Gastrointestinal Distress Among Infants
Early-Life GI Distress

Functional GI conditions are a challenging group of symptoms that manifest due to an ongoing physiological development or maladaptive behavioural responses in infants, manifesting as distressful symptoms\(^1,2\)

**Common Causes of GI Distress During Infancy\(^1,2\)**

- Infantile colic
- Regurgitation
- Functional constipation

Need for Focus on Infantile GI Distress

Although GI distress are considered to be minor and self-limiting, they require much more attention in clinical practice\(^2\).

Aetiology of Infantile GI Distress

As these conditions are functional in nature, their aetiology remains largely unknown\(^1\)

<table>
<thead>
<tr>
<th>Common hypothesis suggest their association with(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age</td>
</tr>
<tr>
<td>Birth weight</td>
</tr>
<tr>
<td>Immature GI tract</td>
</tr>
<tr>
<td>Feeding habits</td>
</tr>
</tbody>
</table>

Owing to their vague aetiology among apparently healthy, well-fed and term infants, treatment of common GI distress can be challenging\(^{1,2}\)

Influence of Birth Weight and Gestational Age on GI Distress

**Aim:** To evaluate the influence of some variables on the onset of GI symptoms in infants.

**Study design:** 2879 infants from birth to 6 months of age were included in the study. The presence of constipation, diarrhoea, vomiting, regurgitation, failure to thrive and prolonged crying fits (colic) was recorded and the associated factors were evaluated.

<table>
<thead>
<tr>
<th>Association Between the Presence of Symptoms and the Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regurgitation</td>
</tr>
<tr>
<td>Low birth weight</td>
</tr>
<tr>
<td>Low gestational age</td>
</tr>
</tbody>
</table>

NS: No significant relationship

Low birth weight and low gestational age were the factors most frequently associated with the onset of GI symptoms in infants.

---

Early Insult to the Intestine May Translate to Chronic GI Disorders

Colic, regurgitation and constipation may be associated with low-grade mucosal inflammation, immune/motor alterations and dysbiosis, increasing the risk of IBS.\(^1\)

Biopsychological Causes of IBS\(^2\)

Source: Chumpitazi B et al., 2016

Infantile Colic
Infantile Colic: Definition

- A benign condition of uninterrupted, inconsolable crying for no apparent reason with continuous irritability and fussiness expressed among healthy and well-fed infants\(^1\)
- Reported in almost 10% to 40% of infants, peaking at about 6 weeks of age\(^2\)

**Wessel's Criteria\(^1\) (Rule of 3)**

Unexplained crying for

- More than 3 hours per day
- More than 3 days per week
- Longer than 3 weeks

**ROME III Criteria\(^3\)**

Unexplained crying for

- More than 3 hours per day
- More than 3 days per week
- Longer than 1 week
- No failure to thrive

The symptoms tend to aggravate during the evenings and manifest as a high-pitched, aversive and piercing loud cry\(^1\)

---

Aetiology of Colic

The cause of colic is mostly unknown

Various hypotheses map its cause to be associated with

- Alterations in the gut microbiota
- Intolerance to cow’s milk protein
- GI immaturity
- Increased serotonin
- Improper feeding techniques
- Maternal smoking

Mothers of colicky infants are at higher risk for postpartum depression and are more likely to stop breastfeeding early

Long-term Risks Associated With Colic

1. Increased risk of Functional gastrointestinal disorders (FGIDs)\(^1\)

2. Higher risk of allergic disorders\(^2\)

3. Higher risk of recurrent abdominal pain\(^2\)

4. Higher risk of regulatory problems that affect behaviour and cognition\(^2,3\)

## Current Prevention and Management Options

<table>
<thead>
<tr>
<th>American Academy of Family Physicians (AAFP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical Recommendation</strong></td>
</tr>
<tr>
<td>Parents should be educated about the benign and self-limited nature of infantile colic</td>
</tr>
<tr>
<td>The probiotic <em>Lactobacillus reuteri</em> (strain DSM 17938) may reduce crying in breastfeeding infants with colic</td>
</tr>
<tr>
<td><em>L. reuteri</em> DSM 17938 should not be given to formula-fed infants with colic</td>
</tr>
<tr>
<td>Elimination of allergens (e.g., cow’s milk, eggs, fish, peanuts, soya, tree nuts, wheat) from the diet of breastfeeding mothers may relieve colic symptoms</td>
</tr>
<tr>
<td>Switching formula-fed infants to a hydrolysed formula may improve colic symptoms</td>
</tr>
</tbody>
</table>

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion or case series

- Encourage continued breastfeeding
- Behavioural interventions such as swaddling, gentle rocking, vibration and motion can soothe some infants; however, no clinical evidence exists
- Soya formulas have been strongly discouraged
- Complementary interventions may be tried however with caution

Recommendations suggest various trial and error methods until the infant ‘outgrows’ the symptoms of colic

Infantile Regurgitation
Infantile Regurgitation: Introduction

- Also called gastroesophageal reflux or GER; is a benign involuntary condition characterised by passage of stomach contents into the oesophagus, without any underlying aetiology\(^1,2\)
- It is considered a normal physiologic process that occurs several times a day, mostly postprandial\(^1,2\)

**Prevalence of GER**

**Global\(^1,2\)**

About 70% to 85% of infants have regurgitation within the first 2 months of life, which generally resolves without intervention in 95% of infants by 1 year of age.

**India\(^3\)**

Nearly 50% of the healthy infants regurgitate at least once a day by 4 months of age, which gradually abates in 90% of them by 1 year of age.

GER is a common self-limited condition and the infants having this condition are frequently called ‘happy spitters’\(^1,2\)

---

Regurgitation: Pathophysiology 1,2

- Consumption of high volume of foods
- Immature lower oesophageal sphincter (LOS) function
- Abrupt decrease in LOS pressure
- Longer gastric emptying time
- Higher intra-gastric pressure
- Frequent transient spontaneous relaxations of LOS

Although physiological GER is associated with no complications, it may play a role in provoking pathological GER, also known as gastroesophageal reflux disease (GERD)

Differentiating GER From GERD

The ROME III criteria suggest GER when the following is present in healthy infants between 3 weeks to 12 months of age

1. Presence of any underlying aetiology or red flags indicates GERD

Regurgitation 2 or more times per day for 3 or more weeks

No retching, haematemesis, aspiration, apnoea, failure to thrive, feeding or swallowing difficulties or abnormal posturing

Continuous monitoring and eliminating the red flags remains the first line of approach, which can help in the treatment of infantile regurgitation

Current Prevention and Treatment Options

- Continued breastfeeding
- Continuous parental assurance, education and anticipatory guidance
- Lifestyle changes and maternal diet modifications such as exclusion of milk and eggs
- Altering feeding positions have also been helpful
- Use of thickened feedings
- Use of anti-regurgitant formulas

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion or case series

### American Academy of Family Physicians (AAFP)

<table>
<thead>
<tr>
<th>Clinical Recommendation</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>The diagnosis of GER and GERD should be based primarily on history and physical examination findings because other diagnostic tests have not shown superior accuracy</td>
<td>C</td>
</tr>
<tr>
<td>Conservative treatments are the first-line strategies for most infants, older children and adolescents with reflux and GERD</td>
<td>C</td>
</tr>
<tr>
<td>A trial of extensively hydrolysed or amino acid formula in formula-fed infants, or maternal dietary modification in breastfed infants, is warranted when reflux is presumed to be caused by an allergy to cow's milk protein</td>
<td>C</td>
</tr>
<tr>
<td>H2RAs are an option for acid suppression therapy in infants and children with GERD</td>
<td>B</td>
</tr>
<tr>
<td>PPIs are reasonable treatment options for GERD in older children and adolescents, but their use in infants is questionable because of a lack of proven effectiveness</td>
<td>B</td>
</tr>
</tbody>
</table>

GER requires a conservative, effective and prophylactic treatment approach

Functional Constipation
Functional Constipation: Introduction

- Constipation is defined as the delay or difficulty in defaecation present for 2 or more weeks\(^1\)

**ROME III criteria define infantile functional constipation as the presence of at least two of the following for a period of 1 month\(^2\)**

- Two or fewer defaecations per week
- At least 1 episode/week of incontinence after the acquisition of toileting skills
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large faecal mass in the rectum
- History of large-diameter stools that may obstruct the toilet

Most of the infants with constipation have no underlying causative factor, generally considered considered harmless\(^1\)

---

Functional Constipation: Pathophysiology\textsuperscript{1-3}

Habitual withholding of stools

Rectum stretches to accommodate the retained faecal mass

Weakened propulsive power of the rectum

Pain

Constipation and its associated symptoms gradually resolve in 60\% of the infants after the age of 1 year

## Current Prevention and Treatment Options

### American Academy of Family Physicians (AAFP)

<table>
<thead>
<tr>
<th>Clinical Recommendation</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>A history and physical examination are usually sufficient to distinguish functional constipation from constipation caused by organic conditions</td>
<td>C</td>
</tr>
<tr>
<td>Polyethylene glycol-based solutions (Miralax) are effective, easy to administer, non-invasive and well tolerated in children with constipation</td>
<td>A</td>
</tr>
<tr>
<td>Orally administered polyethylene glycol is recommended for disimpaction in children with functional constipation; this agent has been shown to be more effective than lactulose</td>
<td>B</td>
</tr>
<tr>
<td>The addition of laxatives is more effective than behaviour modification alone in children with constipation</td>
<td>B</td>
</tr>
<tr>
<td>The addition of enema to oral laxative regimens does not improve outcomes in children with severe constipation</td>
<td>B</td>
</tr>
<tr>
<td>Behavioural treatment is recommended as an adjunct to medical therapy in children with functional constipation</td>
<td>A</td>
</tr>
</tbody>
</table>

A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion or case series

- Continued breastfeeding
- Dietary changes are commonly advised, particularly increased intake of fluids, as a method to soften stools
- Fibre supplements
- Toilet training
- Enema is not recommended in infants

Close follow-up and dietary modification along with other tried therapies are recommended in the treatment algorithm

Looking Into The Pitfalls...
Gaps in Current Treatment Recommendations\textsuperscript{1-3}

- As the common infant GI distress such as colic, GER and constipation are placed in the zone of self-limiting conditions and their aetiology or pathogenesis have no general consensus, they have failed to make place in definitive treatment algorithms.
- Most of them suggest no intervention if the infant have positive weight gain and no associated red flags.
- However, some of them suggest various trial and error methods to help in symptomatic relief of symptoms.

The continuous alteration of medications, dietary manipulations, behavioural strategies and complementary interventions demand a more feasible and well-tolerated approach in the treatment of GI distress.

An Effective Nutritional Strategy Can Help in More than Just Symptomatic Relief of GI Distress¹-⁴

Targeted focus on the infantile GI tract suggests that the symptoms are often connected to each other.

Conventional therapies vaguely attempt to find temporary solutions, whereas nutritional components can help in long-term relief.

Nutritional management can be centralised among the prophylactic and imperative treatment options of GI distress in infants.

Addressing the problem of infantile GI distress may require the right feeding characteristics, thereby alleviating the condition.

Infantile colic, regurgitation and functional constipation are the common GI distress that occur during infancy.

Although GI distress are minor and self-limiting, these conditions need much more clinical attention.

GI distress in early life may be a risk factor for chronic GI disorders such as IBS and psychological problems later in life.

Current treatment modalities suggest only symptomatic relief without any specific intervention.

GI distress need more than just symptomatic relief to alleviate the prevalent condition.

Nutritional management can be centralised among the prophylactic and imperative treatment options of GI distress.
Thank You