

DIAGNOSIS AND MANAGEMENT OF INFANT COLIC**Mohamed Elsayed Ali Nasreldin Abbas¹, Abdelhadi A Abdelhadi²****Correspondence:* Mohamed Elsayed Ali Nasreldin Abbas*Received:* 09 Aug 2023; *Accepted:* 11 Aug 2023; *Published:* 13 Aug 2023

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Abstract

Infant colic is a common, spontaneously remitting condition. No definite aetiology is identified for infant colic, despite extensive research and observational studies. The Rome IV Pediatric committee established different diagnostic criteria to replace the traditional Wessel et al. "Rule of Threes" criteria. The aim of the new criteria is to facilitate clinical and research unity. Up to date, there is no known effective treatment for Infant Colic. The management frame include exclusion of organic causes, supporting the parents to understand the benign nature and the natural history of colic, enforcing parental support at home, and suggesting strategies to deal with the infant's settling. The pharmacological interventions have very limited role to play in the management if any. This include Simethicone, Probiotics and Hypertonic (30%) Glucose. The use of Dicyclomine Hydrochloride, Proton Pump Inhibitors, and H2 receptor antagonists is on no benefit. The probiotic Lactobacillus Reuteri DSM17938 may be trialled for exclusively breastfed infants, but the evidence for its benefit is inconsistent.

Keywords: Infant Colic, Simethicone, Probiotics, Dicyclomine Hydrochloride.

Introduction: Infantile colic has been traditionally identified by the "Wessel's Rule of Threes" as a clinical entity where an otherwise healthy infant presents with paroxysms of inconsolable crying lasting more than three hours per day, more than three days per week, for longer than three weeks¹. It is a diagnosis of exclusion after a detailed history and physical examination have ruled out identifiable organic pathologies². Colic affects at least 20% of infants with a peak at around six weeks of age^{3,4}. The majority of babies are symptoms-free by the age of 6 months⁵. **Infant colic** affects both sexes equally and bears no consistent relation to the breast or formula feeding^{3,6}. It occurs with

similar frequency in term and preterm babies and across all socioeconomic classes^{3,7}. The aetiology of **Infant Colic** is not known⁸. Suggested origins of the pain include lactose intolerance⁹, cow's milk protein intolerance¹⁰, gastrointestinal immaturity¹¹, alterations of faecal microflora¹², increased intraluminal gas¹³, increased serotonin secretion¹⁴, poor feeding technique¹⁵, and maternal smoking or nicotine replacement therapy¹⁶. **Infant Colic** has adverse associations including maternal depression, child abuse and early cessation of breastfeeding and is the strongest risk factor for shaken baby syndrome^{17,18}. Parental support and reassurance are the key components of the management of **Infant Colic**. Simethicone and Proton Pump Inhibitors are ineffective for the treatment of colic, and Dicyclomine is contraindicated. Treatment for breastfed infants with the probiotic **Lactobacillus Reuteri (strain DSM 17938)** may benefit some babies. Current evidence does not support chiropractic or osteopathic manipulation, head or abdominal massage, acupuncture, or herbal supplementations.

Diagnostic Criteria For Infant Colic:

The **Rome IV** Pediatric committee established different diagnostic criteria from the traditional Wessel et al. "Rule of Threes"²⁰. This is aimed to facilitate clinical and research unity. The **Rome IV** criteria for **Infant Colic** are as follows²⁰:

1. The episodes describe colic in infants from birth to 5 months of age.
2. The episodes consists of fussing or crying that start and stop without obvious causes.
3. The episodes last 3 or more hours daily, 3 or more days a week for 1 or more weeks.

4. The episodes are not associated with failure to thrive, fever or illness.

Aetiology and Epidemiology:

Despite its prevalence, a definite cause for **Infant Colic** is not yet identified¹⁷. The very numerous and differing theories regarding the aetiology, reflect the lack of uniformity in the definition of **Infant Colic**. A multifactorial origin of the colic is the most likely explanation¹⁹. The majority of the theories focuses on the gut as the source of pain or discomfort⁹⁻¹⁶. These include gastroesophageal reflux, cow's milk protein intolerance, lactose intolerance, food allergy, alterations of faecal microflora, gastrointestinal inflammation, increased serotonin secretion, poor feeding technique and maternal diets containing cow's milk⁹⁻¹⁵. Other researcher theorised extra gastrointestinal causes including immaturity of the central nervous system, sleeping disruption, hypersensitivity to the environment, sensory overload, and the effect of maternal nicotine exposure²¹. Moreover, some researchers linked **Infant Colic** to psychosocial factors including inadequate parental interactions, family tension, and parental anxiety. Interestingly, there is a growing body of evidence linking **Infant Colic** to migraine physiology. This is supported by epidemiological studies showing an association between **infant colic** and the later development of childhood migraine²².

Presentation: **Infant Colic** typically presents in the second or third week of life and peaks around 6 weeks of age. Repeated bouts of inconsolable crying, irritability, and screaming without any obvious cause are the usual pattern. The episodes tend to cluster in the evenings with the affected infant ap-

pearing red-faced, drawing up the legs and tensing up the abdomen. The parent's traditional methods of calming are often unsuccessful in relieving the infant's distress. The parents are often anxious, confused by the conflicting advices, stressed and exhausted by the repeated inexplicable encounters. **Infant Colic** resolves by the age of 12 weeks in 60% of infants and in 90% by the age of 16 weeks.

History: A detailed and focused history is essential. The description and frequency of the bouts should be noted. The clinician should ask direct questions in relation to fever, feeding pattern and volumes, weight gain, vomiting, constipation, intermittent explosive diarrhoea, bloody stool, and smelly urine.

Examination Findings: The physical examination in **Infant Colic** should be completely normal. The presence of failure to thrive dismisses the diagnosis of **Infant Colic**. The clinician should perform a detailed head-toe examination. Particular areas of focus include: mouth for oral thrush or torn frenulum, eyes for corneal abrasions, abdominal distension or tenderness, scrotal or inguinal swellings, foreign body in the ear, nose or other places, anal fissure, bony tenderness, burns and or suspicious bruises.

Investigations: The diagnosis on **Infant Colic** can be made confidently, without any investigation. However, the description and findings should be consistent with the **Rome IV** criteria. The presence of atypical history or findings on clinical examination may cast doubt on the diagnosis. Selective tests are then justified to confirm or rule out other diagnoses.

Management:

The management lines of **infant Colic** including the pharmacological therapies are controversial and not evidence based. In fact no medication has definitively proved beneficial in treating **Infant Colic**¹⁸. Therefore, the pillars of management rest on parental support, reassurance and education. The reassurance is firmly built on the self-limiting and benign nature of **Infant Colic**. The parents should be encouraged to develop non-stressing coping mechanisms as the bouts of crying may be intolerable.

Non-Pharmacological Management:

1. The use of **various manoeuvres** to soothe an infant with colic has variable and inconsistent results. Nevertheless, the parents should be supported to try some of these harmless manipulations. These include gentle rocking, patting, white noise, soothing music, a car ride, swaddling with the legs flexed, reducing the lighting in the room, and placing the baby in a swing^{2,3,4}.
2. **Colic Calm:** This solution is based on charcoal and other naturally occurring ingredients. Evans et al²³ claims a highly significant effect of Colic Calm when administered for 14 days. The dose is 1.25 mg (1.25 ml) with each episode of crying to a maximum of 6 doses per day.
3. The use of **Hydrolysed Infant Formula** instead of standard infants formula is not supported by any evidence based study. The usual practice is a trial of 2 weeks of totally or partially hydrolysed formula.
4. **Maternal Diet Restriction** in breast-fed babies yielded conflicting results in multiple studies. The mother is usually instructed to follow a low allergen diet for 2-3 weeks. This diet excludes or

limits the maternal ingestion of milk and dairy products, soy, egg, peanut, wheat, and shellfish.

5. The use of **Lactose Free Formula** or **Lactase Drops (Colief)** is practised by many physicians. A positive response indicates the diagnosis of Lactose Intolerance and not **Infant Colic**.
6. **Homeopathic Therapy** has no proven effect on **Infant Colic**. This is true as well of chiropractic or osteopathic manipulation, head or abdominal massage, and acupuncture. While the effectiveness of massage is not established, it a safe, cost free and simple intervention that may improve parental-infant bonding and may be used side by side with other interventions.

Pharmacological Management:

1. **Simethicone:** Despite the widespread use of Simethicone drops, many randomized controlled trials found that they are no better than placebo.
2. **Dicyclomine Hydrochloride** oral solution should be avoided altogether due to the associated serious side effects. These include hypotonia, breathlessness, respiratory collapse, apnoea, and seizures.
3. **Probiotics:** There is no clear evidence that probiotics are more effective than placebo at preventing **Infant Colic**. The use of *L. reuteri* **DSM 17938** may be tried for 2 weeks initially as a treatment option for breastfed infants, but is likely to worsen the colic in formula-fed infants.
4. **Cimetropium Bromide** use is not advisable due to the associated lethargy and sleepiness.
5. **Trimebutine** (weak opioid with antimuscarinic effects) is not recommended due to the serious side effects of the options.
6. **Hypertonic (30%) Glucose** in a dose of 1 ml per

crying episode is used by some clinicians with meagre support from randomised controlled studies.

7. **Proton Pump Inhibitors** or **H₂ receptor antagonists** are found to be no better than placebo in many randomized controlled trials. They should be avoided.

Conclusions: **Infant Colic** is a benign, self-limiting condition which occurs in at least 20% of infants below the age of 5 month. The Paediatricians and family physicians are encouraged to use the diagnostic criteria for **Infant Colic** as per Rome IV Paediatric committee. **Infant Colic** is a diagnosis of exclusion where a detailed history and physical examination have ruled out identifiable other diagnoses. In the absence a definite effective remedy of **Infant Colic**, parental support and reassurance remain the mainstay of the management. There is no adequate evidence to support the use of hydrolysed infants formula, lactase drops or Lactose free formula, chiropractic or osteopathic manipulation, infant massage, swaddling, acupuncture, or herbal supplements. The clinicians needs to be aware of the limitations of various pharmacological interventions including Sime-thicone, Probiotics and Hypertonic (30%) Glucose. The use of Dicyclomine Hydrochloride, Proton Pump Inhibitors, and H₂ receptor antagonists is on no benefit.

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Conflict of Interest : There is no conflict of interest.

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