Migraine in Children

Migraine is a recurrent headache that occurs with or without aura and lasts in children from 30 minutes to 48 hours. It is the most common cause of primary headache in children. It differs from migraine in adults and is likely to be under-diagnosed.

Although there are many features in common with adult migraine (see separate articles on Migraine, Migraine Management and Migraine Prophylaxis in Adults), this article highlights aspects important in childhood migraine.

Epidemiology

Migraine is the most important cause of headache leading to a decrease in the quality of life in children and adolescents.\(^1\) It is more common in boys than in girls until after the menarche, when it becomes more common in girls. Chronic migraine affects 0.8-1.8% of adolescents and 0.6% of children.\(^2\)

Classification of migraine

Childhood migraine may present in a similar way to migraine in adults but non-headache and neurological symptoms (aura) may be more prominent than the headache. No formal classification of headaches specific to children exists. The International Classification of Headache Disorders (ICHD) from the International Headache Society (IHS) defines migraine and recognises the childhood variants in its classification:\(^3\)

IHS Classification

Including variants (some rare) seen in childhood:

- **Migraine without aura** - the most common variety in children and adults.
- **Migraine with aura** - 14-30% of migraine in children and including:
  - **Aura without headache** - more common in childhood.
  - **Hemiplegic migraine** - more common in childhood.
  - **Basilar migraine** - more common in childhood, particularly in young girls.
  - **Ophthalmoplegic migraine** - very rare but more common in children than in infants, and even rarer in adults.
  - **Acute confusional migraine** - seen in childhood.

- **Childhood periodic syndromes** - commonly precursors of migraine and include:
  - **Cyclical vomiting**.
  - **Abdominal migraine**.
  - **Benign paroxysmal vertigo of childhood**.

- **Retinal migraine** - seen more in children and in young adults.
- **Probable migraine**.
- **Complications of migraine**.

Presentation and diagnosis:\(^3\)

- The diagnosis in children is often more difficult than for adults and any difficulty with diagnosis can exacerbate parental anxiety.
- Migraine headache in children and adolescents (aged under 18 years) is more often bilateral than is the case in adults. Unilateral pain usually emerges in late adolescence or early adult life.
- Migraine headache is usually frontotemporal. Occipital headache in children is rare and the possibility of a different diagnosis should therefore be carefully considered.
Modified IHS criteria (note shortened duration from adult 4-72 hours)

<table>
<thead>
<tr>
<th>IHS criteria for the diagnosis of migraine without aura under 15 years</th>
<th>IHS criteria for the diagnosis of migraine with aura under 15 years</th>
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<td><strong>Five attacks</strong> of headache lasting 2-72 hours. Headaches meet at least two of these criteria:</td>
<td><strong>Two attacks with at least three</strong> of the following:</td>
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<td>● Unilateral OR bilateral.</td>
<td>● One or more fully reversible aura symptoms including focal cortical, brainstem dysfunction or both.</td>
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<td>● Throbbing in character.</td>
<td>● At least one aura symptom that develops gradually over more than four minutes or two or more that occur in succession.</td>
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<td>● Moderate-to-severe intensity, ie inhibit or prohibit daily activity.</td>
<td>● No aura symptoms lasting &gt;60 minutes.</td>
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<td>● Aggravated by routine physical activity.</td>
<td>● Headache follows aura within 60 minutes.</td>
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**At least one** of the following symptoms present with the headache:
- Nausea, vomiting or both.
- Photophobia, phonophobia or both.

Clinical scenarios

- Preschool children with migraine may look ill, with abdominal pain and vomiting relieved by sleep.
- Preschool children may exhibit pain with changes in behaviour (irritability, crying, seeking out a darkened room).
- Those aged 5 to 10 years often have bilateral pain with abdominal cramps and vomiting. They usually sleep within an hour of onset.
- Location and intensity of headache may alter within and between attacks.
- Intensity and duration of headache increase with age and become more usually unilateral.
- A family history is common in migraine patients.

Migraine without aura

Most migraine in children is of this type. It is worth reviewing with parents the typical phases of an attack, so that changes in behaviour and mood can be put into context:

- Premonitory symptoms (changes in mood, appetite, thirst, arousal, etc).
- Headache lasting 30 minutes to 48 hours in children. This may be the only phase of which the patient is aware. In children the pain may be bilateral and is not always throbbing or pulsating in nature.
- Accompanying symptoms occur and are prominent in children - such as, sensitivity to light (photophobia), sounds (phonophobia) and smells, gastrointestinal disturbance, tiredness, etc.
- Postdromes (fatigue, depression).

Migraine with aura

The aura may follow premonitory symptoms and may or may not be followed by headache.

- The aura may suggest cortical dysfunction (visual, sensory, motor, speech or language disturbance, cognitive impairment including confusion), or brainstem dysfunction (loss of consciousness, vertigo, ophthalmoparesis).
- Children may find it difficult to describe the aura.
- The aura is often more distressing than the headache in children.
- Visual auras are the most common (blurred vision, fortification spectra, scotomata, micropsia, macropsia, dysmorphopsia, etc).
- Children who eventually develop migraine with aura usually present earlier than children experiencing migraine without aura.

Some of the less common **migraine variants** are listed to illustrate diagnostic difficulty and, invariably, they require specialist referral.
Aura without headache
- Visual auras are the most frequent.
- Consider other diagnoses, especially if never followed by headache.

Hemiplegic migraine
- A dramatic presentation.
- Hemiplegia or hemiparesis may precede or accompany the less dramatic headache.
- There is usually a family history.

Basilar migraine
- Aura followed by dizziness, syncope and minimal headache.
- Most often seen in adolescent girls.

Ophthalmoplegic migraine
- Disorders of eye movement or pupillary response precede the headache.

Acute confusional migraine
- Migraine before or following transient episodes of amnesia, confusion and expressive aphasia or dysphasia following minor head trauma.

Childhood periodic syndromes
Periodic disorders of childhood often represent precursors of migraine. There is often a positive family history of migraine in children that present with periodic syndromes.[4] Childhood can present a diagnostic challenge and need specialist referral. They include:

- Cyclical vomiting with migraine (periodic syndrome). This is characterised by recurrent episodes of intense vomiting occurring often at night and with complete recovery in between attacks. Girls are more affected. Stress and dietary triggers may be identified. It typically begins in toddlers.
- Abdominal migraine. This presents typically as recurrent bouts of generalised abdominal pain associated with nausea and vomiting but no headache, followed by sleep and recovery. Typical migraines may occur separately.
- Benign paroxysmal vertigo. This is seen usually from age 2-6 years and is characterised by brief episodes of vertigo and nausea with no hearing loss or loss of consciousness. More common migraine eventually ensues but referral to exclude posterior fossa tumours is required.

Differential diagnosis
As can be appreciated from the wide variation in presentation of migraine and migraine variants, there is in theory a long and varied list. However, other possible diagnoses can be grouped under the following:

- Headache - other primary and secondary headache.
- Aura - other causes of the neurological disturbance.
- Non-headache symptoms - other causes of, for example, nausea and vomiting.

Investigations
These may follow history and examination (including fundoscopy and head circumference).[5] Further investigation is not usually required but is indicated, for example, if:

- Neurological examination is abnormal (persistent focal signs or papilloedema).
- There is a history of seizures.
- There is a history of head trauma.
- There has been a significant unexplained change in the pattern of headaches.
Associated diseases

Asthma, allergies, motion sickness and seizure disorders are all more common in migraine patients.

Management

The principles are similar to those in adult migraine management. Important differences can be highlighted:[5]

- Conservative management alone is more often effective.
- Reassurance of parents is an important part of management.
- Drug dosages and contra-indications are different.
- Children with migraine not responding to trigger avoidance and simple analgesics with or without anti-emetics should be referred to a paediatrician with an interest in headache.
- Management in children involves the whole family.

General measures

- **Explanation and reassurance.** This should emphasise what migraine is and how realistically attacks can be reduced. Fears about brain tumours and more serious conditions should be discussed and fears allayed.
- **Identification of triggers and predisposing factors,** often with a trigger/headache diary. This may be important in the development of a behavioural strategy. Dietary sensitivities affect only about 20% of migraine sufferers. In children, the following triggers have been identified as important: sleep, stress, dehydration/warm weather, missed meals, video games.[6]
- **Behavioural management strategy.** This should emphasise routine around sleeping, eating and avoiding an overloaded routine to help prevent migraine, as well as strategies for dealing with an attack (lie in a cool, dark, quiet room and encourage sleep with pharmacological or non-pharmacological support).

Drug intervention for acute attacks[7]

- This should be according to the success of previous treatments and severity of attack.
- Simple analgesics such as paracetamol and ibuprofen are recommended as first-line early in the attack. Ibuprofen is likely to be more effective. Despite guideline consensus, there is little evidence for their efficacy.
- Anti-emetics are recommended. Domperidone is licensed in children of all ages, and prochlorperazine is licensed in children older than 12 years of age. Domperidone can also be used, in the absence of nausea and vomiting, to promote gastric motility.
- If simple analgesics are ineffective, the 5HT1-receptor agonists (triptans) sumatriptan or zolmitriptan can be used. Triptans for children should only be initiated by a specialist.
- Sumatriptan can be given orally for those aged 6 years and older, by subcutaneous injection for those aged 10 years and older, and intranasally for those aged 12 years and older.
- Zolmitriptan can be given orally or intranasally to those aged 12 years and older.
- Ergot alkaloids should be avoided.

Drug intervention for prophylaxis

- This should be considered when the frequency and severity of attacks causes interference with school attendance or social life.[5]
- It should be used with acute therapy and not instead of it.
- There is little evidence for efficacy of the available drugs in children. Propranolol, topiramate or pizotifen can be used. The evidence for efficacy of pizotifen is not clear and common side-effects include drowsiness and weight gain.[7]

Referral guidance

There may be parental pressure to refer early. This can be for many reasons but typical examples include:

- Anxiety about the diagnosis.
- Severity of symptoms.
- Lack of treatment efficacy.
These overlap with guidance which suggests a rationale for onward referral. Explaining the rationale when referring may help the GP to take over again with ongoing management and maintain patient and parental confidence with GP management.

**Consider either admission or urgent referral:**

- If a serious cause of headache is suspected. This may be so if there are abnormal examination findings.
- When the migraine is severe, particularly if it has lasted for longer than 72 hours (status migrainosus).

**Consider paediatric referral when:**

- Complications of migraine develop (such as chronic migraine).
- The diagnosis is uncertain and another cause of headache is suspected (primary or secondary headache disorders).
- Treatment is not working. Occasionally this might be because of overuse of medication.
- Preventative treatment is needed and expertise in such treatment is required.

**Prognosis**

Generally, migraine improves with age and often abates temporarily around adolescence. However, about half of children and adolescents with migraine headaches will continue to have migraines into adulthood.

**Further reading & references**

5. Diagnosis and Management of Migraine, Tension-Type, Cluster and Medication-Overuse Headache; British Association for the Study of Headache (BASH) Guidelines, (2010 - reviewed 2014)
7. British National Formulary
9. Migraine; NICE CKS, August 2013 (UK access only)

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