The crying baby

Excessive or inconsolable crying in infants

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Infant colic is a challenging presentation for clinicians who are busy and time constrained. However, caregivers are often stressed and worried about a sinister problem in their child. GPs can best manage both caregiver and infant through a structured approach to excessive or inconsolable crying, including how to determine normal presentations from those requiring investigations, targeted treatments and additional input from other clinicians.

MedicineToday 2020; 21(7): 39-43

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Although crying is a normal physiological behaviour for infants, concern over excessive crying in the first few months of life is one of the most common presentations to a health service.[1] Unsettled infants are associated with the use of multiple health services in Australia, and worldwide estimates indicate a prevalence of about 20% across multiple societies.[1,2] An unsettled infant causes significant distress to the entire family and has strong associations with postnatal depression, poor attachment, early cessation of breastfeeding and risk of nonaccidental injury.[3-5] Although only about 5% of infants with excessive or inconsolable crying have an underlying organic cause, it is essential to correctly identify those who require investigation and/or targeted treatment.[6] All infants who present to a health service for excessive or inconsolable crying require assessment, and caregivers require education and counselling, along with follow up to monitor progress and provide ongoing support.

Normal crying patterns

Normal crying duration peaks at around 1 to 2 months of age.[7] The crying periods can last for several hours and are often associated with increased crying in the afternoon and evenings. Many infants will draw their legs up, as if in pain, which can cause caregivers concern but is not associated with any underlying pathology. For most infants, the frequency and duration of crying declines by around 4 to 5 months of age, with no subsequent long-term adverse effects.[8,9] Difficulty settling beyond this period is less common but is associated with later problems such as sleep concerns, behavioural difficulties and parental mental illness.[10-13]

What is colic?

Infant colic is a term used to describe excessive or inconsolable crying without an underlying organic cause. Some babies cry

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1. 4TH EDITION ROME CRITERIA FOR INFANT COLIC[16]

For clinical purposes, diagnostic criteria for infant colic must include all of the following:

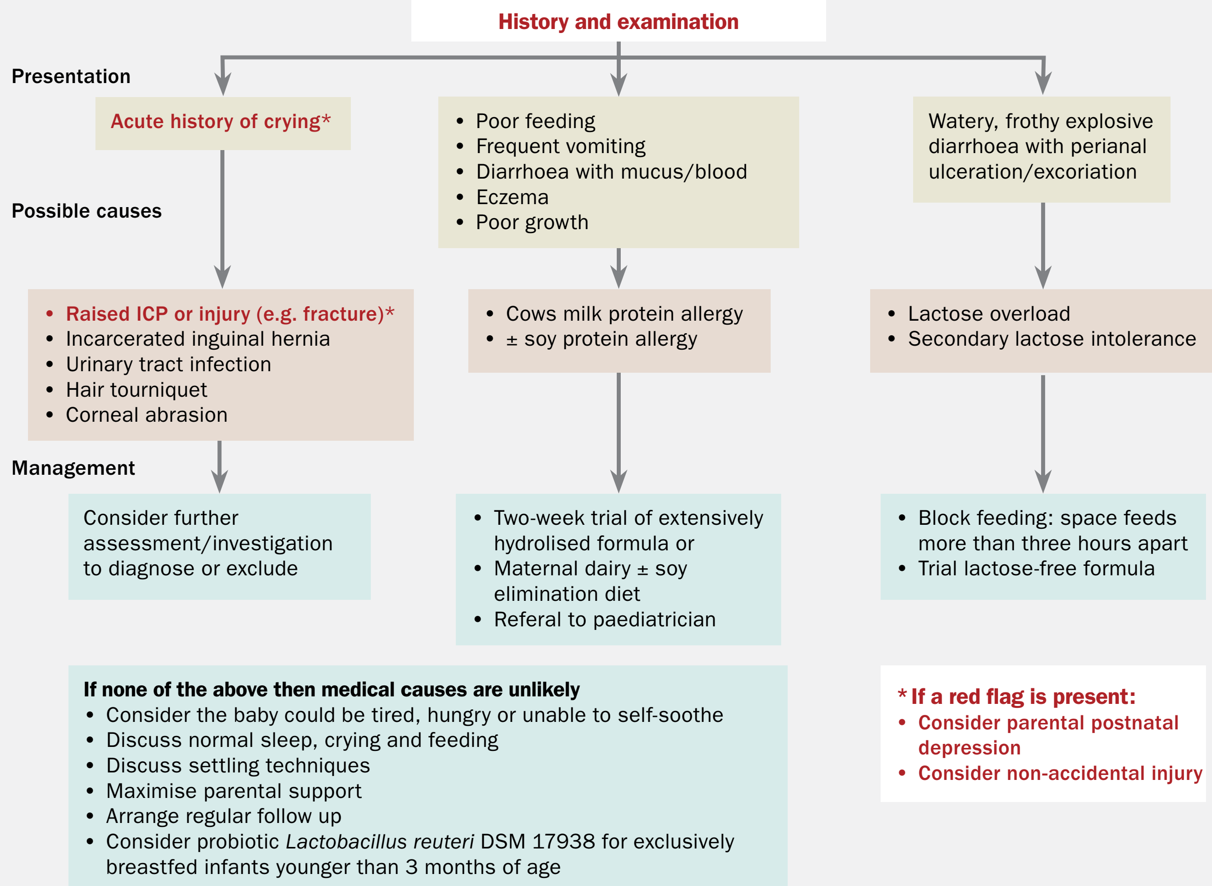
1. An infant who is less than 5 months of age when the symptoms start and stop
2. Recurrent and prolonged periods of infant crying, fussing* or irritability reported by caregivers that occur without obvious cause and cannot be prevented or resolved by caregivers
3. No evidence of infant failure to thrive, fever or illness

* 'Fussing' refers to intermittent distressed vocalisation and has been defined as 'behaviour that is not quite crying but not awake and content either'. Infants often fluctuate between crying and fussing, so these are difficult to distinguish in practice.

more than others but this does not mean something is wrong. Assessment protocols have moved away from strict criteria such as Wessel's rule of 3s (crying 3 hours per day, for more than 3 days per week, for 3 or more weeks) because of its limited practical use.[14] Parental reports of inconsolable crying are shown to have greater validity than the number of hours of crying, and also have a stronger association with related concerns such as postnatal depression.[15] This is reflected in the most recent Rome IV criteria detailed in Box 1.[16]

What causes infant colic?

No single cause for why some infants are more unsettled than others has been identified. Previous research focused on excessive crying as a normal part of development and temperament, while other studies have sought a neurological explanation in which the gut–brain axis is producing the unwanted symptoms. More recently, the role of gut microbiota in infant crying has been explored. Some studies suggest infants with colic have increased Gram-negative bacteria and decreased *Escherichia* and *Lactobacillus* species compared with infants with low to average crying patterns.[17] Of interest, one particular strain of probiotic has been recently shown to benefit exclusively breastfed infants with colic.[18] However, a great deal remains unknown about the impact of gut flora on excessive crying in infancy.



Abbreviation: ICP = intracranial pressure.

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Clinical assessment and management

A thorough history and examination is essential in infants who present with excessive or inconsolable crying. The information gained from these two aspects of the assessment should enable clinicians to identify the minority of infants who may have an underlying organic cause (Flowchart[19]). Key elements for assessing excessive or inconsolable crying are listed in Box 2.

The most important part of the assessment is to exclude any possible organic causes of crying (Table). The three most commonly discussed organic causes are cow/soy milk protein allergy, lactose overload and gastro-oesophageal reflux disease (GORD).

Cow/soy milk protein allergy

Allergy to cow milk protein accounts for less than 5% of cases of infants who present with excessive crying.[21] A significant number of infants with cow milk protein allergy will also be allergic to soy protein.[22] This diagnosis should only be considered if the infant has other symptoms such as mucous or blood in stools, poor feeding, failure to thrive, significant vomiting, eczema or a family history of atopy.[23] In such cases there should be a strict two-week trial of dietary change, either with maternal exclusion of all dairy and soy or a change to hypoallergenic formula for infants who are formula fed. A diagnosis can be confirmed if symptoms return when diary is reintroduced at the end of the trial.[24] It must be noted that maternal dietary restriction can be challenging and careful consideration must be made about what best suits the mother and the baby.

Lactose overload

The symptoms of lactose overload or lactose intolerance are explosive, watery and frothy diarrhoea along with perianal excoriation.[25] In infants, lactose overload commonly occurs when breastfeeds are small and frequent, resulting in the high lactose foremilk making up most of the infant's intake. Most infants will improve with modified breastfeeding regimens that increase the time between feeds and increase hindmilk intake. Primary lactose intolerance in infants is exceedingly rare. Secondary lactose intolerance can occur in the context of gastroenteritis or cow/soy milk protein allergy. Management involves excluding the primary cause of the lactose overload, and infants may need a transient trial of lactose-free hypoallergenic formula. Importantly, there is a lack of evidence for the use of lactase in such patients.[26]

A significant number of infants with cow milk protein allergy will also be allergic to soy protein

Gastro-oesophageal reflux disease (GORD)

Gastro-oesophageal reflux (GOR) is physiological passage of gastric contents with or without regurgitation and vomiting; it is a normal process in infancy. Importantly, GORD should only be considered when GOR causes complications such as poor weight gain, difficulties feeding, frequent vomiting or haematemesis.[27] Multiple studies have found no association between GOR/GORD and excessive crying.[28] One study tested 151 infants with excessive crying using oesophageal monitoring and found no association between crying and the number of episodes of reflux.[29] Antireflux medications have been shown conclusively to be ineffective as a treatment for GOR or excessive crying.[30] In addition, such medications may also be associated with adverse effects such as increased infections, allergies, hospitalisations and osteoporosis.[31,32] There is evidence of overprescribing of antireflux medications in Australia despite their risk and lack of effect.[33] They should not be used in infants with excessive crying, noting that anecdotal evidence of success often coincides with the normal reduction of crying after 1 to 2 months of age. Antireflux medications may be of some

2. KEY ASPECTS OF ASSESSING EXCESSIVE OR INCONSOLABLE CRYING IN INFANTS

History

- Antenatal and birth details including risk factors for sepsis
- Feeding type (breast/formula), volume, frequency, duration, vomiting (including blood or bile-stained)
- Crying pattern, duration, associations (such as during feeds), soothing technique
- Sleep duration and pattern
- Stool frequency, consistency, difficulty passing, mucous, blood
- History of rash, eczema, perianal excoriation
- Family history of atopy
- Postnatal depression (screen all caregivers with tool such as Edinburgh Postnatal Depression Scale[20])

Examination

- Observe general appearance, unsettled behaviour, attachment, caregiver-infant interactions and soothing techniques
- Assess growth (height, weight and head circumference), hydration and fat distribution
- Assess general tone, strength and responsiveness to external stimulus
- Measure head circumference and fontanelle for macrocephaly/hydrocephalus
- Eye examination for foreign body
- Ear examination for otitis media
- Oropharyngeal examination for thrush and tongue tie
- Cardiovascular exam for murmur or abnormal rhythm
- Abdomen examination for distension, hernia, tenderness, bowel sounds
- Entire body examination for eczema, hair tourniquet, testicular torsion, bruising

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TABLE. ORGANIC CAUSES OF EXCESSIVE OR INCONSOLABLE CRYING

Causes	Additional clinical features
Possible organic causes	
Cow/soy milk protein allergy	• Significant vomiting • Feeding difficulties • Diarrhoea, mucous or blood in stool • Poor weight gain • Extensive eczema • First-degree relative with history of atopy
Gastro-oesophageal reflux disease	• Frequent significant vomiting (more than five times per day) • Haematemesis • Feeding difficulties • Poor weight gain
Lactose overload or secondary intolerance	• Explosive, watery, frothy diarrhoea • Perianal excoriation • Frequent feeding
Acute organic causes	
Infections, such as UTI, otitis media, meningitis	• Fever • Lethargy • Poor feeding • Poor weight gain • Perinatal risk factors for sepsis
Raised intracranial pressure (e.g. hydrocephalus)	• Increasing head circumference/ macrocephaly • Vomiting • Lethargy
Inguinal hernia	• Vomiting • Lump in inguinal region
Pyloric stenosis	• Projectile vomiting • Usually 2 to 6 weeks of age
Intussusception	• Acute onset of vomiting, pallor, irritability • Abdominal mass • Rectal bleeding
Intestinal malrotation	• Acute obstruction • Vomiting may be bilious • Distension
Heart failure	• Tachycardia • Tachypnoea • Pallor • Poor perfusion
Nonaccidental injury	• Bruising or petechia
Hair tourniquet	• Hair tourniquet around extremity
Foreign body in eye	• Acute distress • History of injury to eye

Abbreviation: UTI = urinary tract infection.

3. EDUCATING CAREGIVERS ON INFANT COLIC

- Acknowledge the caregivers' concerns, observe the infant's behaviour and offer ongoing support.
- Educate caregivers about normal crying patterns, describing the peak of inconsolable crying at 6 to 8 weeks of age regardless of parenting style or underlying cause.
- Help identify early signs of tiredness in the infant and use of appropriate settling techniques.
- Reassure caregivers that even though the crying may continue, soothing techniques will still provide comfort and security to their baby. It is especially important to discuss the stress that an inconsolable infant can cause and ensure avenues for help and support are available at all times.
- Decide on a plan moving forward that includes monitoring the infant's growth and development, settling techniques and family functioning.

benefit in infants with true GORD but care must be taken in their use. When true GORD is suspected, it is worth considering dietary change for the possibility of cow/soy milk protein allergy as the primary pathology.[34]

Probiotics

There has been promising evidence for the use of probiotics by mothers of infants with colic; however, it is important to note that these results are strain-specific. If the infant is exclusively breastfed, a three-week trial of *Lactobacillus reuteri* DSM 17938 can be considered.[18]

Investigations

Most infants do not require any investigations after a careful assessment of history and examination.[6] If there are concerns of any of the organic causes discussed above, then the appropriate clinical pathway should be chosen for the presentation (Table).

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Education and discussion with family

For most infants, the symptoms of colic will gradually reduce after 2 months of age and resolve by 5 months of age.[23] Initial management requires careful education and explanation to the family that organic causes have been excluded, while offering ongoing clinical support (Box 3). Families are vulnerable to feeling dismissed at this time and an opportunity to provide reassurance requires listening to concerns, gentle instruction and ongoing monitoring. Caregivers may require additional local community support from services such as maternal child health, allied health clinicians or even inpatient admission to parenting centres or mother-baby units, especially caregivers with evidence of postnatal depression.

When to refer

Urgent referral should occur if the child is acutely unwell or an underlying organic cause such as sepsis, intussusception or nonaccidental injury is suspected. In addition, urgent referral is required if there is concern of harm to the child or caregiver due to postnatal depression or stress. A referral to a paediatrician is indicated if there is uncertainty about the diagnosis or if additional clinical support is required, such as for a trial of a hypoallergenic formula requiring a specialist prescription.

Conclusion

Caregivers presenting with concerns about excessive or inconsolable crying in their infant are a frequent challenge for primary care physicians. Although most infants do not have an underlying organic cause requiring investigations or medications, all will need a thorough and gentle history and examination. This not only ensures best practice, but also demonstrates to worried caregivers that their clinician is attentive and practising evidence-based medicine. Assessment must incorporate the entire family, especially given the high prevalence and risks associated with postnatal depression. Often the most essential aspect of care is organising follow up so that caregivers feel their concerns are genuinely heard and they have an avenue to seek further reassurance. MT

References

A list of references is included in the online version of this article (www.medicinetoday.com.au).

COMPETING INTERESTS: None.

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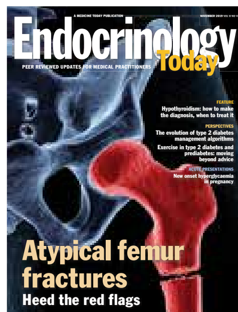

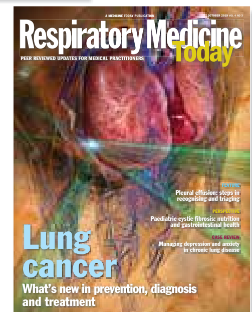

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