Headache in pediatrics

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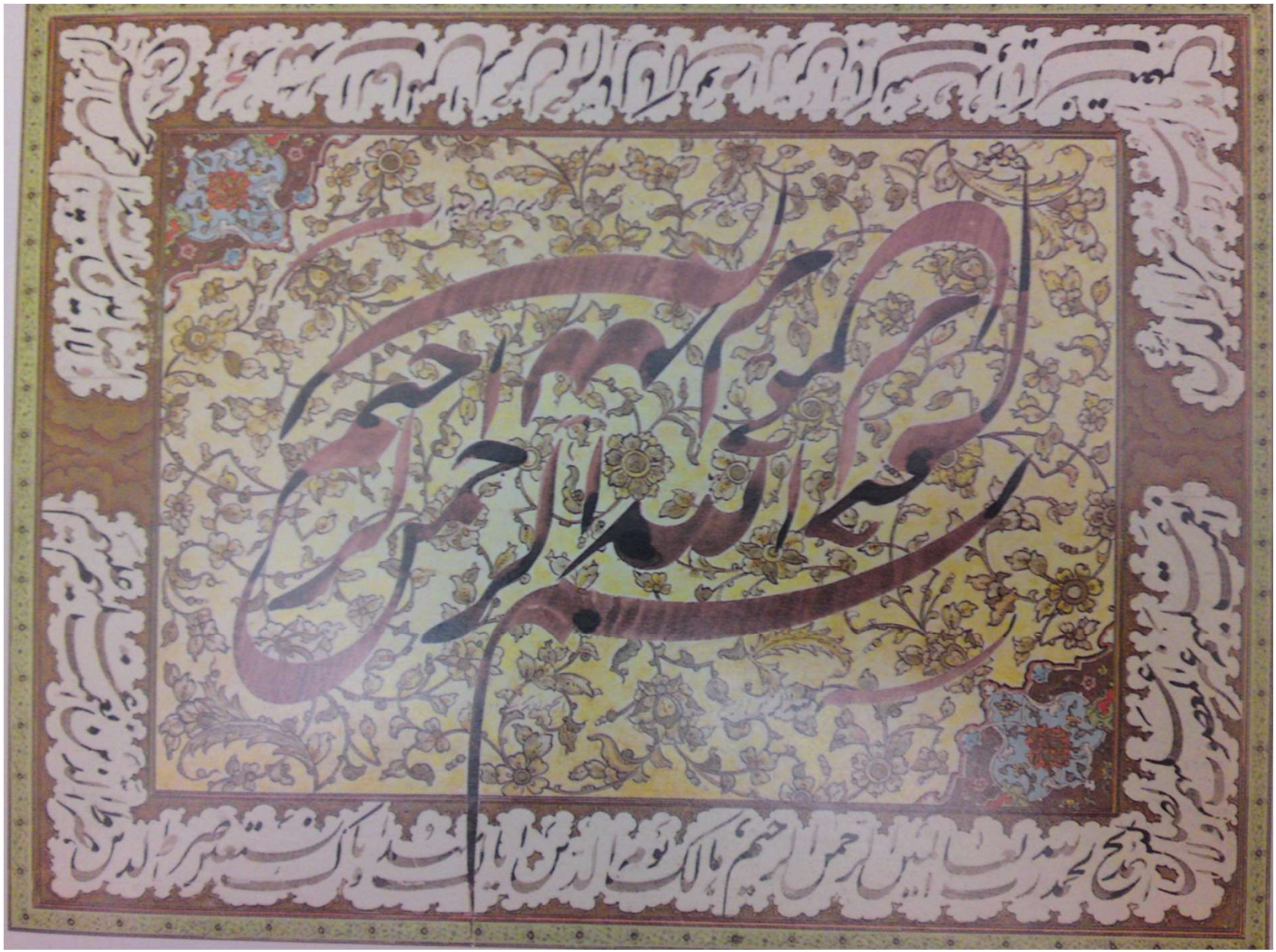

INTRODUCTION

- Headache is one of the most common complaints in children and adolescents.

- prevalence increases with age. Children who complain of headache usually are brought to medical attention by their parents due to missing school or social activity or concerns of an ominous etiology such as a brain tumor or an untreatable cause

EPIDEMIOLOGY

- nearly ۶۰ percent of children reported having had headaches over periods of time. By age ۱۸ years, more than ۹۰ percent of adolescents report having had a headache

- The prevalence of recurrent headaches increases with age from ۴٫۵ percent among children ۴ to <۶ years to ۲۷٫۴ percent among children ۱۶ to ۱۸ years
  Before ۱۲ years of age, the prevalence of headaches is similar among boys and girls (approximately ۱۰ percent). After age ۱۲ years, the prevalence is higher in girls

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Prevalence of Headache in 11 to 18-Year-Old Students in Isfahan, Iran

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Abstract

Background: Headache is one of the most common complaints in childhood and adolescence. However, few studies have been conducted concerning different types of headaches and their importance, particularly among Iranian students. The present study aimed to determine the prevalence of various types of headaches and their related factors among 11 to 18-year-old students of Isfahan, Iran.

Methods: This cross-sectional study was performed on 4096 students who aged 11 to 18 years old during 2006-09. Stratified, cluster random sampling was used to select student from junior high schools, high schools, and pre-university schools in Isfahan. Required data including types of headaches, comorbid symptoms, and factors related to headaches were collected by referring to a physician through interviewing and completing a questionnaire.

Findings: Out of 4096 subjects, 2047 (49.9%) had headaches. The frequency of total headaches, migraine headaches, and tension headaches were significantly higher among girls compared to boys (60.4% vs. 39.4%; $P < 0.01$; 27% vs. 11.5%; $P < 0.01$; and 33.2% vs. 27.1%; $P < 0.01$, respectively). On the other hand, cluster headache was more common in male students than in females (39% vs. 0%; $P = 0.01$). In both sexes, the frequency of headache significantly increased with increasing age. While in most of female students (80%), the incidence of headache was not associated with a certain season, in male students, the incidence of headache was higher in winter (37.1%). There was a significant difference between female and male students in some factors related to the incidence of headache ($P < 0.05$).

Conclusion: Approximately half of 11 to 18-year-old students of Isfahan suffer from one of the types of headaches among which migraine and tension headaches had a high prevalence. Enhancing the awareness and knowledge of the students and teachers through holding educational programs about how to treat and prevent headache attacks is recommended.

Keywords: Headache, Migraine, Tension headache, Child, Adolescent, Student, Iran

ETIOLOGY

- Childhood headaches are rarely caused by a serious underlying disorder. infections are the most common cause of secondary headache in children

CLASSIFICATION

- Headaches can be classified as primary (those intrinsic to the nervous system and secondary. Secondary headaches develop in close temporal relationship to the underlying condition

Primary Headache Disorders

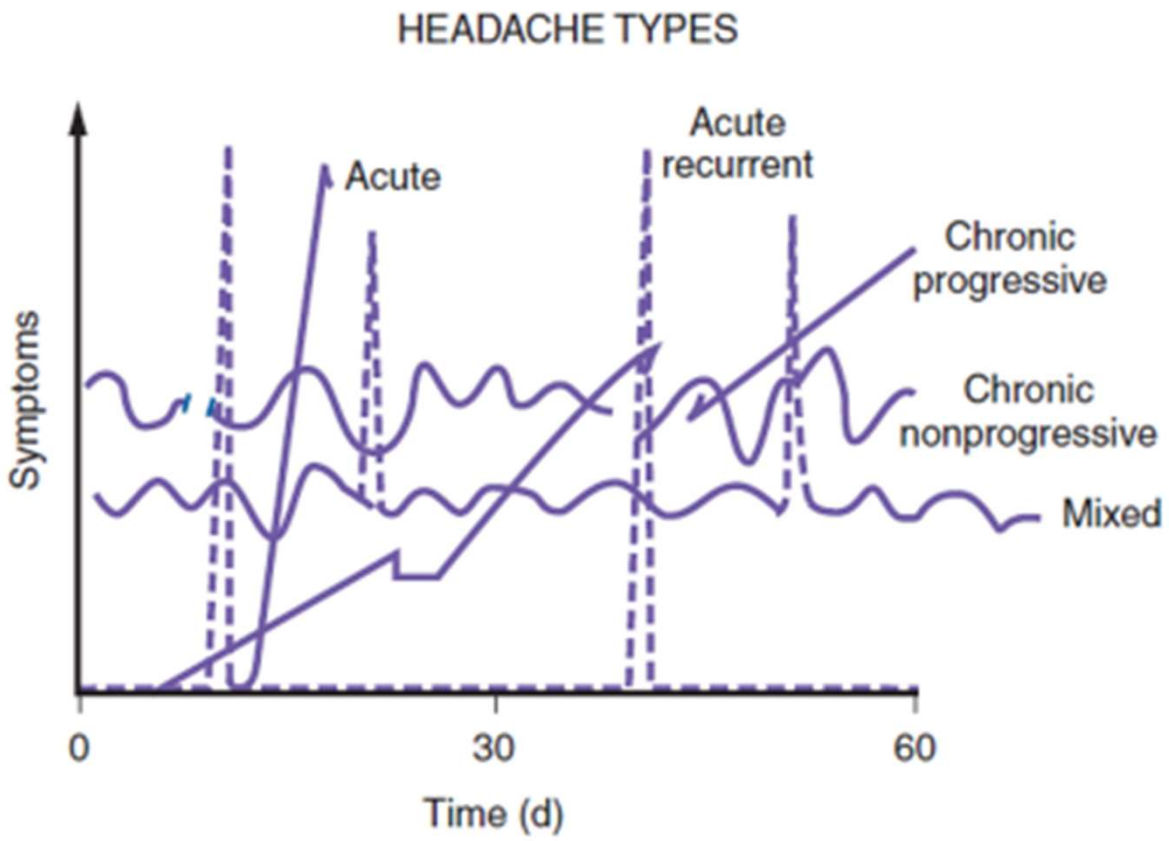
1. Migraine
2. Tension-type
3. Cluster headache
4. Other primary headache disorders

Secondary Headaches

5. Headache attributed to head or neck trauma
6. Headache attributed to cranial or cervical vascular disorder
7. Headache attributed to nonvascular intracranial disorder
8. Headache attributed to substance or withdrawal from substances
9. Headache attributed to infection
10. Headache attributed to disorders of homeostasis
11. Headache attributed to disorders of the cranium, neck, eyes, ears, nose, sinuses, teeth, or other facial or cranial structures
12. Headache attributed to psychiatric disorders

Cranial Neuralgias, Central and Primary Facial Pain

13. Cranial neuralgia and central causes of facial pain
14. Other headache, cranial neuralgia, central or primary facial pain


HEADACHE TYPES
Acute
Acute recurrent
Chronic progressive
Chronic nonprogressive
Mixed
Symptoms
0
30
60
Time (d)

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Diagnostic criteria for migraine

Migraine without aura
A. At least five attacks fulfilling criteria B through D
B. Headache attacks lasting 4 to 72 hours (untreated or unsuccessfully treated)
C. Headache has at least two of the following characteristics:
Unilateral location
Pulsating quality
Moderate or severe pain intensity
Aggravation by or causing avoidance of routine physical activity (eg, walking or climbing stairs)
D. During headache at least one of the following:
Nausea, vomiting, or both
Photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis

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Migraine with aura
A. At least two attacks fulfilling criterion B and C
B. One or more of the following fully reversible aura symptoms:
Visual
Sensory
Speech and/or language
Motor
Brainstem
Retinal
C. At least three of the following six characteristics:
At least one aura symptom spreads gradually over ≥5 minutes
Two or more symptoms occur in succession
Each individual aura symptom lasts 5 to 60 minutes
At least one aura symptom is unilateral
At least one aura symptom is positive
The aura is accompanied or followed within 60 minutes by headache
D. Not better accounted for by another ICHD-3 diagnosis

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Episodic tension-type headache diagnostic criteria

Description: Episodes of headache, typically bilateral, pressing or tightening in quality and of mild to moderate intensity, lasting minutes to days. The pain does not worsen with routine physical activity and is not associated with nausea, but photophobia or phonophobia may be present. Increased pericranial tenderness may be present on manual palpation.
A. At least 10 episodes of headache fulfilling criteria B through D. Infrequent and frequent episodic subforms of TTH are distinguished as follows:
Infrequent episodic TTH: Headache occurring on <1 day per month on average (<12 days per year).
Frequent episodic TTH: Headache occurring on 1 to 14 days per month on average for >3 months (≥12 and <180 days per year).
B. Headache lasting from 30 minutes to seven days.
C. At least two of the following four characteristics:
Bilateral location.
Pressing or tightening (nonpulsating) quality.
Mild or moderate intensity.
Not aggravated by routine physical activity such as walking or climbing stairs.
D. Both of the following:
No nausea or vomiting.
No more than one of photophobia or phonophobia.
E. Not better accounted for by another ICHD-3 diagnosis.

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Diagnostic criteria for cluster headache

Cluster headache: Diagnostic criteria for cluster headache require the following:
A. At least five attacks fulfilling criteria B through D
B. Severe or very severe unilateral orbital, supraorbital, and/or temporal pain lasting 15 to 180 minutes when untreated; during part (but less than half) of the active time course of cluster headache, attacks may be less severe and/or of shorter or longer duration
C. Either or both of the following:
1. At least one of the following symptoms or signs ipsilateral to the headache:
a) Conjunctival injection and/or lacrimation
b) Nasal congestion and/or rhinorrhea
c) Eyelid edema
d) Forehead and facial sweating
e) 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; during part (but less than half) of the active time-course of cluster headache, attacks may be less frequent
E. Not better accounted for by another ICHD-3 diagnosis
Episodic cluster headache: Diagnostic criteria for episodic cluster headache require the following:
A. Attacks fulfilling criteria for cluster headache and occurring in bouts (cluster periods)
B. At least two cluster periods lasting from seven days to one year (when untreated) and separated by pain-free remission periods of three months or more
Chronic cluster headache: Diagnostic criteria for chronic cluster headache require the following:
A. Attacks fulfilling criteria for cluster headache
B. Attacks occurring without a remission period, or with remissions lasting less than three months, for at least one year

Features of migraine in children and adolescents

Attacks may last 2 to 72 hours*

Headache is more often bilateral than in adults; an adult pattern of unilateral pain usually emerges in late adolescence or early adulthood

Photophobia and phonophobia may be inferred by behavior in young children

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۱-Age at onset
۲-Mode of onset
۳-What is the headache pattern: acute, acute recurrent, chronic progressive, nonprogressive daily, or mixed?
۴-How often does the headache occur?
۵-How long does the headache last?
۶-Is there an aura or prodrome?
۷-When do the headaches occur?
۸-What is the headache quality (throbbing/pulsating, dull aching, squeezing, etc)?

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۹-Where is the pain?
۱۰-What brings the headache on or makes it worse?
۱۱-What makes the headache go away?
۱۲- Are there associated symptoms?
۱۳- Do symptoms continue between headaches?
۱۴- Do the headaches impair normal functioning and quality of life?

Additional information

۱-Past medical history
۲-Medications and vitamins
۳-Recent change in weight or vision
۴-Recent changes in sleep, exercise, or diet
۵-Change in school or home environment
۶-Family history of headache or neurologic disorder
۷-Mental health history/symptoms, psychosocial stressors

Physical Examination

Examination feature	Possible significance
General appearance	Altered mental status may indicate meningitis, encephalitis, intracranial hemorrhage, elevated intracranial pressure, hypertensive encephalopathy.
Vital signs	▪ Hypertension may cause headache or be a response to increased intracranial pressure ▪ Fever suggests infection (most commonly upper respiratory infection) but may occur with intracranial hemorrhage or central nervous system malignancy
Head circumference	Macrocephaly may indicate slowly progressive increases in intracranial pressure.
Height and weight trajectories	Abnormal or altered trajectories may indicate intracranial pathology.
Auscultation of the neck, eyes, and head for bruit	Bruit may indicate arteriovenous malformation.
Palpation of the head and neck	▪ Localized scalp tenderness may occur in migraine and tension-type headaches ▪ Scalp swelling may indicate head trauma ▪ Sinus tenderness may indicate sinusitis ▪ Temporomandibular joint (TMJ) and/or masseter tenderness suggests TMJ dysfunction ▪ Nuchal rigidity may indicate meningitis ▪ Posterior neck pain may indicate an anatomic abnormality (eg, Chiari malformation) ▪ Thyromegaly may indicate thyroid dysfunction
Visual fields	Visual field abnormalities may indicate increased intracranial pressure and/or a space-occupying lesion.
Funduscopy	▪ Papilledema may indicate increased intracranial pressure ▪ Funduscopic examination is normal in primary headache
Otoscopy	May demonstrate otitis media; hemotympanum may indicate trauma.
Oropharynx	Signs of pharyngitis? Dental decay or abscess?
Neurologic examination (see text for details)	Abnormal neurologic examination (particularly mental status, eye movements, papilledema, asymmetry, coordination disturbance, abnormal deep tendon reflexes) may indicate intracranial pathology but also may occur with migraine headache.
Skin examination	Signs of neurocutaneous disorders (eg, neurofibromatosis, tuberous sclerosis complex, which are associated with intracranial neoplasms) or trauma (bruises, abrasions, etc).
Spine	Signs of occult spinal dysraphism (eg, midline vascular of pigment changes), which may be associated with structural abnormalities (eg, Chiari malformation).

Alarm sign

Patient history
Inadequate history (description of headache and relative features)
Risk factor for intracranial pathology (eg, sickle cell disease, immune deficiency, malignancy or history of malignancy, coagulopathy, cardiac disease with right-to-left intracardiac shunt, head trauma, neurofibromatosis type 1, tuberous sclerosis complex, pre-existing hydrocephalus or shunt)
Age <6 years
Personality change
Deterioration of school work
Associated symptoms in the neck or back
Family history
Absence of family history of migraine
Examination findings
Child uncooperative (unable to complete neurologic examination)
Abnormal neurologic examination (eg, ataxia, weakness, diplopia, abnormal eye movements, other focal signs)
Papilledema or retinal hemorrhages
Growth abnormalities (increased head circumference, short stature or deceleration of linear growth, abnormal pubertal progression, obesity)
Nuchal rigidity
Signs of trauma
Cranial bruits
Skin lesions that suggest a neurocutaneous syndrome (neurofibromatosis, tuberosis sclerosis complex)

Abdominal migraine

- Abdominal migraine is characterized by recurrent episodes of abdominal pain in an otherwise healthy child who is normal between attack. The pain is typically midline or poorly localized, dull and moderate to severe in intensity

Benign paroxysmal vertigo

- Benign paroxysmal vertigo of childhood is characterized by brief recurrent attacks of vertigo in otherwise healthy children. The disorder often presents when the child is a toddler, although may be manifest later in childhood.

Cyclic vomiting syndrome

- is an idiopathic disorder characterized by repeated and usually stereotypical episodes of nausea and vomiting that last for hours to days, separated by symptom-free periods of variable length

Benign paroxysmal torticollis

- Benign paroxysmal torticollis of infancy is characterized by periods of an abnormal, sustained posture of the head and neck in which the head tilts to either side, with or without slight rotation.

Management of migraine

- Non-pharmacologic methods (life style biofeedback, relaxation,exercise)
- Pharmacologic therapy for acute attack
- Preventive therapy

APPROACH TO TREATMENT

- Educating the child and family about migraine headache is an important aspect of care. A headache calendar may identify triggering factors, clarify features of the attacks, and help evaluate the effectiveness of treatment

- The US Food and Drug Administration (FDA) has approved the use of rizatriptan for children ۶ to ۱۷ years of age. For children ۱۲ years of age and older, FDA-approved triptans are almotriptan, zolmitriptan nasal spray, and the combination of sumatriptan and naproxen

- When migraine symptoms develop, the child should rest or sleep in a dark, quiet room with a cool cloth applied to the forehead.
- Medications useful for the acute treatment of migraine range from analgesics such as nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen to triptans, antiemetics, and the less commonly used dihydroergotamine

ANALGESICS	
Ibuprofen	7–10 mg/kg/ every 4–6 hours
Acetaminophen	15 mg/kg/ every 4–6 hours
Naproxen sodium	10–15 mg/kg every 8–12 hours
Ketorolac	10–30 mg IV, PO
TRIPTANS	
Nasal Sprays	
Sumatriptan	5–20 mg
Zolmitriptan	5–10 mg
Oral Forms	
Almotriptan*	6.25, 12.5 mg
Eletriptan	20, 40 mg
Frovatriptan	2.5 mg
Naratriptan	1, 2.5 mg
Sumatriptan	25, 50, 100 mg
Rizatriptan	5, 10 mg (tablet and ODT)
Zolmitriptan	5, 10 mg (tablet and ODT)
Injectable (Subcutaneous)	
Sumatriptan	6 mg

DRUG	DOSE	MECHANISM	SIDE EFFECTS	COMMENTS
PROPHYLAXIS (NONE APPROVED BY FDA FOR CHILDREN)				
Calcium Channel Blockers				
Flunarizine†	5 mg hs	Calcium channel blocking agent	Headache, lethargy, dizziness	May ↑ to 10 mg hs
Anticonvulsants				
Valproic acid	20 mg/kg/24 hr (begin 5 mg/kg/24 hr)	↑ Brain GABA	Nausea, pancreatitis, fatal hepatotoxicity	↑ 5 mg/kg every 2 wk
Topiramate	100-200 mg divided bid	↑ Activity of GABA	Fatigue, nervousness	Increase slowly over 12-16 wk
Levetiracetam	20-60 mg/kg divided bid	Unknown	Irritability, fatigue	Increase every 2 wk starting at 20 mg/kg divided bid
Gabapentin	900-1800 mg divided bid	Unknown	Somnolence, fatigue aggression, weight gain	Begin 300 mg, ↑ 300 mg/wk
Antidepressants				
Amitriptyline	1 mg/kg/day	↑ CNS serotonin and norepinephrine	Cardiac conduction, abnormalities and dry mouth, constipation, drowsiness, confusion	Increase by 0.25 mg/kg every 2 wk Morning sleepiness reduced by administration at dinnertime
Antihistamines				
Cyproheptadine	0.2-0.4 mg/kg divided bid; max 0.5 mg/kg/24 hr	H_1-receptor and serotonin agonist	Drowsiness, thick bronchial secretions	Preferred in children who cannot swallow pills; not well tolerated in adolescents
Antihypertensive				
Propranolol	10-20 mg tid	Nonselective β-adrenergic blocking agent	Dizziness, lethargy	Begin 10 mg/24 hr ↑ 10 mg/wk (contraindicated in asthma and depression)
Others				
Coenzyme Q10	1-3 mg/kg/day	Increases fatty acid oxidation in mitochondria	No adverse effects reported	Fat soluble; ensure brand contains small amount of vitamin E to help absorption
Riboflavin	50-400 mg daily	Cofactor in energy metabolism	Bright yellow urine, polyuria and diarrhea	
Magnesium	9 mg/kg divided tid	Cofactor in energy metabolism	Diarrhea or soft stool	
Butterbur	50-150 mg daily	May act similar to a calcium channel blocker	Burping	
OnabotulinumtoxinA	100 units (age 11-17 yr)	Inhibits acetylcholine release from nerve endings	Ptosis, blurred vision, hematoma at injection site	Used off label in children
SEVERE INTRACTABLE				

The Efficacy of Topiramate in Benign Paroxysmal Torticollis of Infancy: Report of Four Cases

Omid Yaghini, MD,[a] Negin Badihian,[a] Shervin Badihian, MD[a,b]

abstract

Benign paroxysmal torticollis (BPT) is a rare paroxysmal dyskinesia and 1 of the childhood periodic syndromes presenting with recurrent stereotypic episodes of torticollis, usually accompanied with some of the nonheadache features of migraine such as vomiting and ataxia. Although the nature of BPT may seem benign, its recurrent episodes can mimic attacks of epilepsy and expose the infant to unnecessary hospitalization and adverse effects of inappropriate medications. There is no approved medication for the disease, but a few studies have suggested that cyproheptadine is useful. However, use of this agent has not been confirmed as effective for these patients, and the safe dosage for children aged <2 years has not yet been established. We report 4 patients who exhibited a successful response to treatment with topiramate (their episodes of BPT stopped). Considering the underlying relation of BPT with migraine, the satisfactory response of our patients to topiramate, and the safety of this medication in neonates and children, topiramate seems to be an effective and safe medication for the reduction and elimination of BPT episodes. In addition, 1 of our case subjects (patient 4) confirmed this finding by exhibiting an explicit dependence in the regularity and duration of her attacks with topiramate. Topiramate seems to be an effective medication for the prophylaxis of BPT episodes. Further studies and clinical trials are recommended.

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Dr Yaghini conceived the main idea of the study, provided patient information, conducted patient follow-up, and revised and approved the final manuscript as submitted; and Ms Badihian and Dr Badihian prepared the final manuscript, contributed to gathering of patient data, and approved the final manuscript as submitted.

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Prophylactic Therapy of Cyclic Vomiting Syndrome in Children: Comparison of Amitriptyline and Cyproheptadine: A Randomized Clinical Trial

Negin Badihian[1], Hossein Saneian, MD[2], Shervin Badihian, MD[2,3] and Omid Yaghini, MD[2]

OBJECTIVES: **Cyclic vomiting syndrome (CVS) is a common functional gastrointestinal disorder characterized by recurrent episodes of nausea and vomiting. There is no definite treatment for the condition, although some medications are recommended. We aimed to compare the efficacy of amitriptyline and cyproheptadine in prophylactic therapy of CVS.**

METHODS: **This is a single-blinded randomized clinical trial conducted during 2015–2016 in Isfahan, Iran. Sixty-four children who were 3–15 years old, with a diagnosis of CVS (based on Rome III criteria), were included in the study and were randomly divided into two groups of amitriptyline and cyproheptadine. They were followed for 6 months, looking for frequency and duration of attacks as the primary outcome.**

RESULTS: **The mean monthly frequency of attacks in the last 2 months of the study in the amitriptyline and cyproheptadine group were 0.38±0.55 and 0.59±0.71, respectively (*P*-value=0.197), after intervention. The mean duration of attacks between amitriptyline and cyproheptadine group were 1.41±2.86 and 1.81±2.22 h, respectively (*P*-value=0.212). In the amitriptyline group 65.6% of patients reported 100% remission, whereas in the cyproheptadine group 50% reported full remission (*P*-value=0.206).**

CONCLUSIONS: **There was no superiority of one of the medications over the other. We did not find any age-related effect on the efficacy of these medications as well.**

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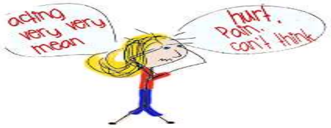
Pediatric Migraine



Diagnostic "Pearls"

- For kids, drawing may be easier than talking about migraine
- This approach tends to produce very accurate diagnoses
- An MRI may be needed in children:
  - o Younger than age 6
  - o With occipital headaches
  - o With headaches that wake up a child from sleep
  - o With new onset headache or abnormal neurological examination

A Common Problem

- Headache affects:
  - o 37% to 51% of 7-year-olds

  - o 57% to 82% of 15-year-olds

- Recurrent migraine affects:
  - o ~2.5% to 4.0% of children under age 8
  - o ~10% of 5- to 15-year-olds
- Boys are far more likely to have migraine than girls at a very young age
- By the preteen and teen years, prevalence in girls sharply surpasses boys
- Migraine prevalence increases to adult levels throughout the late-teen years

Different in Children and Adolescents

- Children and adolescents are not mini-adults
- Migraine symptoms and presentation differ from adults:
  - o Attacks can last 1 or 2 hours, not 4
  - o Pain often affects both sides of the head
- Treatments may not work the same way

Understanding Disability

- Migraine can prevent or limit school and other social activities significantly more than those who don't have migraine
- A tool called PedMIDAS* - which stands for PEDiatric Migraine DisAbility Score - can be used to assess migraine disability in younger patients

In the last three months, how many...

1. Full days of school were missed due to headaches?
2. Partial days of school were missed due to headaches?
3. Days did you function at less than half your ability in school because of a headache?
4. Days were you not able to do things at home (e.g., chores, homework, etc.)
5. Days you did not participate in other activities due to headache (e.g., play, go out, sports, etc.)
6. Days did you participate in these activities, but functioned at less than half your abilities?

Add them up!

- The number of days are added to determine migraine-related disability
  - o Below 10 means little to none
  - o 11-30 means mild
  - o 31-50 means moderate
  - o Above 50 means severe

*PEDiatric Migraine DisAbility Score

Goals of Treatment

1. Reduce headache frequency, severity, duration, and disability
2. Reduce reliance on poorly tolerated, ineffective, or unwanted acute medications
3. Improve quality of life
4. Avoid acute headache medication escalation
5. Educate and enable patients to self-manage their condition
6. Reduce headache-related distress and psychological symptoms

Balanced Treatment Plans

- To achieve treatment goals, balanced treatment plans are needed
- Balanced plans include medical, biobehavioral, and nonpharmacologic treatments
  - o Medical — acute and preventive medications
  - o Biobehavioral — biofeedback, cognitive behavioral therapy, stress management, sleep hygiene, exercise, and dietary modifications
  - o Nutraceuticals — vitamin B2, coenzyme Q10 and vitamin D

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کسی که برای دنیا به دین عمل کند
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