

Neurology -Headache regional training course EAN

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Aburi gardens



Lecture outline

- Introduction (definition of headache)
- Differentiating between primary and secondary headaches
- Varieties of primary headaches that present in childhood and management (migraine in detail)
- Secondary causes of headache.
- Management issues including red flags in headache history
- conclusion

objectives

- To differentiate between primary and secondary headache
- Is it a brain tumour? Red flags
- What else could it be? Secondary headaches

introduction

- One of the most common problems seen by primary care doctors and neurologists
- Headaches cause concern for parents and they look for reassurance that the headache is not serious.
- 60% of adolescents and children report at least three episodes of headache a year and 8% suffer from migraine (Abu Arafah ,Razak, Dev Med Child Neuro, 2010)
- Episodic tension type headache reported in up to 20% and chronic daily headache affects 1-2% of adolescents. (Abu Arafah Arch Dis Child 2017)
- 1 out of 100 children (1%) under 5 years of age also has headaches, usually migraines

introduction

- Scanty especially in the children population
- Ofofwe G published in Headache 2010 . A cross sectional study in Benin city. Prevalence of Headache 19.5%
- One year prevalence of headache study done in rural south Tanzania was 23.1%
- 56 million people in Africa estimated to have migraine. Prevalence of migraine headache and its weight on neurological burden in Africa. A 43 year systematic review and meta analysis of community based studies. Journal of the Neurological sciences 2014. vol 342

introduction

- An almost universal experience
- Migraine in the Global Burden of Disease study (GBD2010) was ranked the third most prevalent disorder in the world!
- GBD(2015) –ranked as the third highest cause of disability worldwide in males and females under the age of 50 years

What is a headache?

- Pain referred to the forehead, orbits, temples or scalp. Does not usually cover pain isolated to the face or neck.
- Brain not sensitive to pain
- Large cerebral vessels, pial vessels, venous sinuses and dura mater all innervated by small diameter myelinated and unmyelinated neurons serving nociception

What is a headache? Mechanism of pain perception

- Signals interpreted by anatomically extensive pain matrix – thalamus, periaqueductal grey matter, amygdala, limbic system and cortical areas.
- Nociception modulated by arousal state, anxiety levels, memory, cognition , local pathology and genes.

What is a primary headache? What is a secondary headache?

- **PRIMARY** headaches are headaches that are not the result of another medical condition.
- International Headache Society classification of primary headaches include migraine, tension-type headache (TTH), cluster headache, other trigeminal autonomic cephalalgias.
- **Secondary** headache are those causally related to an underlying medical aetiology
- In children most headaches are **Primary and the most common are migraine and tension type H**

Primary headaches- Pathophysiology

- remains poorly understood
- Despite name , no evidence for “ tension” or anxiety or scalp muscle contraction in TTH
- TTH – reduced inhibitory activity of brainstem interneurons
- **Mechanism of cortical spreading depression** important in migraine
- **Results in** activation of **trigeminal neurons**

pathophysiology

- Leads to sterile neurogenic inflammation
- Plasma extravasation
- Mast cell degranulation and platelet aggregation
- Headache of migraine depends on activation and sensitization of trigeminal nociceptors innervating large meningeal blood vessels
- 50-80% of children with primary headache have an affected parent

pathophysiology

- 50% of cases of familial hemiplegic migraine associated with mutations of CACNA1A and 20% with ATP1A2.
- These suggest channelopathies compromise neurotransmission homeostasis causing auras etc.
- **Convergence theory** (like Einstein) of primary headaches implies TTH and migraine a similar spectrum with similar premonitory symptoms.
- **A headache in a child can move between migraine and TTH**

What is a chronic headache?

- Any headache experienced for more than 15 days per month for at least 3 consecutive months in the absence of a serious underlying medical condition.
- Two common types of primary headache that may become chronic are chronic migraine and chronic tension-type headache

Primary headache types

- Tension type headache **characteristically**
- **1) diffuse and symmetrical**
- **2) band like”distribution around the head**
- **3) a constant ache, but can be partially throbbing**
- **Migraine – pain usually asymmetrical**
- **throbbing or pulsatile character**
- **associated autonomic features – abdominal pain, nausea or vomiting**

Primary headaches

- Migraine – vasomotor changes like facial pallor, dark rings under the eyes
- Personal or family history of motion sickness
- **Photophobia and or /phonophobia**
- Association with lack of sleep, menstrual cycle, exam stress, (foods not important in children)
- Visual features in **migraine with aura**

Primary headaches

- Focal neurological signs and symptoms-
- Weakness, paraesthesia before, during or after headache

migraine

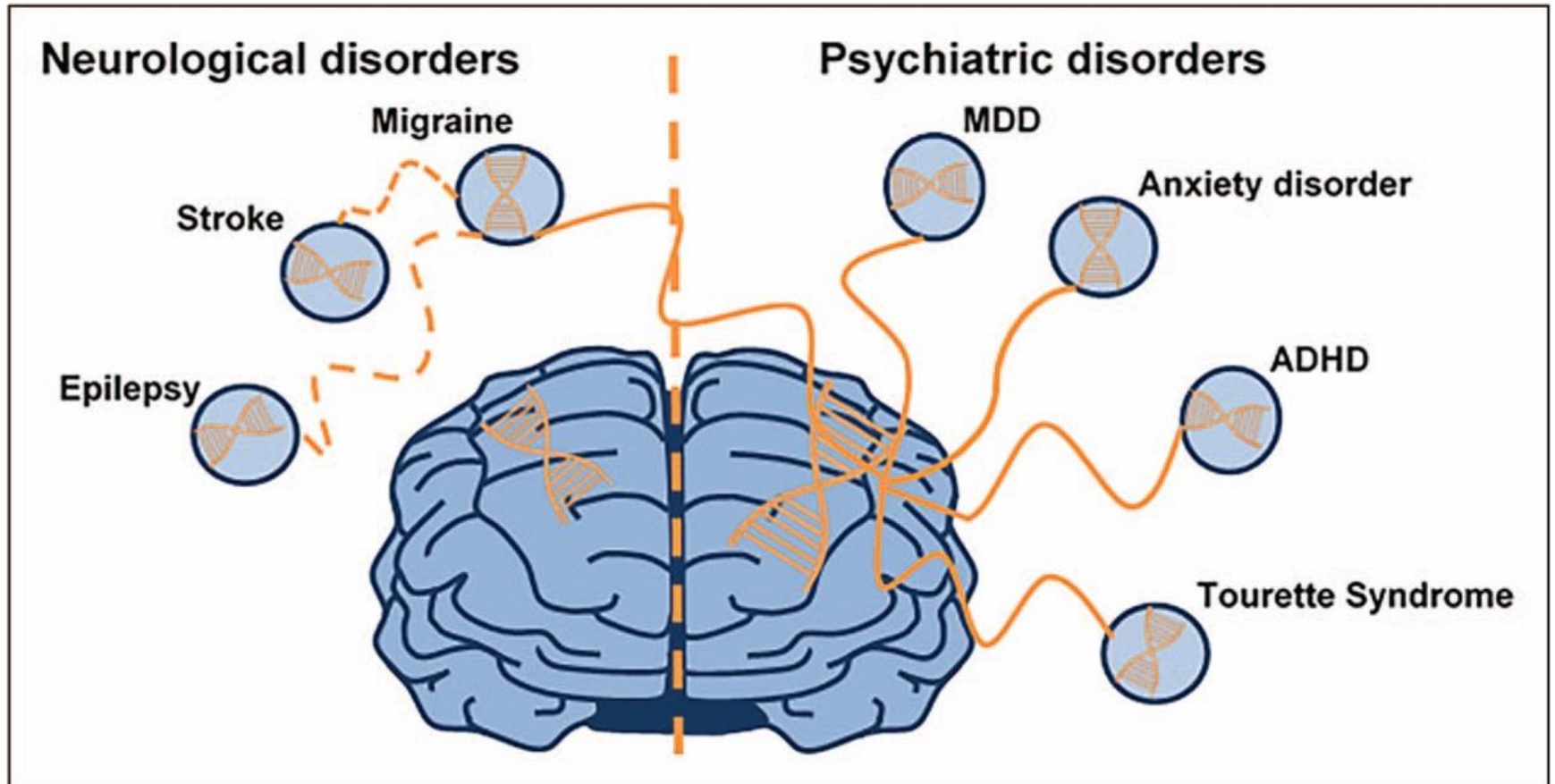
- Earlier studies in Africa in the 70s suggested migraine was a rare condition in the African!
- More recent community survey put prevalence rates between 6-9%
- Classical migraine appears rare in the African
- IHS classification recognizes 100 headache types but migraine and TTH the important ones

Shared genetic heritability between migraine and common brain disorders. Adapted from Anttila et al.[32•]. MDD, major depressive disorder.

Source

Advance in genetics of migraine

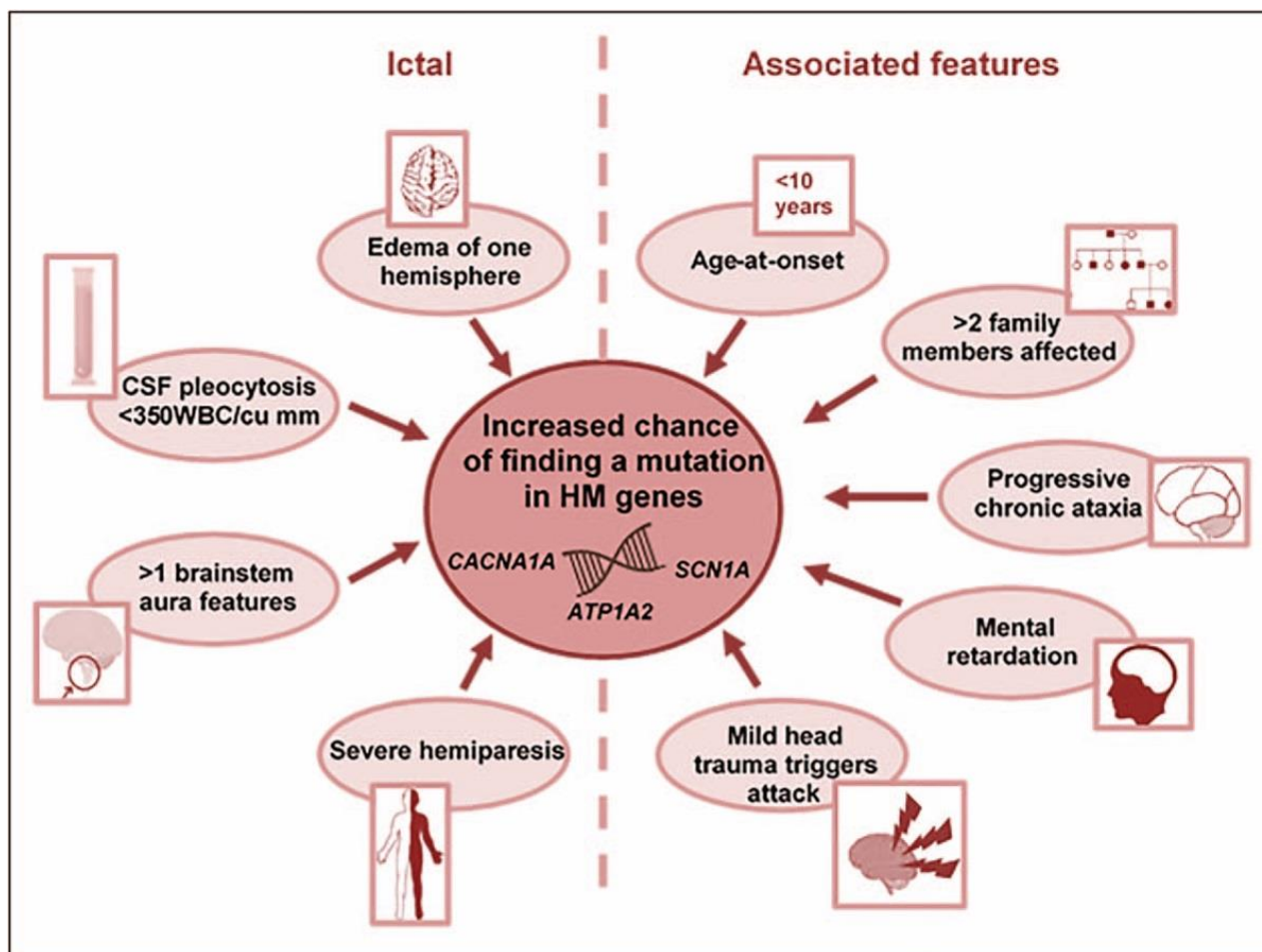
Current Opinion in Neurology32(3):413-421, June 2019.



Predictors of finding a mutation in hemiplegic migraine. HM, hemiplegic migraine; WBC, white blood cell count. Adapted from Pelzer *et al.*^[37].

Source

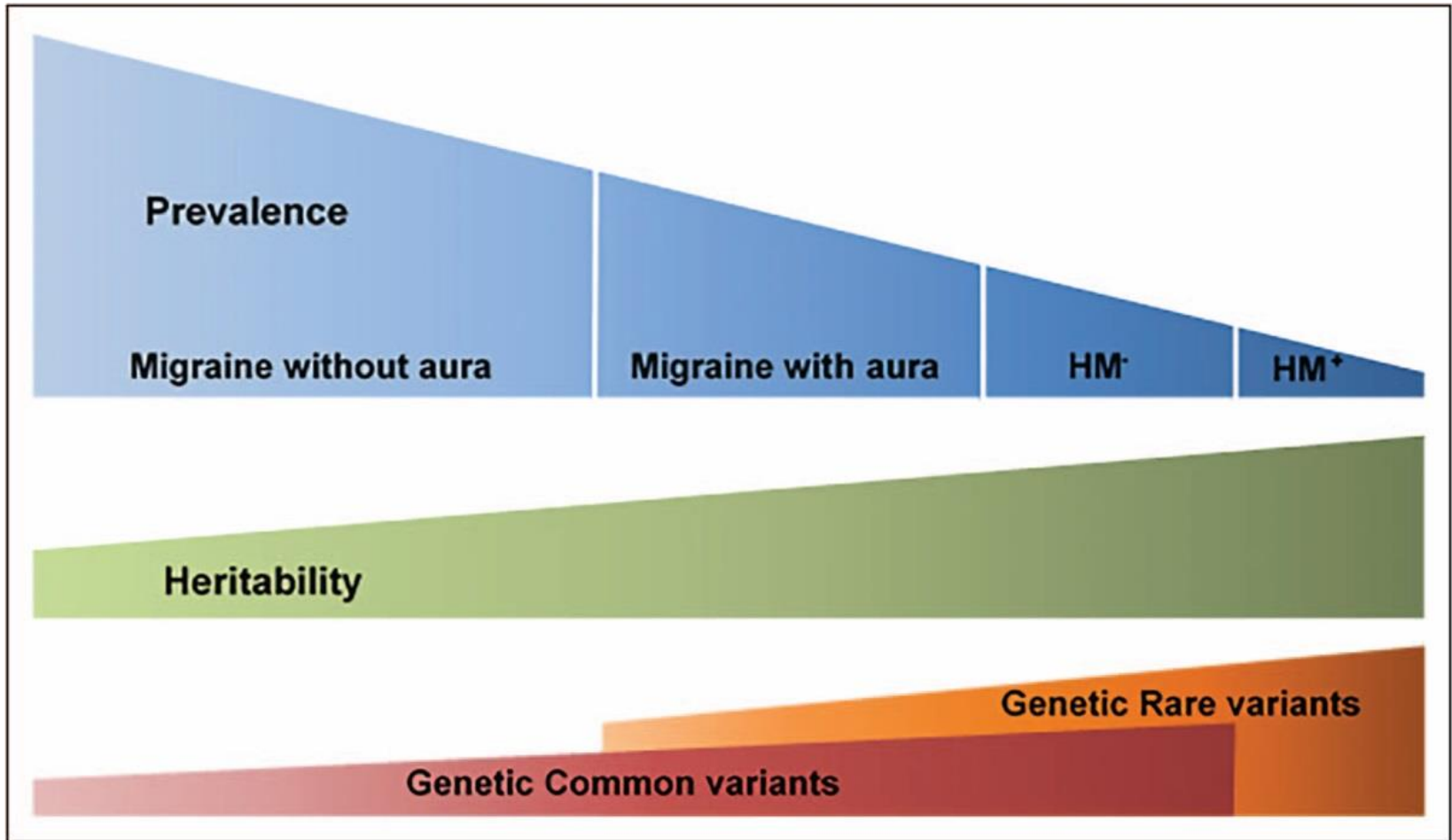
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Draw my doctor from a migraine patient 2017



genetics



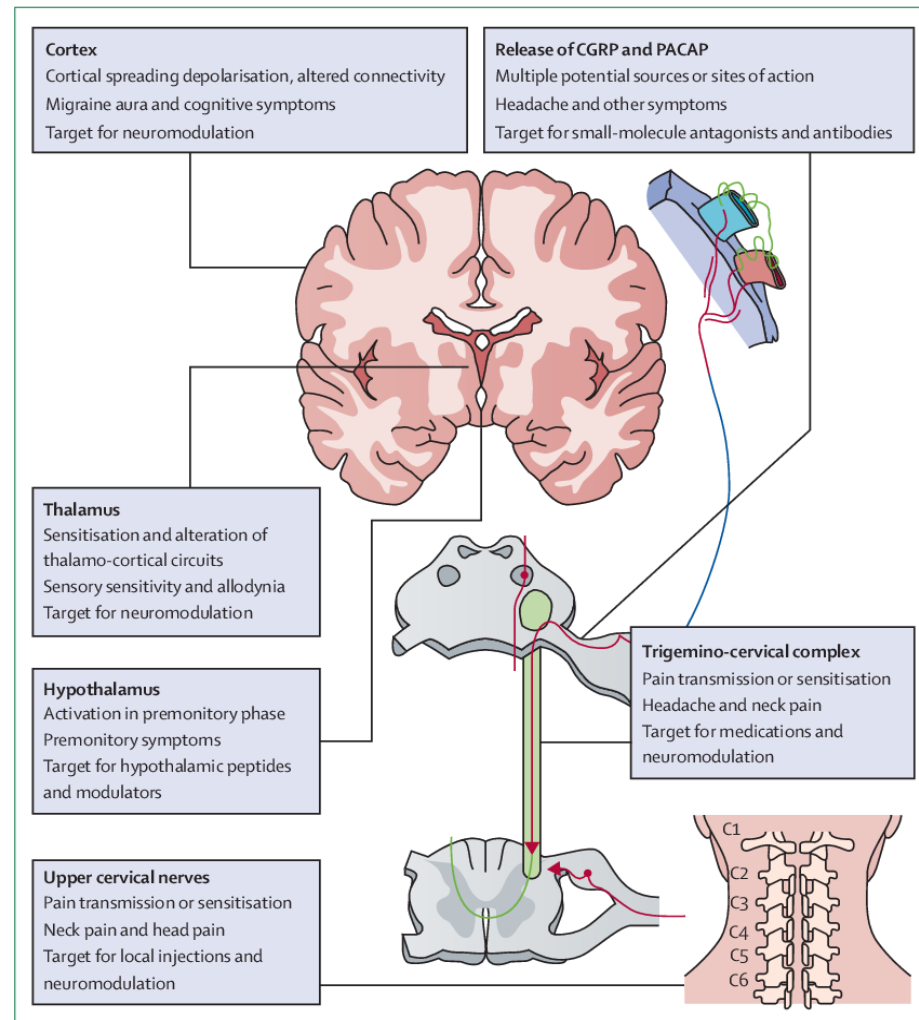
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Advance in genetics of migraine
Current Opinion in Neurology32(3):413-421, June 2019.

KEY POINTS

- Integration of genetic, phenotypic and epigenetic data will help to identify the biological mechanism by which common variants can regulate genes and contribute to the pathogenesis of migraine.
 - The genetic load, based on common polygenic variation, is higher in familial migraine cases than in nonfamilial cases, and higher for migraine with aura and hemiplegic migraine.
 - Specific clinical features of migraine seem to be determined by genetic factors. A stronger family history of migraine is associated with lower age-at-onset, higher frequency and number of medication days and the migraine with aura subtype.
 - Migraine shares common genetic variant risks with psychiatric diseases among which depression. These results highlight the importance of common genetic variation as a risk factor for brain disorders and the value of heritability-based methods in understanding their etiology.
 - Most patients with hemiplegic migraine without a mutation in the three known HM genes (*CACNA1A*, *ATP1A2*, or *SCN1A*) display a mild phenotype that is more akin to that of common migraine with aura. A major fourth gene for hemiplegic migraine might be unlikely. Thus, not all offspring of hemiplegic migraine cases seem to have an a priori 50% chance, in case of autosomal dominant inheritance, to get the disease. Mild hemiplegic migraine is likely to be caused by complex polygenic interaction of multiple gene variants with small effect and environmental factors, like in common migraine subtypes. Phenotypical features in hemiplegic migraine patients may guide physicians in selecting patients for mutation screening and in providing adequate genetic counseling.
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Pathophysiology



Migraine without aura (IHS1.1)

- Previously named “common migraine
- 80% of cases
- Uni or bilateral throbbing headache with nausea and or autonomic features (pallor)
- In children attacks are briefer than in older persons. Bilateral headache and attacks lasting less than 2 hours are common

Migraine with aura

- Aura preceded by symptoms of irritability or undefinable premonitory feeling
- Headache, nausea/photophobia normally follow the aura symptoms directly or after a free interval of less than an hour
- Visual auras include fortification spectra, cut out portions of images with smooth ragged or undulating edges
- Total blindness is rare (Bower et al 1994)

Migraine with aura

- Visual hallucinations in migraine generally linear and black and white (helps in separating it from epilepsy. Panayiotopoulos 1994)
- Aura of light headedness or vertigo common
- Usually combined with diplopia or blurred vision
- Other sensations of aura include tingling or numbness involving the hands

Migraine with aura

- Perioral area, distortions of body image (Alice in wonderland syndrome (AIWS) Golden 1979
- Coined by Todd (Can Med assoc J 1955)- refers to book Alice's adventures in wonderland published in 1865 by Charles Dogson who may have had migraine. Alice perceives herself to be
- smaller(microsomatognosia) larger, changing shape, or objects around changing size (micropsia and macropsia)
- Hallucinations and illusions in children with migraine more common than previously realized. (Smith, RA, Wright B Bennet S Arch Dis Child 2015;100:296-298
- Rarely auditory or olfactory symptoms Fuller and Guilof 1987

Complicated migraine

- Basilar type- vertigo, tinnitus, ataxia, visual disturbance (dimming of vision amounting to almost total blindness). Prognosis excellent and 13 patients followed up for 10 years by Bower et al (1994) remained symptom free
- Confusional type- often follows mild head trauma (Curtain et al 2006). Confusion lasts for hours but headache often insignificant
- Expressive or receptive aphasia

Other types of migraine

- Hemiplegic migraine
- Ophthalmoplegic migraine
- Migraine- coma

Migraine triggers

- Stress
- Relaxing after stress (exams)
- Lack of sleep
- Excitement
- Menstruation
- Food triggers like chocolates, orange juice, bananas, cola drinks etc not thought to be important in children

Chronic daily headache

- Prevalence in school age children ranges from 0.9% to 1.5% and rises to 4-6% in adults (Abu Arafah I Howells R Curr Pain Headache Rep 2014;18:401)
- 75% have chronic TTH and nearly 7% have chronic migraine
- Consider space occupying lesions and idiopathic intracranial hypertension

Chronic daily headache

- 75% approximately female
- Multifactorial disorder with migraine predilection and female sex major factors
- Precipitants (acute or chronic illness, family discord)
- Maintenance factors: eg depression, perfectionist personality type
- Medication overuse
- Neurological exam normal. Neuro imaging, lab analysis

Red flags in history indicating a space occupying lesion (adapted from Headstart campaign Bellini B et al Curr Pain Headache Rep 2013)

- Persistent headache in a child less than 4 years
- Persistent headaches that wake a child from sleep or which occur on waking
- Confusion or disorientation occurring with a headache
- Change in the character of a headache
- Change in behaviour or posture (head holding) in a child under 4 years

Red flags

- Headache with persistent nausea or vomiting for > 2 weeks
- Any persistent visual abnormality (squint, acuity changes, head tilt) and change in motor skills (clumsiness, handwriting skills, changes in foot and hand preference, focal weakness, difficulty with swallow)
- Delayed or arrested puberty or abnormal growth or head circumference

Red flags for tumours

- Excessive thirst and polyuria
- Seizures
- Personality change or deterioration in school work
- Predisposing factors for brain tumours (personal or family history of brain tumours, leukemia, early onset breast cancer, prior therapeutic radiation, neurofibromatosis 1 and 2, tuberous sclerosis

Medulloblastoma at KBU



Red flags - summary

- First severe headache
- Unclassified headache
- Accelerated course
- Headache mainly lying down or asleep or bending down , straining or coughing
- New neurological signs- ataxia, cranial nerve deficit, head tilt, papilloedema, visual impairment
- Convulsions/ epileptic seizures

Features of brain tumours: a review of 200 cases Wilne SH, Ferris R Nathwani A. Arch Dis Child 2006.91:502-506

- Headache – 41% first symptom (FS) 56% at some time (AST)
- Vomiting 12% FS 51% AST
- Unsteadiness 11% FS 40% AST
- Visual difficulties 10% 38% AST (double vision, blurred vision)
- Educational and behavioural problems 10% ** 44% at some time (irritability aggression, labile emotions, aggression. Deterioration in reading and writing, memory difficulty. Poor concentration, decrease in school attendance)
- seizures

Continued –review of tumours

- Focal weakness
- Increased OFC
- Growth/endocrine
- Neurological signs- papilloedema, cranial nerve abnormalities, cerebellar signs, long tract signs, reduced level of consciousness
- Cerebellar signs were the commonest sign in isolation. Next common were cranial nerve abnormalities

Chronic headaches – chronic analgesia over use headache

- Consider in patients developing a chronic headache who had previously episodic TTH, migraine without aura, or migraine with aura while taking the ff. triptans, ergot alkaloids or combination analgesics on > 10 days of month
- Paracetamol, aspirin or NSAID drug on > 15 days a month.
- Co codamol and compound analgesics usually the culprit

Analgesia overuse headache

- All patients with a primary headache should be warned about this.
- Suspect when family look at the watch to see when child can have another dose!
- Explain problem and need to change pattern of analgesia
- Migraine prophylaxis may be helpful here

Childhood periodic syndromes/migraine variants

- Cyclical vomiting – recurrent stereotyped episodes of vomiting and intense nausea associated with pallor and lethargy (hours to days)
- Abdominal migraine: episodic midline abdominal pain of moderate intensity lasting 1-72 hours associated with vasomotor symptoms , nausea and vomiting
- Benign paroxysmal vertigo – abrupt and transient vertigo and often emesis-dizziness, ataxia, pallor and vomiting (minutes)
- Benign paroxysmal torticollis- head tilt, ataxia, irritability, pallor , vomiting (hours to days)

Cluster headache and other trigeminal autonomic cephalalgias

- Uncommon in adolescence and very rare under 10 years
- Cluster headache chronic paroxysmal hemicrania (CPH) , short lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT)
- **Cluster headache:** characteristic periodicity, extreme pain, usually not throbbing

Cluster headache /TIC

- Cluster headache typically lasts up to 3 hours
- SUNCT characterised by stabbing or burning eye pain
- Association with ipsilateral autonomic disturbance such as conjunctival injection, lacrimation, nasal congestion, rhinorrhea, forehead and facial sweating, ptosis or eyelid oedema

CLUSTER HEADACHE /TIC

- 90% FEMALE
- Verapamil replaced traditional prophylaxis
- (methysergide should be used only for 6 months because of retroperitoneal fibrosis
- Acute episodes treated with sumatriptan, indomethacin or inhalation of oxygen.
- High flow (12l/min) of 100% oxygen by a non breathing face mask with a reservoir bag very effective acutely

Painful cranial neuropathies/facial pains

- Painful ophthalmoplegic neuropathy (HIS 13.9)
- Preferred to old term ophthalmoplegic migraine
- Repeated episodes of paresis of oculomotor nerve with ipsilateral headache
- Headache can precede third nerve palsy by up to 2 weeks
- Treatment with steroids shortens episode duration and reduces risk of incomplete recovery
- Inflammatory basis from MRI studies

(cont)

- Tolosa hunt syndrome (IHS13.7)
- Unilateral orbital pain with paresis of cranial nerves III, IV, V.VI. VII. VIII
- Granulomatous inflammation in cavernous sinus, superior orbital fissure.
- Exclude tumours, basal meningitis and diabetis mellitus
- Pain and paresis resolve with corticosteroids

MANAGEMENT OF PRIMARY HEADACHES

- A detailed history is the cornerstone of the chronic headache assessment.
- Given that chronic headache is primary no imperative to offer neuroimaging.
- Be aware of risk of over investigation

Key features in chronic headache history

- Onset, frequency , timing, nature, assoc features, (vomiting, visual disturbance, behavioural change, seizures)
- Usual management of the headache, look for positive reinforcement or secondary gain
- Use of analgesia or other drugs for Headache
- Effect on sleep, appetite, mood activity (both school and recreation)

Features in headache history

- **Current functioning.** New coordination problems, gait changes, hand preferences, squint, abnormal movements, mood change or lethargy, swallow or speech problems, double vision, change in school performance, seizures
- **Medical history:** history of malignancy, exposure to radiation, rhinitis, dental issues, history of head trauma or whiplash

Key features in C H history

- **Drug history:** prescribed, over the counter, herbal, alcohol and recreational. Do not forget contraception. Any recent cessation of drugs
- **Development:** learning disability, visual impairment, last opticians visit
- **Systems review:** gastrointestinal –vomiting (especially early morning,) bowel habit, abdominal pain
- Nutrition- regular meals, appetite, recent weight loss

history

- Hydration- adequate fluid intake, consumption of energy drinks?
- Endocrine- growth abnormalities or pubertal issues. Ask about polydipsia and polyuria.
- ENT- facial pain, earache, discharge, nasal discharge
- Psychiatric- establish overview of child's personality and coping strategies

history

- Perfectionist or overachiever? Symptoms of anxiety? Like rapid heartbeat, difficulties concentrating, chest pain, stomach ache
- Dental – toothache, teeth grinding,
- Sleep – sufficient?
- **Social history:** recent changes (house moves, bereavements, divorce, financial hardship, parental illness . Abuse a possibility too?

history

- School- learning,enjoyment, relationship with peers, bullying
- **Activities/lack of sufficient relaxation time:-** relationships with family, peers , sexual relationships
- **family history:** psychiatric conditions (anxiety and depression) , malignancy, headache and chronic pain

Headache intensity (severity) cephalgia 2013

.33:629-808. classification committee of IHS

- 0 - no headache
- 1- mild headache: does not interfere with usual activities. Carries on with work or play
- 2- moderate headache: inhibits but does not wholly prevent usual activities. For example stops playing and just watches a film
- 3 – severe headache: prevents all purposeful activities - just lies down quietly or sleeps

Neurological exam of children under 5

(from Edgar et al. short cases for the MRCP)

- Inspect- dysmorphic features, posture, movements, head shape and size
- Signs of precocious puberty, muscle wasting , scoliosis, neurocutaneous markers
- Cranial nerves 11, 111.1V, V1
- Eye contact, eye movements, pupil reaction to light, nystagmus, ptosis, visual fields, fundoscopy

Neurological exam in children

- Check other cranial nerves
- Upper limb and lower limbs- observe gait
- Look for deformity, muscle bulk , posture
- Feel for tone
- Test power
- Observe coordination in play
- Test reflexes

Assessment of the impact of the headache

- School absenteeism
- Parental time –off work
- Missed recreational opportunities for child and family
- Impact on relationships, family and peer
- Effects on mood, appetite , weight and sleep

Precipitating or trigger factors in chronic headache

- Use of medications (overuse of analgesia defined as use of triptans, ergots or opioids for more than 10 days per month, for greater than 3 months or any other analgesic for more than 15 days per month).
- Suboptimal sleep
- Dietary factors- skipping meals especially breakfast
- Exercise- high expectations of sporting achievements
- Caffeine
- Stress (parental discord, bullying, academic pressures)
- Abuse (emotional, sexual, physical/recreational drugs)
- Psychiatric (anxiety and depression)

Management of primary headaches

- **Simple explanation** of nature of primary headache disorders. The more child and family understand the less they worry
- **Explain periodicity** – good and bad spells
- **Learn to identify own precipitating and exacerbating factors**
- Give opportunity for the asking of questions (worries about tumours, etc. family's consultation agenda may not match your own

Management of primary headaches

- Too many investigations usually not required.
- **General lifestyle advice:**
- Dietary triggers overestimated. Relevant during a bad spell.
- Excessive consumption of caffeine and cola
- Good sleep hygiene helpful
- Understand different roles for prophylactic and acute medication just like in asthma

Rescue treatment-migraine with and without aura

- Paracetamol and NSAIDS similar in efficacy
- Take medicines before onset of nausea and gut dysmotility.
- Paracetamol 20mg/kg 4-6 hourly max 75mg/kg day (0-11 years)
- Per rectum 40mg/kg then 20 mg/kg 4-6 hourly
- 10-50kg - IV 15mg/kg 4-6 hourly
- >50kg 1g 4-6 hourly

Rescue treatment

- **Ibuprofen**
- 2-6 years oral 100mg three times daily
- 7-11 years – 200mg three times daily
- 12-18 years 400 mg three times daily
- **Diclofenac**
- 1-18 years oral/pr. 0.3-1mg/kg three times a day
- 2-18 years IV/IM 0.3-1mg/kg twice daily

Rescue treatment

- Ketorolac (NSAID)
- 1-15 years IV slow 0.5-1mg/kg stat then 0.5mg/kg 6 hourly
- Naproxen effective in my experience

triptans

- Class of serotonin (5 –hydroxytryptamine) 1B/1D/1F receptor agonists
- Exert a particular antimigraine attack effect
- Level at trigeminovascular system probably
- **Offer a triptan . Example sumatriptan or zolmitriptan.(now available in nasal or oral prep)**
- **3 different triptans should be tried before accepting that this class of medicine ineffective**
- **Can use in primary school age off label**

antiemetics

- Cyclizine
- Domperidone
- prochlorperazine

treatment- migraine with or without aura, TTH,
chronic TTH chronic migraine Prophylactic

- Consider when headaches affect daily life
- Missing significant school, sports activities
- Headache fortnightly or more frequently
- **Propranolol**
- First choice if no history of asthma
- Second line – topiramate and valproate
- Other drugs are gabapentin, amitryptiline, pizotifen. Riboflavin (B2) Limited evidence of efficacy in children




prophylaxis

- Start with a low dose and build to target dose in 2 weeks.
- Maintain until in remission for at least 6 weeks and then withdraw over a further 6 weeks
- Evidence for complimentary medicine /alternative medicine poor. feverfew

New drugs on the horizon?

- Calcitonin gene related peptide. A neuropeptide with potent cerebral arteriolar dilatation properties
- Gepant – modulates central and peripheral pain circuits. Ubrogepant now in phase 111 trials
- **Ditans** -5 HT 1F receptor agonists. Lasmiditan
- Preventive. CGRP monoclonal antibodies eg galcanezumab.
- Neuromodulation- **occipital nerve stimulation**. Modest efficacy rate
- **Sphenopalatine ganglion stimulation**

Main randomized controlled trials for non-invasive neuromodulation in migraine

Device	Mode of action	Image	Published RCTs	Participants (number, type)	Treatment type	Ongoing studies
springTMS	Single-pulse transcranial magnetic stimulation		Lipton et al. 2010 (53)	n = 164 Episodic migraine	Acute	NCT02357381 Preventive /Acute treatment
gammaCore	Transcutaneous vagus nerve stimulator		Silberstein et al. 2014 (49)	n = 59 Chronic migraine	Preventive	NCT02686034 Acute treatment; NCT02378844 Preventive treatment
Cefaly	Transcutaneous supraorbital stimulation		Schoenen et al. 2013 (40)	n = 67 Chronic migraine	Preventive/ Acute	NCT02590939 Acute treatment
tDCS	Anodal transcranial direct current stimulation		Auvichayapat et al. 2012 (58)	n = 37 Episodic migraine	Preventive	NCT02122757 Preventive treatment

Behavioural and cognitive approaches

- If headache chronic non pharmacologic approach likely to be effective
- Assess triggers or predisposing factors operating in child's home or school
- Unrecognized academic difficulties, difficulties with peers, home related stress common
- Depression may be a contributing factor
- Chronic analgesic overuse

Lifestyle advice

- **Encourage** full participation in work and play activities as possible
- **Regular and sufficient sleep**
- **Regular rest and relaxation**
- **Regular meals (breakfast)**
- **Adequate hydration**
- **Regular exercise**
- **Discourage** – prohibitions on normal activities, foods or drinks unless clear evidence that harmful

CAUSES OF SECONDARY HEADACHE

- In Sub saharan Africa in general think of ENT, ophthalmologic and infectious causes
- Meningitis /encephalitis
- Malaria
- Typhoid
- Pneumonia
- TB
- Dental infections
- Epilepsy (peri ictal headache)
- Undiagnosed hypertension

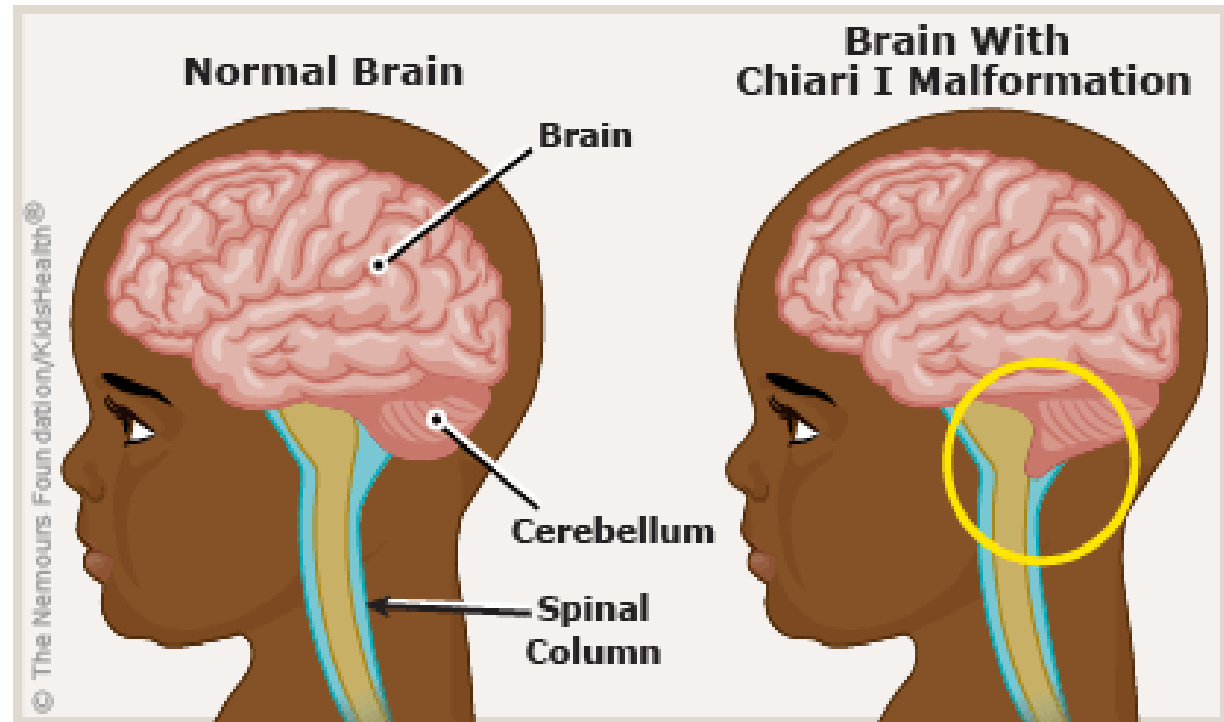
Secondary causes of headache.

- Idiopathic intracranial hypertension -
- Frontal/retro-orbital headache. Features of raised ICP (worse with valsava manoeuvre)
- Associated tinnitus
- Papilloedema (often)
- Obesity. Common in girls
- INV and Mx. Imaging, LP and pressure monitoring, ophthalmology. Consider optical coherence tomography

Secondary causes of headache

- **Related to Chiari type 1 malformation**
- Occipital headache with features of raised ICP
- Headache chronically progressive Precipitated by cough or valsava manouevere.
- Neck pain
- Bulbar signs (stridor, dysphagia and tongue wasting)
- Cerebellar signs (nystagmus, past pointing and ataxia)
- Central spinal cord symptoms (hand tingling or numbness) association with syringomyelia.

Chiari type 1 malformation



Secondary causes of chronic headache

- Investigations and Mx – MRI head and cervical spine
- Refer to neurosurgeon. Note . Surgery unnecessary in patients with asymptomatic CM1.

Secondary causes

- **Trauma or concussion**- history of head injury or whiplash
- poor sleep or post traumatic stress disorder may contribute
- **Vascular (AVM)** – typically presents with cluster headaches (one sided around the eye)
- Presence of skin angioma and bruits
- Inv and MX- MR angiography and MR venography

Secondary causes of headache

- **Exposure to substances** – carbon monoxide, alcohol, cocaine, oral contraceptive pill, monosodium glutamate
- Full drug history and dietary history
- MX.- withdrawal of substance
- Substance withdrawal eg caffeine, oral contraceptive pills, opiod.
- MX.- support through withdrawal of relevant substance

Secondary causes

- **Related to epilepsy**- recurrent seizures can cause headache .
- **Mx.** Optimize seizure management
- **Specific medical conditions**- sleep apnoea, dialysis, pheochromocytoma, hypertensive encephalopathy, liver or renal disease, coeliac disease, vitamin D deficiency , anaemia
- **Mx.** Refer to appropriate specialist

Secondary causes

- Fasting - dietary history reveals it.
- **Eye** – glaucoma, refractive errors . Ask about eye pain, acuity, visual disturbance
- MX. Refer to ophthalmology
- **Ear nose and throat conditions**
- Rhinosinusitis, sinusitis, tonsillitis. Nasal symptoms, perennial rhinitis

Secondary causes

- **Dental** – dental caries, bruxism, temporomandibular joint problems
- **Psychiatric disorders**- somatisation, as part of psychiatric disorder(depression or anxiety)
- Look for mood changes, tearfulness, anxiety (palpitations, nausea, chest pain, abdominal pain).
- MX- refer to psychology team

Secondary causes

- Evidence to support relaxation training, hypnosis, coping skills training (eg assertiveness), biofeedback, cognitive behavioural therapy.
- Self help cognitive behavioural material available on line. Free app called “mindshift”.
- Several online sources

conclusion

- Management of children and young people with headache depends on the correct diagnosis and differential diagnosis
- Chronic headache is a common presentation
- Rule out secondary causes as shown above
- Avoid unnecessary investigations
- Develop a management plan

Sources /reference material

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