Dr. Dean Huggard, Dr. Paul McNally, Prof. Billy Bourke, Dr. Seamus Hussey, Dr. Annemarie Broderick

Departments of Gastroenterology & Respiratory Medicine

GORD: Investigation and Management of Gastroesophageal Reflux Disease in Infants and Children

Aim

The purpose of this guideline is to present Doctors & allied health professionals with a common resource to aid in the overall assessment and management of GORD in children

Definition of terms

GOR, Gastroesophageal reflux is the movement of gastric contents into the oesophagus, with or without regurgitation or vomiting; GORD, gastro-oesophageal reflux **disease** is present when reflux is accompanied by symptoms (e.g. effortful regurgitation, retching, pain) and/or documented complications (e.g. oesophagitis, failure to thrive, pulmonary aspiration) that have a significant effect on the individual and require intervention; PPI, proton pump inhibitor; UTI, urinary tract infection.

Target patient population

- Children under the age of 16

Excluded:

- Children over 16 years of age
- Pre-term babies in NICU
- Children with Barrett's oesophagus

Target users

Doctors, nurses and allied health professionals working both in the hospital setting and in the community

Clinical Features

GOR is a normal physiologic process occurring several times each day in healthy infants, children, and adults. It is characterised by **effortless** regurgitation (no gagging, retching blood or bile). In contrast, The prevalence of GORD is higher in children with neurodevelopmental disorders, upper GI malformations (e.g. tracheooesophageal fistula, oesophageal atresia repair, hiatus hernia) cystic fibrosis, and a family history of complex GORD[1].

Presentation with suspected GORD is very common, demanding much of our time and resources as paediatricians; however despite its ubiquity in clinical practice, it can be poorly understood. In practice, the cost of treating suspected GORD is significant, and despite a lack of evidence, medical management of simple GOR is widespread.

The cardinal symptom in infants is vomiting, whereas older children tend to present more like adults; with substernal chest pain with or without regurgitation.

The following signs & symptoms may be seen in children with GORD:

- Vomiting – typically effortful
- Feeding difficulties - irritability, arching, reduced intake
- Growth faltering

- Recurrent Respiratory tract infections (if aspiration occurring)
- Chest/epigastric discomfort
- Sandifer's syndrome - spasmodic torsional dystonia with arching of the back and opisthotonic posturing

Assessment

There are three principal complications associated with GORD that need to be considered:

- Growth faltering
- Oesophagitis
- Pulmonary aspiration

In infants there is no symptom or symptom complex that is diagnostic for GORD. A common presentation in clinical practice is the infant who is crying, arching during feeds, refusing feeds and vomiting. These symptoms are commonly (and usually incorrectly!) attributed to GORD with the suspicion that acidic GOR is causing pain and irritability. In this group of children, a four week trial of an acid suppressive agent (see below) can help to determine whether acid GOR is the cause for the symptoms. A lack of improvement with this strategy suggests a different aetiology and acid suppressant treatment should be stopped.

Infants with persistent vomiting and faltering growth should have further workup even if they have a response to a trial of acid suppressive therapy.

In adolescents or older children a history and examination may allow a diagnosis to be made if the symptoms and signs are typical – including painful regurgitation, odynophagia, dysphagia, epigastric or retrosternal discomfort. Again in this group a clinical trial of acid suppression therapy will give very helpful information.

There are no pathognomonic features on history or radiological investigations for pulmonary aspiration. In fact there is currently no effective commercially available diagnostic test for pulmonary aspiration of gastric refluxate, and the assessment is based heavily on the clinical history.

The frequency and volume of GOR or vomiting is not helpful in the evaluation of GORD since a healthy infant can reflux or vomit very many times per day, have no other symptoms and thrive, whereas a child with a tendency to aspirate on refluxate, for example, may only reflux or vomit once a week but if this is aspirated can have troublesome consequences.

Differential Diagnosis

In the majority of children the diagnosis is straightforward and can be made on clinical grounds. One should always consider the following:

- Simple GOR. Characterised by **effortless regurgitation**, simple GOR occurs in most healthy infants[2], is usually mild and transient and decreases with age. No treatment beyond parental advice and support should be given to this this group.
- Non organic feeding disorder. This is a non-organic disorder characterised by refusal of feeds and irritability. There is often considerable parental stress or distress. Abnormal feeding practices often occur.
- Feeding disorders associated with oral and/or pharyngeal phase difficulties. Clinical feeding and swallowing assessment by a speech & language therapist +/- Videofluoroscopy is warranted.
- Infection
    - Gastroenteritis
    - UTI
    - Meningitis
    - Neonatal sepsis

- Intestinal obstruction
    - Pyloric stenosis
    - Malrotation
    - Oesophageal malformation
    - Intestinal atresia

- Eosinophilic oesophagitis
- CNS causes
- Drugs/ toxins
- Metabolic disorders

Differential diagnosis in older children/adolescents

- Rumination
- Eosinophilic oesophagitis
- Coeliac disease

Investigations

It is uncommon for children to need investigations in the assessment of GORD. Indeed, tests are unnecessary to confirm a diagnosis of GORD in those with typical clinical features. If other differential diagnoses (as above) are being considered, investigations should be tailored accordingly. Investigations are aimed at detecting the complications of GORD. **Demonstrating the presence or degree of GOR alone is not helpful** as this does not correlate well with symptoms or complications of GOR.[3]

It is important to remember that investigations are associated with potential adverse effects and morbidity, thus any tests ordered should contribute to establishing a diagnosis or a change in management.

Empiric trial of Proton Pump Inhibitor. In infants with typical clinical features suggestive of GORD, a **four week diagnostic trial of a PPI** is often very informative. PPIs reduce gastric acidity and symptoms associated with acid reflux, they do not stop the reflux occurring. Failure to respond to a trial of PPI treatment suggests the symptoms are not due to acid reflux. If treatment is not helpful patients should be weaned from their PPI, rather than increasing doses further or adding further agents.

Barium contrast studies. Barium studies **should never be performed to diagnose or exclude GOR** and cannot determine whether consequences of GOR are present. A barium swallow and follow through can be of help in excluding GI tract anomalies such as motility disorders and malrotation. Barium studies are associated with a significant radiation dose.

Oesophageal pH and intraluminal impedance monitoring. This test is rarely helpful in informing clinical management. Although this study can demonstrate the degree of acid and non-acid reflux, determining the degree of reflux does not correlate well with severity of symptoms or complications[3].

Upper GI endoscopy with biopsy. This test is invasive and requires a general anaesthetic in children. It is an effective way of determining whether oesophagitis is present, and is necessary in only a subgroup of children as determined by a paediatric gastroenterologist.

Special Considerations

One of the keys to successful management of GORD lies in good communication with parents. There is often confusion around this diagnosis and parents are sometimes given mixed messages by healthcare professionals. A clear explanation of the condition, its physiological basis and the role of the different treatments will likely reduce anxiety and confusion for the parents[4]. Some key points that need to be borne in mind at this stage include:

- Histamine receptor antagonists (H2RA - such as ranitidine) and proton pump inhibitors (PPI – such as omeprazole or lansoprazole) reduce gastric acidity but **do not reduce reflux.**
- No currently licensed medications have been consistently shown to reduce GOR

- Thickening of feeds can reduce vomiting and reduce the likelihood of aspiration from above but does not reduce the total time of oesophageal acidity[5].
- Prokinetic agents (domperidone, erythromycin) have no role in management of GOR[3].

General management advice

- Parents should be discouraged from switching formulas.
- Never change a breastfed child to formula.
- Prone position after feeding has been shown to improve the symptoms of GOR. However, this should only be done in awake children with parents present (never in sleeping or non observed infants because of the increased risk of SIDS)[2]
- Smaller more frequent feeds may reduce vomiting

Medical

All medications should be used on a trial basis, if found to be ineffective treatment should be discontinued. The only medication usually indicated is a trial of PPI or H2RA. In general, PPIs are more effective but take longer to work. H2RAs have a quicker onset of action, but exhibit tachphylaxis. They are effective for on demand use, particularly in older children. A four week trial of PPI is recommended as a first step. This should be given at a dose of 1-2mg/kg/day in a single or divided dose (see below), in consultation with the hospital formulary or BNFc. Doubling the dose if the medication does not eliminate symptoms **is not necessary or advised.**

Buffering agents e.g. gaviscon, sucralfate, alginate, can be used on demand in older children if effective. They are not recommended for long-term use.

Use of buffering agents (such as Gaviscon) in infant formula has not been shown to be of benefit, and is not advised.

Prokinetic therapy (metoclopramide, erythromycin, domperidone) is not recommended for routine use given the lack of evidence for their benefit in children[3], and the side effect to benefit ratio, but in exceptional circumstances a trial of these medications can be considered. Prokinetics are reserved for suspected or documented delayed gastric emptying, but these should be stopped if there is no benefit within 2 weeks.

Post pyloric feeding (naso-jejunal) is sometimes necessary in children with pulmonary aspiration; especially if it is determined that aspiration of gastric refluxate may be occurring. Due to a lack of a suitable diagnostic test for aspiration from below, a period of NJ feeding is warranted in some cases. Exclusive NJ feeding reduces aspiration risks both from swallowing and GOR.

Surgical

Surgical management of GORD is rarely required. In children with significant complications of GOR such as pulmonary aspiration not managed by conservative treatment alone, fundoplication can result in significant improvements in symptoms but is associated with some adverse effects. The adverse effects (post-fundoplication dysmotility, gas-bloat syndrome, dumping syndrome etc) and risk of symptom recurrence must be considered, especially in patients with foregut dysmotility and neurological impairment.

Key Practice Points:

- GOR is common in infants, and does not require any medical treatment
- GOR is effortless; the presence of effort/retching/heaving suggests GORD
- Formal diagnostic tests are rarely indicated in children
- A four week trial of PPI is a useful diagnostic test to determine if symptoms are caused by GORD/oesophagitis
- Medications are available to treat acidity of stomach contents, but no currently available medication has been proven to significantly reduce the amount of gastro-oesophageal reflux

Dosing Recommendations

Click here for dosing recommendations

Omeprazole

<2.5kg - 1-2mg/kg - consult paediatrician

2.5-5kg - 5mg daily

5-10kg - 10mg daily

10-20kg - 10mg daily

>20kg - 20mg daily

>12yrs - 40mg daily

Dose should be rounded to the nearest half tablet (5mg)

A liquid suspension (unlicensed) is available as a manufactured special. However, there is only limited evidence of its efficacy and Omeprazole MUPS® should be used where possible. The suspension is not currently stocked in OLCHC.

Please see appendix 1 for further licensing, preparation and administration information. This should accompany any prescriptions given out.

Lansoprazole (Zoton ® Fastab)

Lansoprazole can be used as second line if there are difficulties manipulating omeprazole for use.

<30Kg - 0.5 -1mg/Kg once daily PO in the morning, 30 minutes before food. Max 15mg once daily PO

>30Kg - 15 - 30mg once daily PO in the morning 30 minutes before food

Doses should be rounded to the nearest half tablet (7.5mg)

Please see Appendix 1 for further licensing, preparation and administration information. This should accompany any prescriptions given out.

Duration of treatment

PPI treatments should be reviewed 6-8 weeks after initiation with a view to discontinuation, particularly if there is no change in symptoms on medication. Even in the context of a clinical response to medication, a trial of discontinuation should be considered after a period of successful use as in many instances GORD symptoms may resolve over time.

Link to References

Link to Stakeholders