Headache in Childhood and Adolescence

The aim of this review article is to equip you with a paediatric perspective of headache: the commonalities and differences between that seen in childhood and adulthood in terms of presentation, diagnosis and management. Headache is extremely common in childhood and adolescence. By the age of seven, half of all children will have experienced a headache of one sort or another. Almost all young people will have by the age of 15. The burden of paediatric headache is huge. A recent study showed that 0-20% of young adolescents suffered from headache which reduced their ability to function for more than 12 days in a three month period and which was associated with reduction in quality of life greater than that of teenagers with diabetes or asthma.1 Despite this, most young chronic headache sufferers never get to see a headache specialist.1

History (Figure 1)

Most children and adolescents will attend a consultation with their parents. Involve even the very young patient in the information-gathering part of the visit; a child as young as five can give you a history of pulsating headache aggravated by movement. Parents can provide a perspective on their child’s personality, ambitions and worries, all of which can influence the prevalence and experience of headache.2

Examination

In the first article in this series on paediatric neurology Anna Maw discussed the approach to paediatric neurology examination. A detailed neurological assessment by confrontation can be successfully performed in most school-age children, can avoid the need for brain imaging when normal and offer reassurance for patients and parents3. Include:

- Assessment of growth (plot on UK standard growth chart, to include head circumference in a child <4 years).
- Evaluation for meningism, irritability and conscious level.
- Blood pressure measurement.
- Auscultation of scalp and eyes for bruits
- Inspection of mouth for bruxism.
- Bimanual palpation of jaw whilst patient opens and closes mouth.
- Inspection of skin for neurocutaneous syndromes.

Even in the presence of normal neurology however the presence of ‘red flags’ should alert you to consider brain imaging or other investigations. Red flags include acute onset of severe headache, headache at night or on waking from sleep with vomiting, or progressive headache with behaviour change and / or academic failure.

Secondary headache in childhood and adolescence

The vast majority of secondary headache in childhood and adolescence is associated with other symptoms or examination findings of neurological deficit. Figure 2 highlights some pointers to secondary headaches encountered more commonly in early life.
Acute severe headache
- Infection eg meningitis – the younger the patient the less specific signs of meningitis are for meningitis.
- Venous thrombosis – headache quality is variable in quality and site with no relationship between site of headache and location of the thrombus save in sigmoid sinus thrombosis. Consider in childhood especially where otitis media / mastoiditis / dehydration are present, or in the presence of hypercoagulable states such as inflammatory bowel disease and nephrotic syndrome. Cranial neuropathies including hemianopia, deafness, oculomotor and abducens palsies are common, with acute raised intracranial pressure signs in lateral sinus thrombosis.
- Intracranial haemorrhage – more likely due to bleed into tumour or venous infarct, or from AVM rather than from a berry aneurysm.

Acute recurrent headache
- Idiopathic or symptomatic occipital epilepsy – post-ictal headache (2/3 of patients) may be indistinguishable from migraine. Unlike migraine, seizures may occur several times a day. A careful history of visual phenomena and accompanying headache will be discriminating. With or without blindness, visual hallucinations of occipital seizures usually last 1-3 minutes, are non-progressive, multi-coloured and circular vs the linear, zigzag and dichromatic features of migraine aura. May involve other non-occipital ictal phenomena eg those arising from involvement of temporal lobe.
- Chiari malformation-related headache – symptoms attributable to brain protrusion through the foramen magnum include headache, ataxia, vertigo, hearing loss, neck pain and dysarthria aggravated by coughing and Valsalva manoeuvre. Surgical decompression is required for truly symptomatic cases.

Chronic progressive headache
- Brain tumour (98% accompanied by other neurology eg eye movement disorder, ataxia).
- VP shunt blockage / failure – acute or chronic headache, drowsiness and vomiting at onset with overlap with common paediatric diagnoses, but a combination of all three in a child with a shunt makes blockage highly likely. An unchanged CT scan does not rule out shunt blockage.
- Idiopathic intracranial hypertension – post-pubertal IIIH is similar to ‘adult’ IIIH with female sex and obesity predominating. In prepubertal children obesity is uncommon; strabismus and a stiff neck may accompany or occur without headache. Opening CSF pressure of >18cmH2O (age<8y with papilloedema) and >25cmH2O (age>8 or less than 8 without papilloedema) should suggest IIIH in prepubertal children.

Primary headache in childhood and adolescence

Migraine
The most prevalent primary headache in childhood and adolescence, prior to puberty migraine shows early male predominance with 3:1 male prevalence. Migraine is more common after puberty (up to a quarter of adolescents) and girls catch up with boys in terms of prevalence. Migraine has been reported in toddlers, behaviour change and vomiting being the predominant symptoms at this age. Spontaneous remission does occur in a large minority of adolescents, with a much reduced chance if migraine is still occurring after 18 years of age. Catamenial migraine is rare in the paediatric population.

IHS criteria for paediatric migraine are different to adult migraine (Figure 3) but the 2-72 hour duration limit is thought to be restrictive as some childhood migraine attacks are very short indeed. Childhood migraine is more likely to be bilateral (bitemporal / bifrontal) compared to adult migraine. Aura occurs in 15%, most commonly visual. Vagal phenomena are often prominent.

Acute confusional migraine is uncommon, with confusion and dysarthria dominating attacks encountered after minor head injury or exercise. This migraine variant, associated with focal slowing on EEG and hypoperfusion on SPECT imaging, can cause considerable diagnostic difficulty at first presentation.

The paediatric migraineur may have a history of one or more ‘childhood periodic syndromes’ thought to be migraine variants although there is no clear predictive relationship between many of these and later migraine headache.
- Benign paroxysmal torticollis of infancy (regular attacks of acute agitation, vomiting, pallor and torticollis lasting a few minutes in a toddler).³
- Benign paroxysmal vertigo (acute vertigo, nystagmus lasting a few minutes, usually in a preadolescent child). The commonest cause of recurrent childhood vertigo other than recurrent otitis media. The latter is easy to spot by identifying conductive hearing loss and visualising the inflamed eardrum.
- Cyclical vomiting syndrome (incapacitating recurrent vomiting lasting several days randomised, placebo-controlled trials show that ibuprofen, nasal sumatriptan / zolmitriptan, but in only one study each.¹ Pizotifen, amitriptyline, clonidine, nimodipine, anticonvulsants and anti-emetics have not been shown to work although most studies examining these drugs concern small numbers of patients.

Prevention and treatment of paediatric migraine
Composite data from a small number of randomised, placebo-controlled trials show that ibuprofen, nasal sumatriptan / zolmitriptan and oral rizatRIPTAN are effective migraine attack treatments.¹³ Preventative therapy has a very poor evidence base in childhood migraine and high quality intervention studies are badly needed. Propranolol and flunarizine have been shown to be effective prophylactic agents, but in only one study each. Pizotifen, amitriptyline, clonidine, nimodipine, anticonvulsants and anti-emetics have not been shown to work although most studies examining these drugs concern small numbers of patients.

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<th>Figure 2: Important considerations when screening for secondary headaches in childhood / adolescence</th>
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<th>Figure 3: IHS criteria for childhood migraine without aura</th>
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<td><strong>Five or more headaches lasting 1-72 hours with at least two of the following characteristics</strong></td>
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<td>• Unilateral or bilateral pain</td>
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<td>• Throbbing pain</td>
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<tr>
<td>• Moderate or severe pain</td>
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<td>• Pain aggravated by routine physical activity</td>
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<td>and at least one of the following</td>
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<td>• Nausea / vomiting</td>
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<td>• Photophobia / phonophobia</td>
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Use of complementary therapies for paediatric headache is widespread, and most parents want their clinicians to be able to advise on such therapies even when they do not prescribe them. Despite this, there are no randomised controlled trials for herb-based remedies showing any benefit in childhood migraine. There is no convincing evidence of a link between biogenic amines and migraine but an oligoantigenic diet may benefit severely affected paediatric migraineurs resistant to other treatments. The importance of good sleep hygiene should be emphasised and may be enough for some children’s migraines to be prevented without recourse to medication, especially in pre-adolescents. Obesity, like migraine prevalent within the paediatric population, is thought to be a risk factor for chronic migraine but there are no studies as yet which determine the impact of weight loss on migraine frequency in the paediatric population.

Tension type headache

This is a poorly researched primary headache in childhood and adolescence but is probably more common than and at least as debilitating as migraine44 (Figure 4). Epidemiological evidence from large populations of adolescents with tension-type headache suggest behavioural phenotypes different to migraineurs: a high incidence of anxiety and depression, a tendency to derive stress from academic achievements,17 association with other physical symptoms and difficulties with family relationships.18 Opinion is divided as to whether migraine and tension type headaches represent distinct entities.

Medication overuse headache

This commonly encountered headache in children and adolescents should always be considered as a potential cause of chronic headache. It can occur with almost any headache attack treatment including tryptans, the latter tending to cause medication overuse more quickly than analgesics. Children and adolescents with medication-overuse headache frequently respond to medication withdrawal within a month.7

Short duration headaches

Recurrent headache, lasting seconds to minutes are rare in childhood, and can be difficult to classify according to IHS criteria as features are variable. There is no robust evidence base for management of short duration headache in childhood. Idiopathic stabbing headache is the most widely reported, and in childhood is less likely to be associated with other primary headaches than in adulthood.23 Like episodic and chronic paroxysmal hemicrania, idiopathic stabbing headache should respond to indomethacin. Cluster headache is rarer still, but as in adulthood appears to be responsive to a range of treatments including oxygen, tryptans, verapamil and diltiazem.25

Summary

This synopsis of paediatric headache shows how much is common to both childhood and adult headaches, but how they differ in presentation, differential diagnosis and treatment. Paediatric headache is the Cinderella of paediatric neurology specialties, but it is worthy of more attention and research, being so common and yet so disruptive to young people’s lives. Not before time, the National Institute for Clinical Excellence is now consulting on guidance for new onset headache in adults and adolescents, with guidance for headache in younger children follow on in the next few years. Follow progress at http://guidance.nice.org.uk/CG/Wave2/3.

References