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Childhood headache and *H. pylori*

A possible association

Background

The prevalence of *Helicobacter pylori* is thought to be about 40% in developed countries. However, rates are difficult to determine due to many cases being asymptomatic.

Objective

We present a case study in which eradication of *H. pylori* infection in a child, aged 7 years, was followed rapidly by resolution of the patient's recurrent headaches as well as gastrointestinal symptoms. Relevant literature regarding a possible association between *H. pylori* infection and migraine is discussed.

Discussion

Migraine is the most common cause of recurrent headaches in children. Previous reports have suggested a possible association between *H. pylori* infection and migraine. In the case study presented, *H. pylori* infection may have been associated with the child's recurrent headaches. Further research is required to confirm these anecdotal findings and to provide guidance for clinicians on whether recurrent headache in childhood is an indication for testing for *H. pylori* infection with a ¹³C-urea breath test and, if necessary, treatment with triple therapy.

Keywords

headache; nervous system diseases; microbiology; child, health

To exclude other causes, several investigations were initiated, including full blood count (FBC), urea, electrolytes and creatinine (UEC), comprehensive metabolic panel (CMP), liver function tests (LFTs), amylase, coeliac serology and urine culture, which were all normal. The authors were aware of previous reports of an association between *Helicobacter pylori* infection and headache, so we tested for this.

The result of the ¹³C-urea breath test (UBT) was 395 counts/minute (normal range <50 counts/minute), suggesting chronic *H. pylori* infection. The patient received a 2 week course of eradication therapy and all her symptoms resolved. At 6 week follow up, her UBT was 35 counts/minute (normal) and she was clinically well and no longer complained of either abdominal pain or headache.

The patient's mother was also found to be positive for *H. pylori*, with a UBT of 2395 counts/minute, and underwent eradication therapy. At follow up, she stated that she had not had any headaches or gastrointestinal symptoms since the treatment was completed.

Headache is a common complaint in paediatric medicine and according to a United States study, recurrent headache was associated with school absence, diminished academic performance and social problems.¹ The differential diagnosis of recurrent headaches in children includes migraine, tension headache, infective causes, psychosocial problems and rarely, malignancy.

Migraine in children

Migraine is the most common cause of recurrent headaches in children under the age of 6 years.² Frequent or severe headaches, including migraine,

Case study

A girl, aged 7 years, born in Australia of Caucasian origin, presented repeatedly over an 8-month period with dull, 'band-like' headaches, partially relieved by oral analgesics. They were not associated with photophobia, aura or vomiting. She also complained of intermittent diffuse abdominal discomfort, associated with nausea, which occurred independently of the headaches.

As the patient's mother suffered from migraine during her menstrual cycle, the possibility of recurrent migraine as a cause of her symptoms was considered. The mother also suffered separately from gastrointestinal symptoms, which she had attributed to self-diagnosed gluten intolerance.

have been reported in 17% of children and adolescents, and the prevalence of headache in general increases from childhood to adolescence, with an increase in the proportion of tension-type headaches from the early teen years.¹ It has been noted that children suffering from headaches are also disproportionately more likely to be diagnosed with certain comorbidities, such as asthma, other atopic disorders and frequent ear infections.^{3–5} There is an association between psychosocial problems and recurrent headache,^{6,7} however, it is not clear whether the headaches in this setting are causal, consequential or both.¹

Classic acute treatments for migraine include paracetamol, non-steroidal anti-inflammatory drugs, tryptans and antiemetics. Prophylactic treatments may include topiramate, propranolol or amitriptyline; potentially escalating to injections of botulinum toxin. Once a patient's migrainous tendency is controlled by a treatment regimen there is the risk of medication reliance, which can lead to analgesic overuse headache, sleep disturbance, weight loss or gain, or teratogenicity.⁸

H. pylori infection in children

Infection with *Helicobacter pylori* is generally acquired early in childhood, almost always before the age of 10 years,^{9,10} and generally via faecal-oral interfamilial transmission.¹¹ Although *H. pylori* is one of the most common bacterial pathogens in humans, its prevalence varies greatly worldwide. In developing countries as many as 90% of the population remain infected at the age of 40 years; in developed countries the figure is much lower, but is still thought to be about 40% at the same age.⁹ Exact figures in Australia are difficult to establish, as infection is often asymptomatic with *H. pylori* typically colonising the human stomach for many decades without adverse consequences. Untreated, infection tends to be lifelong.¹⁰

Universal screening is not recommended, but if *H. pylori* is suspected, diagnosis and treatment are straightforward. In children and adults, the ¹³C-urea breath test (UBT) is considered the best non-invasive diagnostic test for detection of *H. pylori* infection; stool and serologic tests are less reliable in the paediatric population.¹² The UBT is a highly sensitive, highly specific,

non-invasive test, which is accurate in children of all ages and suitable for use in primary care. However, it is important to note that non-invasive methods such as the UBT cannot rule out other differential diagnoses for gastrointestinal symptoms. Therefore, if the diagnosis is in doubt or symptoms do not resolve with eradication of *H. pylori*, endoscopy with histopathology is required.^{11,12}

Standard eradication treatment for *H. pylori* is with triple therapy:

- amoxicillin
- clarithromycin
- proton pump inhibitor.

The use of probiotics with standard therapy has been shown to significantly reduce the incidence of side effects, as well as conferring an additional 12% therapeutic benefit.¹¹ Reinfection after treatment is uncommon in developed countries, but occurs commonly in developing countries (1.9–9.0% incidence).¹¹

H. pylori and headache

A possible association between headache and *H. pylori* infection has been reported in both adult and paediatric populations. In a 1998 study of 200 adult patients, the prevalence of *H. pylori* in patients suffering from primary headache was found to be 40% and was particularly common in those with migraine without aura. In this study, eradication of *H. pylori* significantly reduced the frequency, intensity and duration of clinical attacks of headache.¹³

In another study, a group of 70 adult migraine patients, who also had gastrointestinal symptoms, were compared with a group of 60 matched controls, who had gastrointestinal symptoms but no migraine. Using endoscopy, *H. pylori* infection was found to be more prevalent in the migrainous group than in the control group (57.1% and 33.3% respectively). Interestingly, migraines improved in 84.6% of *H. pylori* infected patients after eradication treatment, compared with 75% of the *H. pylori* negative patients who were managed with common treatments for migraine.¹⁴ A further study found a strong association between more virulent strains of *H. pylori* and migraine with aura.¹⁵

A study of 49 adult outpatients suggested that *H. pylori* infection may be an independent environmental risk factor for migraine without

aura, particularly in patients who lack endogenous migraine risk factors, such as heredity or hormonal fluctuations.¹⁶

Conversely, one case control study suggested that chronic *H. pylori* infection does not modify clinical features of migrainous disease, and is not more frequent in patients with migraine than in controls.¹⁷

There has been considerably less research looking at the association of *H. pylori* infection and headaches in a paediatric population. We found one study that showed a significant correlation in 17 children who both suffered from headaches and were infected with *H. pylori* and became free of headache and migraine symptoms in the months following eradication therapy.¹⁸

Recurrent headache secondary to *H. pylori* infection has been postulated to be the result of systemic vasospastic effects of pro-inflammatory substances released from infected gastric mucosa.^{10,15} However, while vasospasm has been shown to occur in migraine, there is some controversy around the role of this mechanism in the causation of pain.¹⁹

Summary

Our patient's headaches had persisted for 8 months before improving after *H. pylori* eradication therapy, resulting in a marked improvement in her quality of life. However, this is merely an anecdotal finding, supported by weak evidence from a few small studies. Robust studies are required to:

- confirm a possible association between *H. pylori* and headache
- guide clinicians regarding the appropriateness of testing for *H. pylori* infection in the setting of recurrent headache in childhood and subsequent treatment with eradication therapy for *H. pylori* if present.

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