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Focus

Gastro-oesophageal reflux in children

Hugh Lees is a paediatrician at Tauranga Hospital

"Infants pulled mewling and puking from their mother's womb." –Shakespeare, The Seven Ages of Man, from The Merchant of Venice.

Vomiting is a common symptom in infancy, and when it occurs on a frequent and continuing basis is often due to gastro-oesophageal reflux.
Exclusion of other causes and a trial of medical management are commonly used to establish the diagnosis, as definitive investigations are invasive and not readily available.[1] Causes of vomiting in infants and young children can include infections, gastrointestinal obstructive or non-obstructive disorders, and metabolic disorders (see box below).
Gastro-oesophageal reflux ranges from the physiological reflux of gastric contents into the oesophagus which is cleared rapidly by normal peristalsis, to reflux that is more persistent and likely to cause disease.[2]

Making the diagnosis
Establishing a diagnosis of gastro-oesophageal reflux disease in children can be difficult. Not only is physiological reflux common, but children are unable to express their symptoms to indicate the presence of disease. Regurgitation of food is also common in infancy, and when small in volume and non-projectile, is referred to as "positing", a normal phenomenon requiring only parental reassurance.
Gastro-oesophageal reflux disease in infancy may present in several ways:

- failure to thrive due to excessive
- calorie loss
- respiratory complications such as apnoea or aspiration
- oesophagitis with associated haema-temesis or swallowing difficulty
- central chest discomfort (heartburn) which may result in irritability.

KEY POINTS

- When vomiting occurs frequently in babies, gastro-oesophageal reflux is possible
- Exclusion of other causes and a trial of medical management are commonly used to establish the diagnosis
- Forceful or later vomiting is more likely to be due to pathological reflux
- Excessive irritability, sleep disturbance and poor feeding may be suggestive of oesophagitis
- A trial of an antacid or an acid-reducing agent, with or without a prokinetic therapy, may be indicated, especially if there are symptoms suggestive of oesophagitis

As with any condition that presents in childhood, a careful history and physical examination are required to identify those infants whose symptoms might require further investigation.
In physiological reflux the vomiting is usually effortless, occurs shortly after feeding, and there is little distress. Vomiting that is more forceful or occurs later, ie, more than one hour after

feeding, is more likely to be due to pathological reflux. Excessive irritability, sleep disturbance and poor feeding may be suggestive of oesophagitis; such babies often feed hungrily to start with then fail to complete their feeds because of the associated discomfort.
Physical examination includes measuring current weight and plotting weight gain over previous months on a percentile chart.

CAUSES OF VOMITING IN INFANTS AND YOUNG CHILDREN

Infections
otitis media
gastroenteritis
urinary tract infections
meningitis

Gastrointestinal obstructive disorders
pyloric stenosis
malrotation
intussusception

Gastrointestinal non-obstructive disorders
gastro-oesophageal reflux
appendicitis
peptic ulcer disease
coeliac disease

Metabolic disorders

Investigations

Appropriate investigations are as follows:
Full blood count and **iron** studies check for the presence of iron deficiency anaemia.
In **pH monitoring**, described as the gold standard for diagnosis, the child is admitted overnight with a pH probe placed in the oesophagus. This measures the frequency and duration of reflux episodes (pH recorded <4 over a 12 to 24 hour period). This can often correlate reflux with other symptoms such as apnoea, wheezing or coughing. It is also helpful in identifying or confirming the so-called "silent refluxer" for whom symptomatic reflux is occurring in the absence of vomiting.
Because reflux is an episodic event, **barium swallow** is a low yield investigation. It is likely a result would be "normal" even though there may be symptomatic reflux. Its main purpose is to exclude other structural abnormalities that might cause vomiting. It also gives some idea of oesophageal and gastric motility.
Endoscopy and **biopsy** are rarely performed in infants due to their invasive
nature.
As pH monitoring and endoscopy are not readily available outside major centres and barium meal is not reliable, the diagnosis in a general practice setting is often made from the history alone and confirmed by a trial of medical management. If the trial is unsuccessful, further investigation is warranted.

Uncomplicated reflux

Uncomplicated gastro-oesophageal reflux usually resolves gradually between the ages of nine to 18 months. Parents should be reassured this is a common condition which rarely causes sequelae and does not require drug treatment. It is a nuisance but not necessarily a disease. Such children can often be classified as "happy vomiters", for the parents are often more affected than the child.
Parents should be advised to avoid excessive handling after feeds and to lay the infant in the cot in a slightly head-up position on their side. Thickening feeds can be a useful adjunct, and there are a number of pre-thickened formulas or proprietary food thickeners that may be used.

Medical management

Antacids are reported to be effective in treatment and when combined with alginic acid may reduce symptoms. Antacids in combination with thickened feeds should be the initial treatment in cases of mild symptomatic reflux.
Several agents that affect oesophageal and gastric motility are also used. These can be used with antacids or H2 receptor antagonists as the next step if the initial trial has been ineffective. Cisapride has been regarded as the agent of choice, although recently there has been a caution regarding the incidence of cardiac arrhythmia. It is recommended that an ECG be performed prior to prescribing cisapride to exclude conditions associated with QT prolongation.[3]
H2 receptor antagonists are particularly useful when symptoms of oesophagitis predominate. Because they inhibit acid production, symptom improvement may be delayed while the oesophagitis resolves. A trial period of at least two weeks is advised. More recently, proton pump inhibitors such as omeprazole have been used, although experience with these agents is

still limited.[4]

Surgery

Surgical management should be restricted to those infants for whom medical management has failed, and when potentially life-threatening complications are present. This applies most commonly to the child who is failing to thrive, but should also be considered in reflux complicated by symptoms of apnoea, recurrent aspiration or severe oesophagitis. Nissen fundoplication is the preferred surgical procedure.

CASE STUDY

Baby TG: 15 hospital admissions in a nine-month period.

First admission (at age four weeks)
? Apnoeic episode, symptoms of unsettled behaviour, persistent crying and small volume vomits.

Discharge diagnoses
Urinary tract infection; gastro-oesophageal reflux.

Social history
Four siblings under 10 years of age; father works during the day; mother works at night stocking supermarket shelves and tries to sleep during the daytime.

Discharge medication
Gaviscon infant powder, 1 sachet/120ml formula feed; cisapride 1mg/ml, 1ml four times/day.
Cotrimoxazole 240mg/5ml, 2.5mL twice daily.

Investigations
Renal ultrasound – right hydronephrosis.
Barium meal – "One large volume reflux occurred but was rapidly cleared and only one other small volume reflux was seen, otherwise normal study."
Micturating cystogram – bilateral vesicoureteric reflux, grade V on right side, grade III on the left.

Procedure
Bilateral ureteric reimplantation.

Progress
Recurrent hospital admissions for irritability, small volume vomits, parents having difficulty coping. Ranitidine prescribed and of modest benefit only. No failure to thrive. Recurrent hospital admissions continued.

Further investigation
24-hour pH monitoring. "There was significant acid reflux seen on this 24-hour study. There were 88 acid reflux events, six of these lasting longer than five minutes, with the longest being 38 minutes. The pH was less than 4 for 10.3 per cent of the 24 hours. These values are higher than normal values for this age and the calculated Biox-Ochoa score was 43.4, where a score of <11.99 is the 95th percentile. There was no alkaline reflux seen."

Surgery
Nissen fundoplication performed.

Outcome
One further admission for viral gastroenteritis following surgery.

Comment
On his initial admission it was thought that a urinary infection and associated hydronephrosis of the right kidney was the main cause of his irritability, with gastro-oesophageal reflux being of minor significance. However, his symptoms and recurrent hospital admissions did not resolve after urological surgery. Subsequent investigation established that his reflux was significant and his irritability was due to severe oesophagitis. His parents' lifestyle undoubtedly contributed to his recurrent hospital admissions, with his mother working at night and there being four other siblings under 10 years of age. His symptoms and hospital admissions resolved completely following his Nissen fundoplication.

Summary

The majority of infants presenting with symptoms of gastro-oesophageal reflux have simple reflux for which reassurance is all that is required. With persistent symptoms a trial of an antacid or an acid-reducing agent, plus or minus prokinetic therapy, may be indicated, especially if there are symptoms suggestive of oesophagitis. If there is any diagnostic uncertainty, a failure of conservative therapy or evidence of more severe complications, referral for paediatric assessment and further investigation is indicated.
Many parents remain concerned about their children with simple reflux despite their lack of symptoms other than vomiting. Referral for a second opinion and reassurance can be helpful in such cases.

References

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