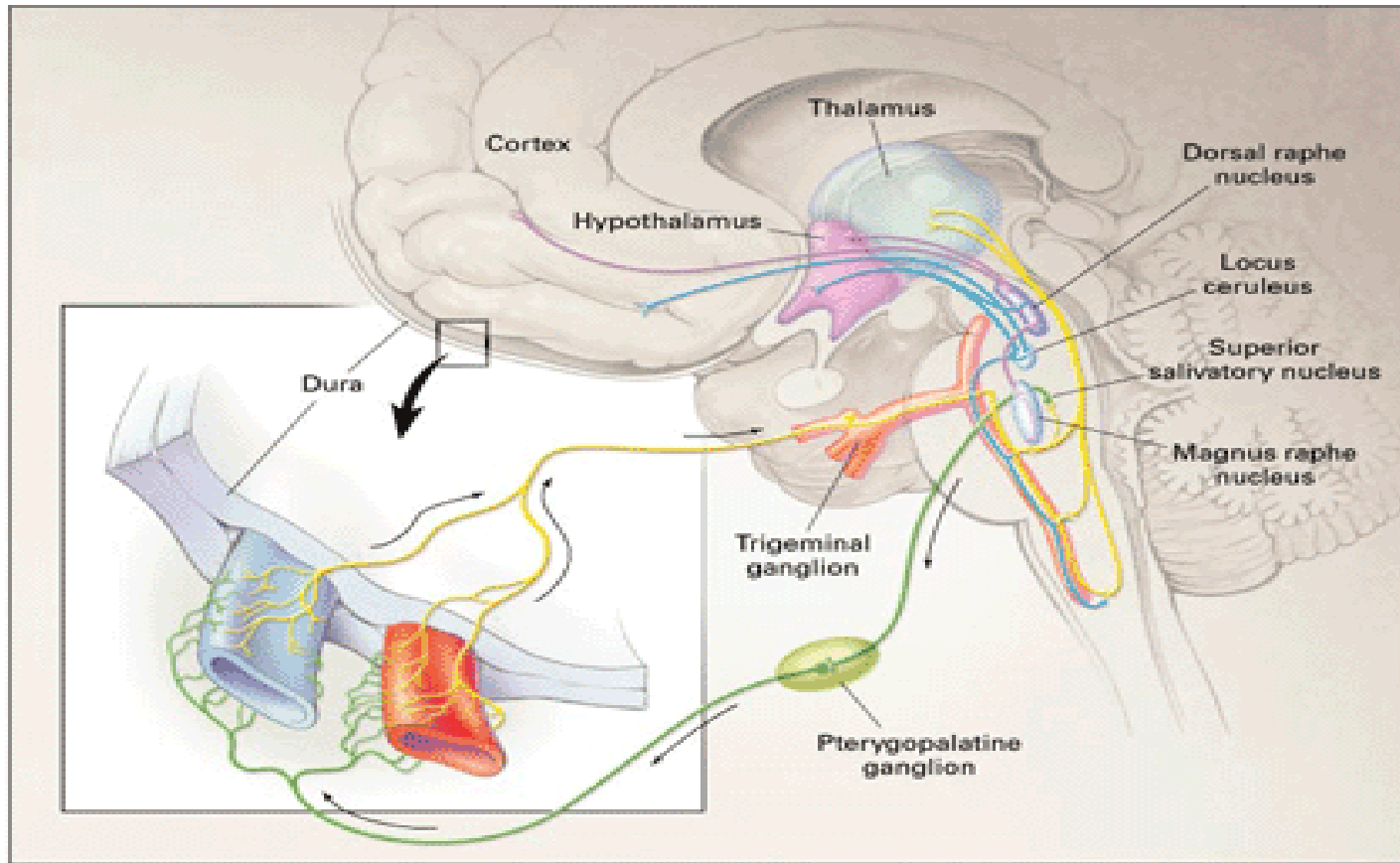
Mechanism of Migraines

- ⦿ Vascular
- ⦿ Neurogenic
- ⦿ Pet Scan- activation of medial brainstem structures during attack
- ⦿ Spreading depression during attack

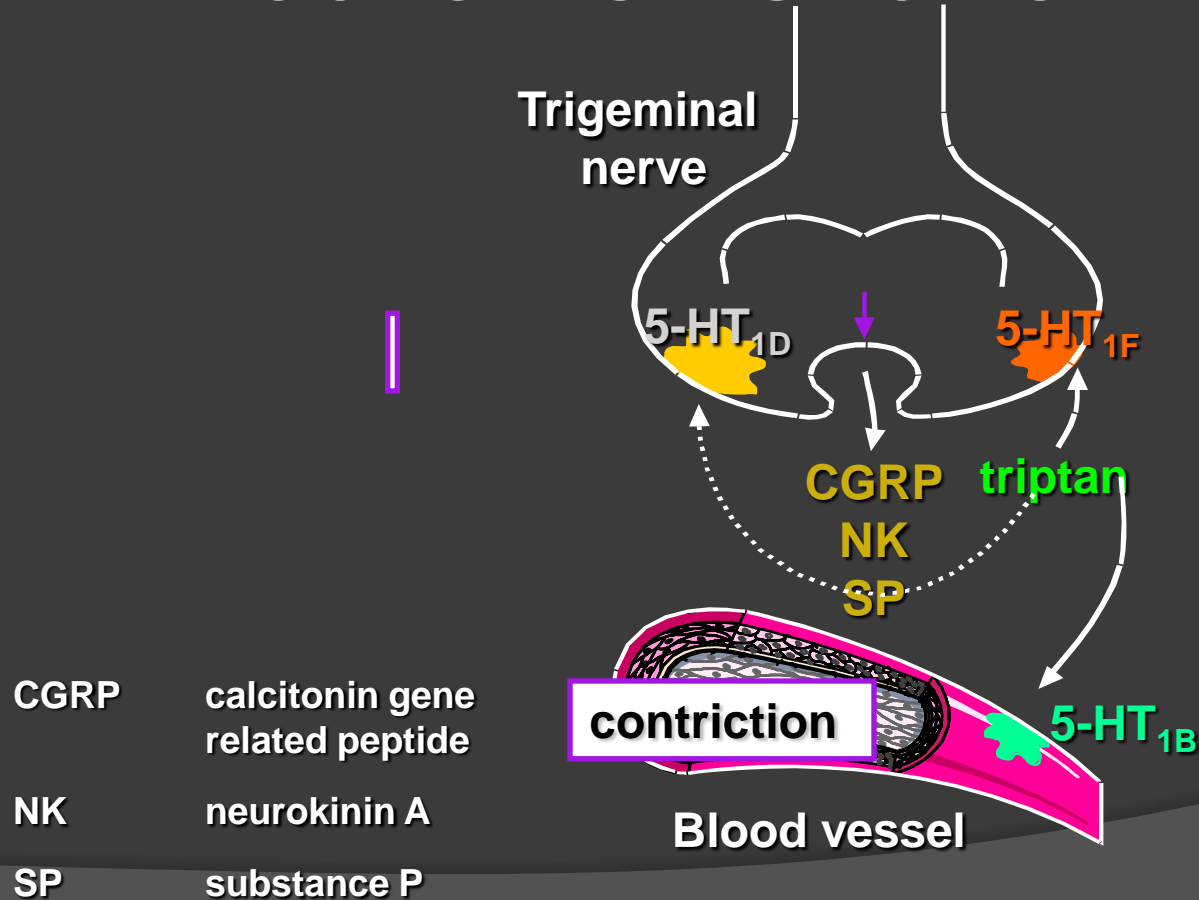
Cont.....

- ⦿ Neurovascular disorder causing dilation of pain sensitive cranial blood vessels
- ⦿ Activation of trigeminal nerve fibers that innervate these vessels releasing algescic substances. Spreading of pain along all divisions of trigeminal nerve causing ocular and facial pain. Spreading to dorsal horn of C2,3,4 causing neck pain.
- ⦿ Activation of the cranial parasympathetic outflow

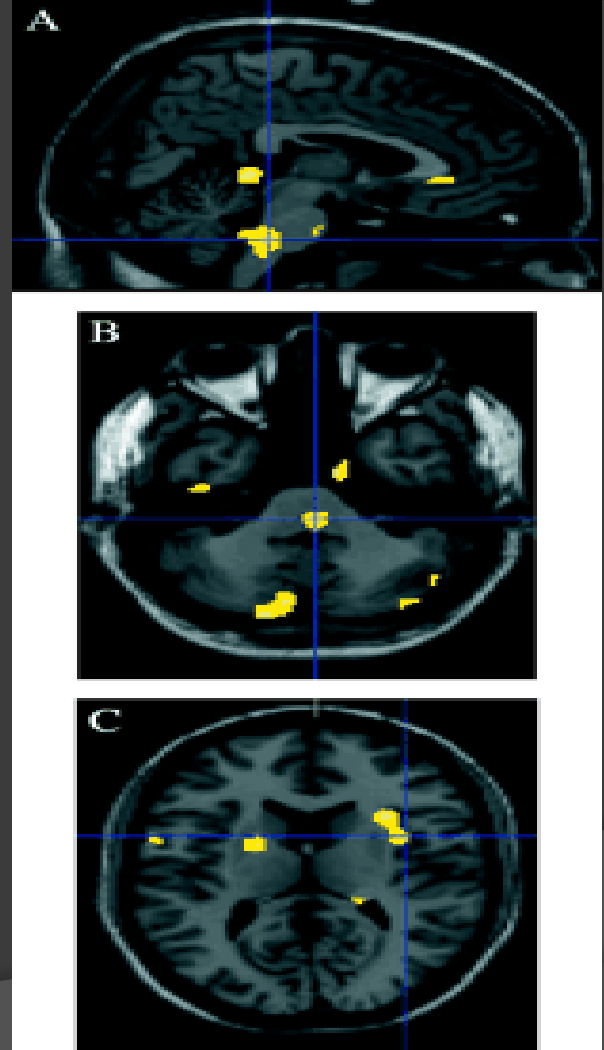
Trigeminal control of blood vessels



Mechanisms for 5HT 1D



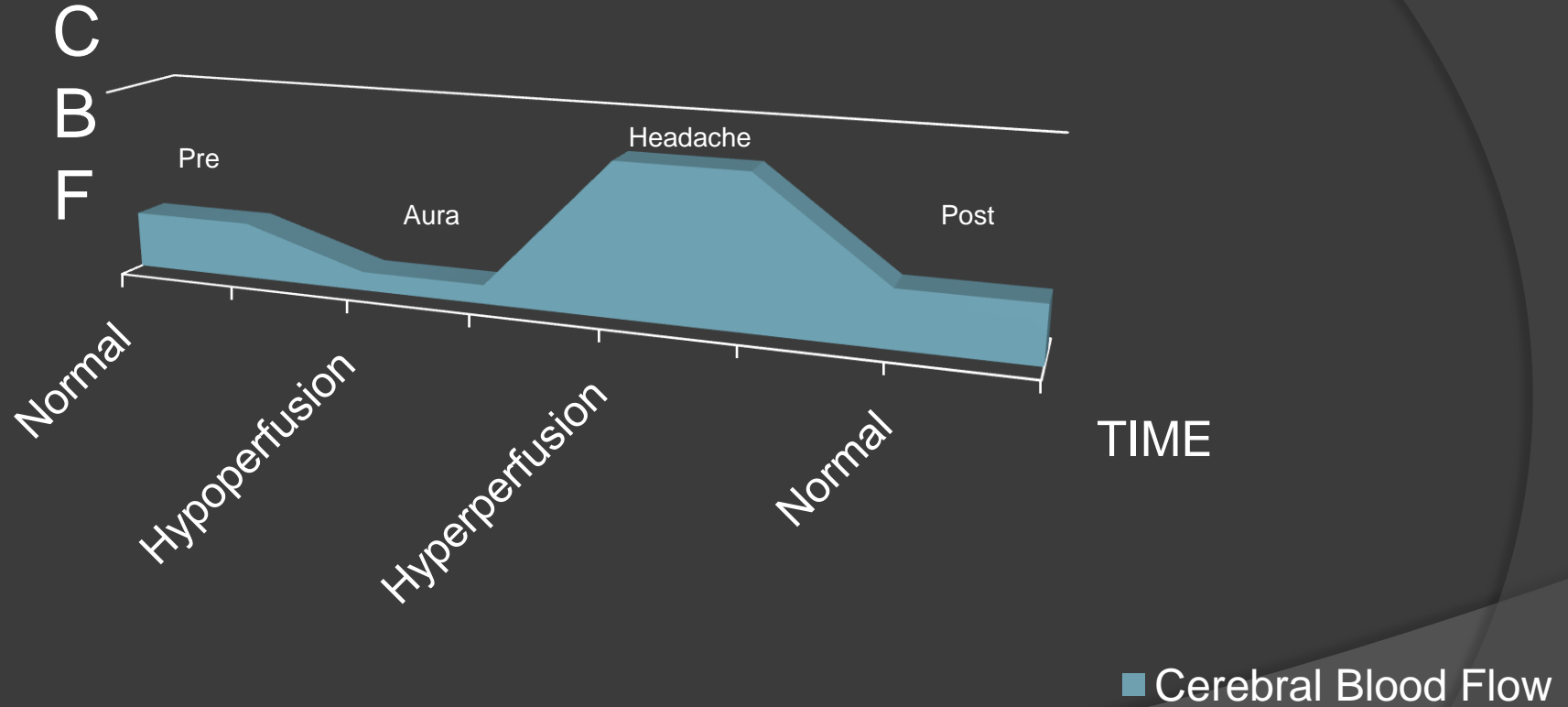
PET scan
showing
activation of
brainstem
during migraine
attack



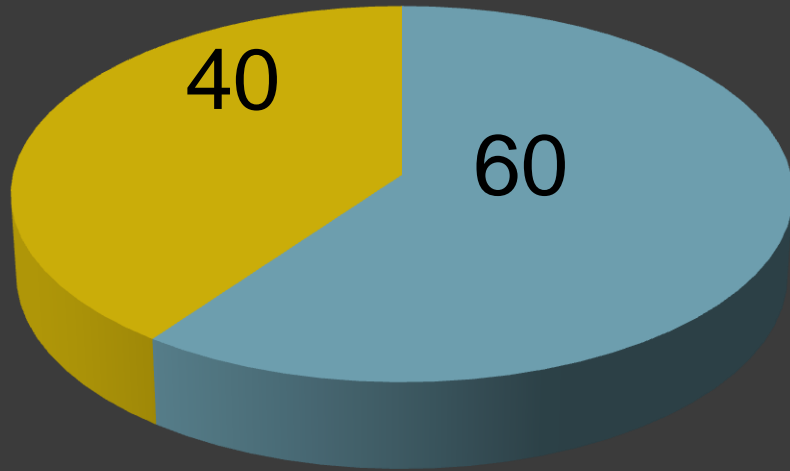
Spreading Depression

- DURING AURA THERE IS HYPOPERFUSION
- of cerebral blood flow in gray matter of the posterior part of the hemisphere on contralateral side of affected visual field or paresthesia
- Reduced CBF moves slowly across cortex anteriorly. This reduces EEG activity.
- This is called cortical spreading depression

Cerebral blood flow during Migraine



Prodrome



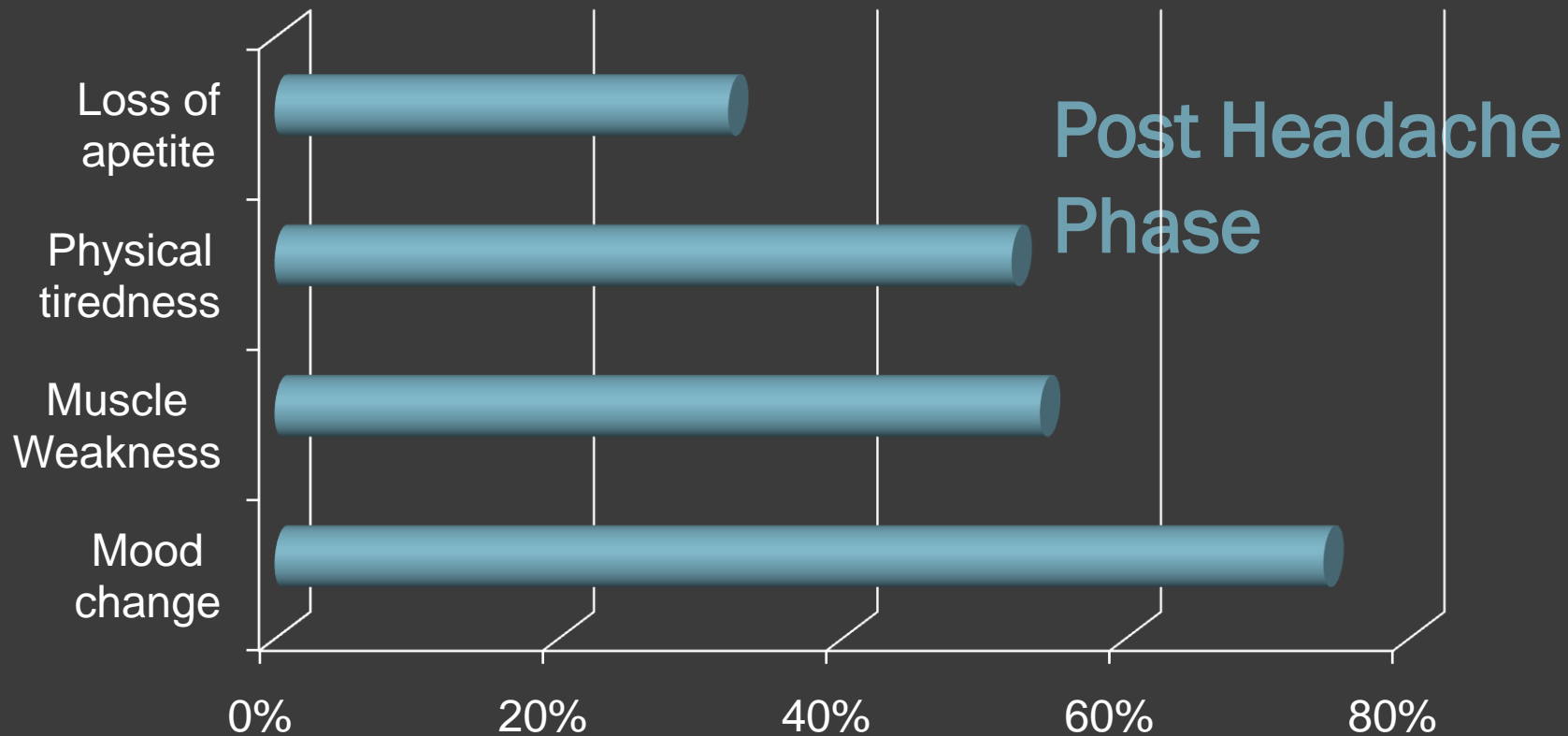
■ premonitory
symptoms

■ No premonitory
symptoms

related
Irritable
depressed
hungry
thirsty
Drowsy
25%







Comorbidities with Migraine

- ◉ Stroke
- ◉ Epilepsy
- ◉ SLE
- ◉ Reynaud's
- ◉ M.S
- ◉ Hypertension
- ◉ PFO/ MVP
- ◉ Bipolar
- ◉ Depression
- ◉ Anxiety
- ◉ Panic disorder
- ◉ Simple and social phobia

Psychiatric Comorbidity

- ⦿ Depression 25-80%
- ⦿ Resolves with effective headache Rx
- ⦿ Generalized Anxiety Disorder- 70%
- ⦿ Minnesota Multi phase personality test abnormal in 60% -predicts intractability

Treatment of Migraine

● CONSERVATIVE

- Removal of triggers-
e.g.; tyramine, sleep deprivation, hypoglycemia, OCP, PMH Rx
- Behavior mods-
- Relaxation, biofeedback, stress management, CBT

● MEDICAL

● Step care-

- 1. simple analgesics, NSAIDS
- then-
- 2. Combination Rx – butalbital/cafeine
- then-
- 3. Specific migraine therapies- triptan

Treat to severity of symptoms

- ***MIDAS disability***

- Scored questions

- Results graded

- Grade 1 score 0-5

- Grade 2 score 6-10

- Grade 3 score 11-20

- Grade 4 score 21+

- Minimal disability

- Mild disability

- Moderate disability

- Severe disability

Pharmacological Agents

- Analgesics- OTC, caffeine, nsoids for mild attacks and low Midas scores
- Abortive Rx- for severe attacks that need to be prevented from occurring- E.g.- Ergots, triptan. High Midas scores.

FDA Warning

- Using Triptan with SSRI or SSNRI can cause Serotonin Syndrome.
- It is accepted that Libby Zion law also known as the limiting of residency work hours by ACGME resulted from serotonin toxicity and death in Ms Zion due to overworked residents giving Demerol to a patient on phenelzine.(MAOI)

Prophylaxis of Migraines

- ⦿ Beta blockers
- ⦿ Propranolol
- ⦿ Ca channel blockers
- ⦿ Verapamil
- ⦿ Anticonvulsants
- ⦿ Topamax, valporate

Tension Type Headache

- ⦿ Features- At least 10 episodes occurring less than 1 day/month. No N/V, no more than 1 of photophobia or phonophobia.
- ⦿ 2 of the following
 - Bilateral location
 - Pressing/tightening non pulsatile
 - Mild/moderate intensity
 - Not aggravated by physical activity

Pathogenesis

- Similar to migraine pathology
- Precranial muscles are harder and more tender in TTH patients
- Nitric oxide synthetase inhibitor reduces headache pain and central sensitization-supporting NO mediated vasodilatation

Signs/Symptoms

- Dull, achy, bilateral, non pulsatile
- Sensation of pressing/tightening
- No aggravation by physical activity
- No N/V 1 of photo or phonophobia
- No prodrome /aura
- Severe pain is uncommon
- Musculoskeletal component

Treatment

- ***Prophylaxis-***

- greater than 2 headaches/week
- Amitriptyline
- Tizanidine
- Triptan
- Valporate, neurontin, Topamax- speculative

- ***Acute attack-***

- ASA, Tylenol, NSAID
- Combo with caffeine
- Isometheptene
- Butalbital

Cluster Headache

● Features-

- Severe unilateral peri orbital, or temporal pain.
- Lasts 15min-180min
- Lacrimation, nasal congestion, rhinorrhea,
- Facial swelling, miosis,
- Ptosis, eyelid edema,
- Conjunctival injection,
- restlessness

IHS diagnostic criteria

Episodic-- occurs in periods of 7 days to 1 yr with at least 1 month remission

Chronic-- lasts >1yr without remission

Pathology

- Trigeminoautonomic distribution of pain, autonomic features and periodicity
- Neuropeptide release- VIP, CGRP
- Neuroendocrine change- low testosterone during attacks, low TSH
- PET Scan- lights up in posterior hypothalamic grey at base of 3rd ventricle

Cluster Headache Distribution

- ⦿ Relatively uncommon
- ⦿ Men > women
- ⦿ Ages 20-30's
- ⦿ Genetic predisposition
- ⦿ Seasonal – spring
- ⦿ Most marked after 1st REM sleep

Treatment of Attack

- 100% O₂ at 10L/min--- 60% effective
- Sumatriptan SQ,IN,PO – 75% effective
- Ergotamine 1mg IV (not with triptan)
- IN lidocaine 6%-- 33% effective

Prophylaxis

- ⦿ Verapamil
- ⦿ Steroids
- ⦿ Methysergide
- ⦿ Ergotamine
- ⦿ Lithium
- ⦿ Valporate
- ⦿ ?? Neurontin, Topamax, melatonin

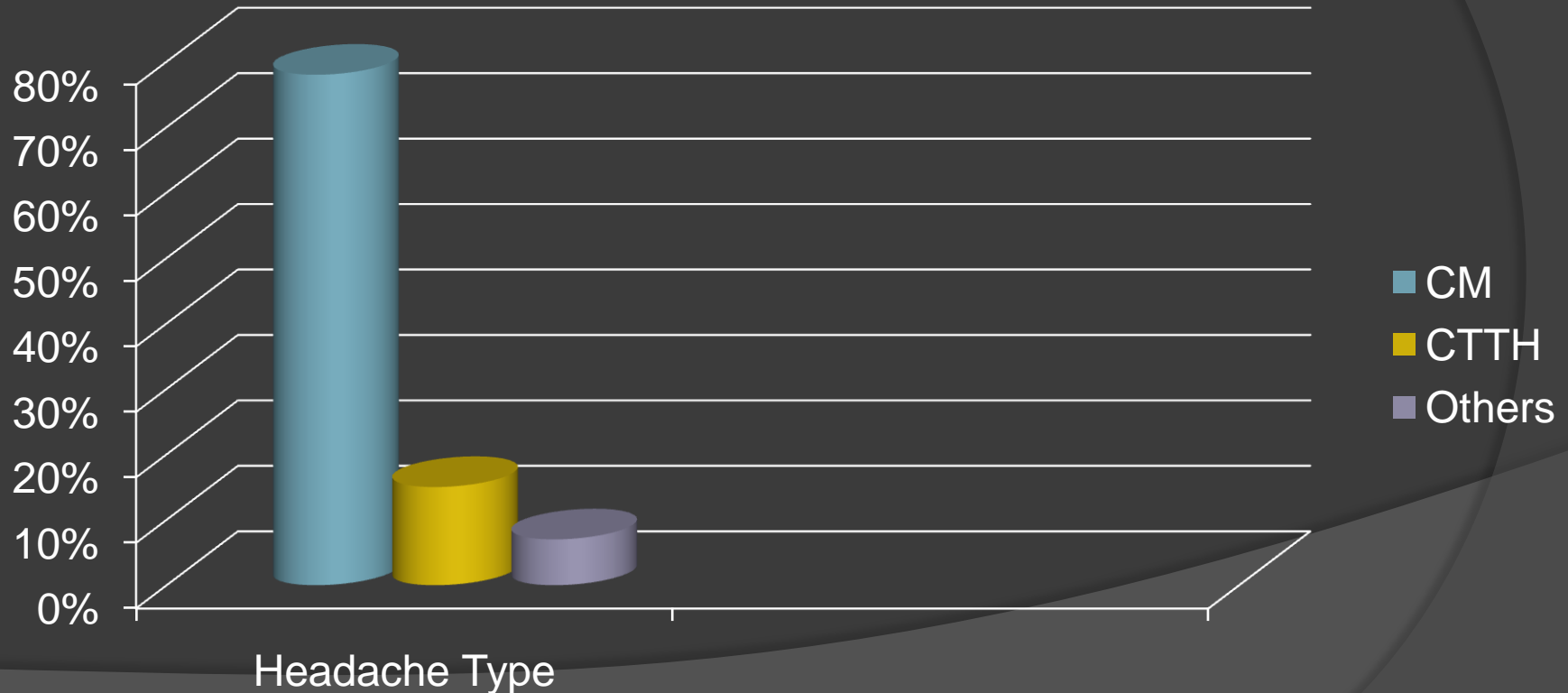
Surgical Treatment

- Occipital nerve block, sphenopalatine block
- Percutaneous RF rhizotomy of retrogasserian ganglion
- Gamma knife to ablate trigeminal nerve root
- Percutaneous glycerol rhizolysis retrogasserian ganglion
- Electro modulation of posterior hypothalamus

Chronic Daily Headaches

- ⦿ Chronic daily migraine, tension type, cluster.
- ⦿ Chronic paroxysmal hemicrania, hemicrania continua
- ⦿ New daily persistent headaches
- ⦿ Post traumatic headaches
- ⦿ Post craniotomy headaches
- ⦿ Medication overuse/ rebound headache

Chronic Daily Headache



Medication overuse/rebound

- Migraine 65%, TTH 27%, others 8%
- 80% of patients with CDH have this
- Female 3x greater than males
- Usually occurs when
analgesic use >5days/wk
triptan use >3days/wk
opiod/ergot use >2days/wk

Treatment for CDH

- ⦿ NO FDA APPROVED TREATMENT
- ⦿ TCA,SSRI,
- ⦿ B blockers, Verapamil,
- ⦿ Topamax, Neurontin,
- ⦿ NSAIS, muscle relaxants
- ⦿ Occipital nerve block
- ⦿ Botox A
- ⦿ Alpha 2 agonist- Tizanidine