



ORIGINAL PAPER

Cry babies: A framework for chiropractic care

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Received 14 June 2007; accepted 12 July 2007

KEYWORDS

Chiropractic;
Infant behaviour;
Colic;
Sleep disorder;
Unexplained infant
crying

Summary With 21% of parents taking their excessively crying infant to a healthcare professional, chiropractors are often selected to treat these infants. The personal, family and social costs of this crying syndrome are high, yet there is no agreed treatment protocol. A large number of studies have been aimed at providing useful interventions, but no “cure” has been demonstrated. With some evidential backing, chiropractors are well-placed to provide therapy for this syndrome. A seven-step process of thorough history (including ante-natal and natal factors), administration of depression index to the mother, examination of the infant to rule out illness, differential diagnosis, specific treatment plan for specific disorders, therapeutic trial and reassurance to the parents provides a rational framework for appropriate chiropractic care of this enigmatic and problematic condition.

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Introduction

A remarkable number of infants suffering from excessive and unexplained crying are brought to healthcare professionals. It is the most common presentation to paediatricians in the first 16 weeks of life and a recent prospective study of 483 infants shows that 19.1% are afflicted with a crying syndrome.¹ Despite the most conscientious efforts to console the child, concerns that the child is experiencing pain drive the parents to seek help. Many parents choose alternative/complementary approaches including chiropractic care after initial presentation to their GP or paediatrician.^{2,3} It is the inexplicable nature and persistence of the crying

that makes everyone uncomfortable, even the doctor who is asked to “cure” the child of his/her ailments. Morris reported in 2001 that the annual medical costs to the National Health Service (NHS) in the UK for treating crying babies are substantial (£65 million)⁴ and that this cost does not account for additional expenditures linked to over-the-counter medication and multiple alternative therapies sought by parents for their child. Further, costs of lost work and lost sleep additionally create a huge social burden. The excessively crying baby is an enigmatic problem, driving 21% of families in the UK to seek care.⁴ However, the evidence-base concerning possible interventions (Table 1) offers little help for the condition.^{5–8}

Not only is this condition stressful for the parent and linked to post-natal depression,^{9,10,20,21} but also potentially puts the child at risk, being the leading cause of Shaken Baby Syndrome.^{11–13} A number of

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Table 1 Applying the evidence to care of cry babies

<p>Pharmaceutical interventions</p> <ul style="list-style-type: none"> 3 RCTs showed no benefit of simethicone⁵ 1 RCT showed no benefit of methylscopolamine⁵ 2 RCTs showed benefit of dicyclomine, but this has been removed from the colic market by Merrel Dow, the manufacturer, due to serious side effects (including coma and death)⁵ <p>Dietary interventions</p> <ul style="list-style-type: none"> No significant difference between breast feeding and bottle feeding (inconclusive) Conflicting evidence on elimination of cow's milk in mother's diet^{5,63} No definitive evidence that hypoallergenic milk helps those without cow's milk protein intolerance (CMPI)³³ Evidence for use of soy formula is conflicting, with no high quality trial⁵ 2 RCTs of lactase enzyme showed no reduction in symptoms⁵ Fibre-enriched formula shows no reduction in crying symptoms⁵ 1 RCT shows that herbal teas may be soothing, but there are issues that the need for high consumption (32 mL/kg/day) creates a nutritional concern as well as contamination concerns^{5,64} <p>Behavioural interventions</p> <ul style="list-style-type: none"> Despite many studies, there are no data that support supplemental carrying of the infant, riding in the car or car simulators, swaddling or intensive parent training⁶⁵ <p>Chiropractic treatment</p> <ul style="list-style-type: none"> 3 low level RCTs showed a decrease in crying level with manual therapy^{23,25,26,28} 1 high quality RCT showed crying reduction is no better than massage (both reduced crying times)²⁴
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other risks for the irritable infant have been identified (Table 2).^{14,15}

Clinicians are trained to help and support patients and are expected to "do something" to offer relief. At a minimum, realistic reassurance must be given; at best, clinicians are called upon to provide interventions or management plans that result in elimination or at least reduction of symptomatology. In this context, it is frustrating for all concerned when clear answers and reassurance supported by robust evidence are not available.

At the Anglo-European College of Chiropractic, a majority (63%) of children who presented at the teaching clinic (out of approximately 5000 infant paediatric visits annually) suffer from unexplained crying (Fig. 1). To address this common presentation, a framework of conservative care was developed in the college teaching clinic (Table 3) and is described as possible aid to the clinician who cares for infants with this problem.

Table 2 Risks for cry babies

<ul style="list-style-type: none"> Infants taken off breast milk¹⁴ Infants put prematurely on solid foods¹⁴ Infants given unnecessary invasive testing¹⁴ Infants treated with unnecessary medication¹⁴ Mother more likely to have postnatal depression^{14,20} Increased risk for Shaken Baby Syndrome, abuse¹¹⁻¹³ Risk for long term developmental problems^{70,74-76} Risk for long term family disruption^{70,76,77} Insecure infant attachments^{14,20}

Defining the problem

Traditionally, the persistently crying infant has been diagnosed with "infant colic." Wessel, in 1954, defined infant colic as "bouts of crying amounting to more than 3 h a day for more than 3 days a week for more than 3 weeks."¹⁶ Although useful for research purposes, this is not a very practical definition when faced with a distressed parent. Few parents will actually wait three weeks before consulting a clinician. Further, the diagnosis of colic implies a gastro-intestinal (GI) disorder; however, these infants seldom have signs of any specific clinical condition pertaining to GI dysfunction that could cause "colic." Given the relative absence of any gut spasm, it is possible that the diagnosis of

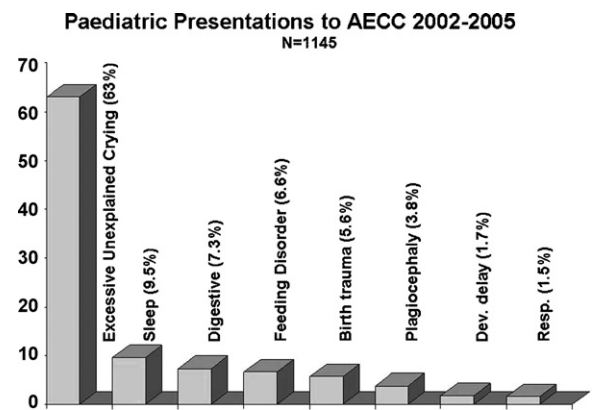


Figure 1 Distribution of paediatric presentations to the AECC clinic (%).

Table 3 Seven step framework of chiropractic care for cry babies

1. Thorough history to discover relevant intra-uterine constraint or birth trauma factors
2. EPDS^a to detect depression in the mother (refer if indicated)
3. Complete examination including vital signs and review of growth chart to rule out illness (refer if found)
4. Differential diagnosis
5. Create plan of management for a therapeutic trial of 2 weeks
6. Treat any musculoskeletal or biomechanical disorder
7. Give advice for GOR^b or CMPI^c and further advice for at-home techniques to relieve the crying

^a Edinburgh postnatal depression survey.

^b Gastro-oesophageal reflux.

^c Cow's milk protein intolerance.

colic remains only a category within which the crying infant may be conveniently, though incorrectly, placed.^{17,18} Perhaps this term should be abandoned. To more accurately describe this syndrome, we have labelled it Infant Fuss-Cry-Irritability with Sleep Disorder Syndrome (IFCIDS). Table 4 describes the common characteristics of the irritable infant syndrome. This term (IFCIDS) is merely descriptive at this point as we are not able to say conclusively why it occurs nor can we predict when it will occur. A complaint of excessive crying is accepted by the clinician if the parent experiences it as such. This is clinically appropriate because it has been found that when parents say their child cries excessively, in fact, they do.¹⁹ Parents spend considerable time and energy trying to soothe their baby. Parents who cannot console their child may feel inadequate and/or may become depressed over time,^{9,10,20,21} possibly exacerbating the problem for both the child and parent. The clinician should strive to understand and validate both child and parent and work to alleviate fear and distress in the family as deterioration of the family situation is common

Table 4 Common characteristics of infant fuss-cry-irritability with sleep disorder syndrome (IFCIDS) in infants

1–6 months of age (seen less frequently 7–12 months of age)
 Gender: male predominant (60:40)
 Paroxysmal fuss, cry patterns which are not easily consoled
 High intensity, piercing cries are common
 Crying peaks in evenings, but may occur throughout the day
 Many episodes of crying as well as long bouts of crying
 Feeding patterns: breast, formula or mixed
 Feeding problems common
 "Pained faces" (facial grimaces) accompany crying
 Body unrest, flailing limbs, raised knees, clenched fists, arching postures, general irritability
 Sleep disorders common (difficulty falling asleep and staying asleep)

with persistent crying, even as long as two years later.¹ In this context, administration of the Edinburgh postnatal depression survey (EPDS) is recommended for use by all clinicians who encounter distressed mothers of paediatric patients.²²

Role of the chiropractor

The chiropractor is well-placed to assist the parent and infant in identifying contributing factors and controlling the problem. Although the evidence is inconclusive that chiropractic care is beneficial in the treatment of infant colic, several studies document less crying time for infants treated by a chiropractor.^{23–28} Listening to the parents' concerns and reassurance that the child is healthy and thriving may also be useful, although not curative. Generally, the most effective help for the parents is from a supportive healthcare professional²⁹ and the chiropractor is in a position to provide that support.

Examination

This serves to determine the general health of the infant as well as specific sources of irritation. Although organic cause of excessive crying is rare (<5% of cases),³⁰ illness must be ruled out. The infant's growth chart is an important key to the child's health and should show normal increases over time. Vital signs differ significantly from adults and need to be checked carefully as these may be the only early sign (other than irritability) that a child has a serious disorder such as meningitis. Table 5 lists signs of illness in infants. If there are any concerns that the child is not in good health, referral to the child's GP, paediatrician or hospital (if urgent) is required.

Differential diagnosis

A single aetiology for infant crying is unknown^{7,29,30,31} and unlikely.⁷ Even though painful

Table 5 Signs of illness in an infant which require referral

Lethargy	A child too weak or disinterested to interact, too weak to cry, floppy, disinterested should be referred
High respiratory rate	Rapid or difficult respirations not related to activity is a serious sign; watch for respiration rate >60 breaths/minute, rib retractions; meningitis may have no other early sign
Blue lips or tongue	This may indicate a reduced amount of oxygen in the bloodstream
Dehydration	This commonly follows diarrhoea or vomiting. Look for dry mouth, sunken fontanelle, tenting skin, fewer than four wet nappies/day
Pain and tenderness	If child screams in pain when touched or being moved; if child doesn't want to be held because of pain; sudden onset of groin pain in a boy may be a sign of testicle torsion; episodic screaming pain may be a sign of intussusception
Tender abdomen	A child should well tolerate 2 cm abdominal impression; check for bloated or rigid abdomen
Projectile vomiting	Immediately following a feed and accompanied by golf-ball peristalsis may indicate pyloric stenosis
Bulging fontanelle	The anterior fontanelle (soft spot) will normal stiffen with crying; however, if there is evident bulge and rigidity in a quiet child in an upright position, this may be a sign of hydrocephalus
White tongue, red rash	Rash that desquamates and forms pustules may be a sign of systemic candidiasis
Purple spots	Purple or blood-red spots on the skin that do not blanch with pressure may be a sign of bloodstream infection. Exclude bruises that have an explanation
High fever	Neonates cannot tolerate a high fever. Meningitis may have no other early sign
Drooling	Excess drooling with a sudden onset, associated with difficult swallowing, may be a sign of epiglottitis or tonsillar infections
Growth chart	Healthy child will demonstrate increases over time. A child with a chart that depicts crossing to lower centiles that cannot be explained with family correlation or a child who loses >5% of their weight needs to be referred
Rashes	Non-blanching skin spots requires referral. A nappy rash may cause great discomfort and may need to be treated medically

crying cannot be legitimately included under the term "colic," gastro-intestinal disorders must be considered. Many causes have been implicated, such as gastro-oesophageal reflux³² and cow's milk protein intolerance,³³ as well as an individual infant's sensitivity to normal body processes such as digestion and/or difficulty in self-regulation and disturbance of the autonomic nervous system (ANS).³⁴ A common finding is musculoskeletal disturbance secondary to intra-uterine constraint and/or birth trauma.^{35–43} Table 6 shows the most common differential diagnoses of excessive infant crying and specific symptoms associated with each. Musculoskeletal conditions such as irritable infant syndrome of musculoskeletal origin (IISMO)⁴⁴ and kinematic imbalance due to suboccipital strain (KISS), which has been described as torticollis with fixed cervical retroflexion,⁴⁵ may be identified by observation of physical signs as well (Figs. 2 and 3).

Rationale for chiropractic care

Chiropractic treatment is primarily aimed at correcting biomechanical and musculoskeletal fault. There is increasing evidence that ante-natal and natal factors significantly contribute to musculoskeletal irritability in infants.^{46,47} The influence of ante-natal confining intra-uterine pressures and/or compressive and tractional forces of birth (such as the occasionally necessary use of forceps and/or vacuum extraction) may have long-term effects on the neonate. Pelvic obliquity, rib cage moulding, hip dysplasia, torticollis, postural scoliosis and asymmetry and plagiocephaly as well as cranial and clavicle fractures are regularly encountered in the neonate^{35,37,44,48} In addition, it is possible that many infants may suffer from mechanical strains and soft tissue injuries less profound and perhaps less obvious than those already listed. Intra-uterine (I-U) constraint is most common in first

Table 6 Common differential diagnoses of the excessively crying infant

Characteristics	IISMO ^a	GOR ^b	CMPI ^c
Crying patterns	Excess crying any time of the day, generally increasing in the evening	Irritability and crying often within a few minutes after feed has begun (may be due to heartburn and acid reflux/abdominal pain)	Increased crying after feeds
Postures, movements, positional preferences	Antalgic posture held for the sake of comfort; asymmetric movements/activities; unilateral spinal hypertonicity; tactile defensive; spinal sensitivity in specific areas	Prefers to sit upright (not slumped); dislikes prone position; mild arching related to feeding	None
Eating behaviours	Mild feeding disturbance common; may be related to suck dysfunction	Frequent, recurrent vomiting, regurgitation; re-swallowing; may bite lip, show acid burns on lip; retching, choking, frequent cough; tongue thrusting nipple or pacifier; occasional diaphoresis while feeding	Feeding intolerance; increased hiccups; increased wind; vomiting common
Digestive disturbance	None or unrelated	Occasional haem-positive stools or emesis; occasional failure to thrive	Occult blood in stool; occasional diarrhoea
Other signs, symptoms, timing of disorder	Restless sleep or may refuse to sleep supine; affective disorder common; condition does not tend to improve over time, but may change as infant gains more strength and control, distress may change to "control" behaviours, such as head banging	Persistence after 12 weeks, resolves by 1 year; diagnosed most often with history. Tests are barium swallow, pH probe, upper GI endoscopy or gastric emptying studies (usually unnecessary). Rarely responds to medication under 2 years of age	Disturbed sleep; rhinitis, eczema, may show later asthma; negative RAST tests and normal IgE; remission with change to pre-hydrolyzed formula or restriction of cow's milk protein in mother's diet; signs recur with re-introduction of CMP into infant's diet

^a Irritable infant syndrome of musculoskeletal origin.

^b Gastro-oesophageal reflux.

^c Cow's milk protein intolerance.



Figure 2 Antalgic posture of infant with irritable infant syndrome of musculoskeletal origin (IISMO).



Figure 3 Fixed head retroflexion in kinematic imbalance due to suboccipital strain (KISS).

born, infants born to mothers with small abdominal circumference and those born to mothers who had their first child at an older than average age.⁴³ All of these risks point to increased tone in the abdominal and uterine wall and a restriction in space with possible compromise to movement of the foetus. Frequency of change of position in-utero (I-U) has been shown to occur significantly less in this group of mothers and could possibly contribute to deformation of the foetus.³⁷ Deformation with extraction by force with forceps or ventouse suction or being tugged out against gravity in an emergency caesarian section have also been associated with birth trauma involving the musculoskeletal system.^{38,39}

These infants often show postural preferences or even antalgic posture to attain a position of comfort secondary to the strains of I-U life and birth trauma (Fig. 2). This is labelled Irritable Infant Syndrome of Musculoskeletal Origin (IISMO) to reflect the complex behaviours of the child as well as an identifiable aetiology. Recognition of musculoskeletal lesions falls squarely within the expertise and competence of the chiropractor who is ideally placed for the detection and management of KISS, IISMO, torticollis and other biomechanical asymmetries. These are best treated early to take advantage of cerebral plasticity and pruning, and before the deformity has consolidated in fixed motor behaviour with full (aberrant) adaptation.^{49–55} It seems as though the musculoskeletal disturbance which plagues adults may begin in infancy. Even infants with less obvious musculoskeletal dysfunction may suffer from hyper-irritability (known as dysregulation).^{56–61} As in adults, the correction of spinal imbalances in these infants may have the effect of decreasing the irritability, creating less disruption in the ANS and in infants, less “dysregulation,” all of which can result in decreasing crying times and improved sleep.

Plan of management

If the differential diagnosis suggests gastro-oesophageal reflux (GOR), conservative management can be recommended by the chiropractor. Advice to the parent can consist of the following:

- upright positioning after feeding
- elevating the head-end of the baby’s cot
- thickening agents for feeds
- smaller, more frequent meals
- no bouncing after meals
- reassure that this is a physiological condition due to an immature digestive system and that the child’s system will develop by the time they are 1-year-old. GOR is a rare single cause of irritability.⁶²

If cow’s milk protein intolerance (CMPI) is suspected, advice to the parent on removal of bovine dairy products from the mother’s diet (if breastfeeding) or switching to a pre-hydrolyzed non-allergenic formula is recommended.³³ A trial of five to seven days will be sufficient to notice major changes in the infant’s behaviour. The appropriate therapy is to change the infant’s feed and this will often result in resolution of symptoms. It is important to remember that CMPI is rare, with a prevalence of only 2–3%.³³

If no referable pathology or illnesses have been detected, it is appropriate to treat the child’s musculoskeletal dysfunctions with a therapeutic trial of manual therapy. A plan of management based on two treatments of modified manual therapy per week for two weeks should demonstrate significant reduction in crying times and improved posture and comfort for the child. Complete honesty with the parent is essential. You may wish to say “I have clinical reason to believe that this care will help your child, but there is no definitive evidence to say this with complete certainty.” In our clinical experience, infants with simple biomechanical disturbance will show improvement, on average, after one treatment and will become noticeably and significantly improved (as reported by the parents) after three treatments. The more profound musculoskeletal disturbances may require a greater number of treatments to achieve postural stability; in our experience, this can take up to a dozen treatments.

Conclusion

The excessively crying infant is a common presentation to the chiropractor. The chiropractor as a primary healthcare provider is able to differentially diagnose the problem and if required restore normal biomechanics and musculoskeletal balance, resulting in comfort for the infant and respite for the parent.

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