

LOCAL PRACTICES OF INFANTILE COLIC MANAGEMENT AND HEALTH OUTCOMES IN CHILDREN: A SCOPING REVIEW

T. D. Odetola, RN, PhD

<http://orcid.org/0000-0002-3363-8073>

University of Ibadan, Nigeria

odetolatitilayo@yahoo.com

M. O. Abiona, BNSc

<http://orcid.org/0000-0002-0047-2652>

Ondo State School of Nursing, Nigeria

dcnsabiona@gmail.com

ABSTRACT

Infantile colic is a self-limiting condition that occurs in infants. It is a common disturbance occurring in the first three months of life but is generally harmless. The exact aetiology is unknown, but it is associated with a vicious cycle of the infant crying and swallowing of air. Mothers use a number of methods to relieve their infants from this condition. However, there is limited evidence that support the use of complementary and alternative treatments (such as herbal supplements, and a manipulative approach) or behavioural interventions. The impetus of this paper is thus to explore local or alternative methods of the management of infantile colic. A scoping review of existing literature was done to assess all research on local practices of infantile colic management by nurses and doctors in developed countries and work carried out in Africa. This was done to identify what has been done and to identify any gaps in research. The majority of the studies reviewed revealed positive effects of unorthodox or local methods in managing infantile colic although some cause complications for the infants. There are very few published articles on this subject and methods used. The researchers, therefore, recommend more controlled trials to test the effectiveness of the different local substances used to manage infantile colic.

Keywords: infantile colic; local practice; management; health outcome



BACKGROUND OF THE STUDY

Infantile colic is a syndrome characterised by excessive, unexplained paroxysmal crying in an otherwise healthy baby (Savino 2007). The crying typically starts in the first few weeks of life and spontaneously resolves within three to five months (Landgren, Lundqvist, and Hallström 2012). Excessive crying is defined as crying that lasts for more than three hours per day and more than three days per week for at least three weeks (Leung and Lemay 2004). The crying has been typically described as a high-pitched scream, occurring mainly in the late afternoon or evening, but may occur at any time. Characteristically, the infants' knees are drawn up to the abdomen, the face is flushed and "pained", the fists are clenched, the flatus is expelled, and there is minimal response to attempts at soothing the infant (Balon 1997).

Various studies have attributed colic to painful intestinal contractions, lactose intolerance, the presence of gas in the gut, and parental misinterpretation of normal crying. However, in recent times, it was hypothesised from various studies that infantile colic might have a medical or behavioural cause (Savino 2007). The medical hypotheses include food hypersensitivity or allergies and immaturity of gut function or gut dysmotility. The behavioural hypotheses include inadequate maternal-infant interaction (Lucassen et al. 1998), maternal anxiety and difficult infant temperament (Leung and Lemay 2004). Other recent hypotheses that are being investigated are hormone alterations and maternal smoking (Savino 2007). The role of gut microflora in the aetiopathogenesis of colic has also been reported. The linking of colic to organic causes has changed its management interventions which include the use of a wider range of pharmacological agents such as antispasmodic, defoaming agents, gut hormone antagonists (Savino 2007), and herbal medicines (Oshikoya, Senbanjo, and Njokanma 2009).

Both behavioural and pharmacological interventions have been studied over the years in the management of colic and have demonstrated a significant improvement in the symptoms (Arikan et al. 2008). However, only a few of these interventions have been confirmed by randomised clinical trials. Infantile colic usually has a favourable course and outcome, even without treatment. Most infants are free of the symptoms by the age of four to five months (Savino 2007). However, most parents are faced with tremendous stress and are unlikely to tolerate the stress until the symptoms completely disappear without medical intervention; therefore either medical help is sought or self-medication practised by the parents (Arikan et al. 2008; Oshikoya, Senbanjo, and Njokanma 2009). The majority of Nigerians are known to use and consult traditional healers for healthcare because of poverty and poor enlightenment. Based on this, herbal medicines are commonly used in childhood illnesses and even in managing colic (Chinawa et al. 2013).

When a baby constantly cries despite the parents' attempts at consolation, the balance within the family is disturbed as all of the members of a family are mutually dependent in a complex system. Colic disturbs mother-child and father-child relationships (Landgren,

Lundqvist and Hallström 2012), creates chaos and disrupts family life (Landgren and Hallström 2011). Both mothers and fathers often feel powerless and frustrated and search desperately and creatively for treatments for colic to soothe their babies' crying. Parents become very frustrated when they find that no intervention seems to help. Therefore they try various means to soothe the baby (Landgren and Hallström 2011).

STATEMENT OF THE RESEARCH PROBLEM

Infantile colic is one of the major challenges of parenthood. It is the most common paediatric problem in the first year (Oshikoya, Senbanjo, and Njokanma 2009). It is also one of the common reasons why parents seek medical advice during their child's first three months of life. Sleepless nights and the inability to console a newly arrived baby cause a great deal of stress, especially among first-time parents.

Because of the lack of consensus in the literature about the aetiology and management of colic, healthcare providers do not have a consistent explanation or approach to management to share with distressed parents. This lack of consistency leads to confusion for the parents because they are unsure of whom to turn to or what advice to follow. In a bid to resolve the stress and anxiety posed by the condition in their infants, most mothers receive advice from friends and family which may conflict with the regimen prescribed by healthcare providers. These mothers also try various local and unorthodox regimens to help and relieve their babies of the colic.

PURPOSE OF THE STUDY

The purpose of the study was to review existing literature on researches conducted especially by medical doctors and nurses in local practices of infantile colic management both in developed countries and in Africa. This review is done to identify local methods that mothers or caregivers follow to manage their infants with colic.

This study will help in identifying gaps in existing literature on infantile colic management and will add to the body of knowledge on effective methods of managing infantile colic.

OBJECTIVES OF THE STUDY

- To investigate local methods of managing infantile colic.
- To explore the effectiveness of local or unorthodox methods of managing infantile colic.
- To identify gaps in existing literature on infantile colic management.

METHODS

Study Design

The researchers conducted a scoping review of existing literature to assess all research conducted in Africa, West Africa and globally on local practices of infantile colic management from 2005 to 2015. The researchers wanted to identify what research has been done, which ones were adjudged effective, where they have been done, and to identify any gaps in infantile colic management research.

Search Strategy

Systematic searches of literature on local practices of infantile colic management among mothers published in peer-reviewed journals from 1 January 2005 to 31 December 2015 were performed in PubMed, Web of Science, CINAHL, and Science Direct. Studies were identified using keyword searches of electronic databases.

Inclusion and Exclusion Criteria

- Research was included if it was conducted by doctors and nurses.
- The study had to contain original research excluding reviews and letters to the editors.
- Articles had to be published globally in any peer-reviewed journal with an abstract in English, and had to include patient outcomes.
- Articles had to be published from 2005–2015.

Procedure for Article Selection

The procedure for selecting articles was sequential consisting of the identification of relevant literature, screening of the articles, assessing the eligibility of full texts, and final inclusion of articles. Studies were retrieved from the initial search, and full articles were downloaded. This process resulted in seven articles that met the criteria being selected and used for the study.

Data Extraction

Data were extracted from studies that met the inclusion criteria using the researcher-developed extraction sheet created for the study. The data included the names of the authors, the title of the study, year of publication, countries of publication and study, and study type and design.

RESULTS

Different studies have shown the effectiveness of unorthodox techniques and methods of managing babies with colic. The studies ranged from descriptive studies to interventional studies. The different methods of the management of infantile colic are discussed below.

Herbal Extracts

A study was carried out by Savino et al. (2005) to test the effectiveness of a standardised extract of *Matricaria recutita* (chamomile), *Foeniculum vulgare* (fennel) and *Melissa officinalis* (lemon balm) (Colimil) in the treatment of breastfed colicky infants. Ninety-three breastfed colicky infants were enrolled in the study; the diagnosis of infantile colic was made according to Wessel's criteria. After a three-day observation period, the infants were randomly divided into two groups, one treated with a phytotherapeutic agent (PA) and the other with placebo twice a day for one week. Crying time, and side effects were recorded. The study shows that colic in breastfed infants improves within one week of treatment with an extract based on *Matricaria recutita*, *Foeniculum vulgare* and *Melissa officinalis*.

Chashti (2008) also recommended giving the infants extracts from *Trachyspermum copticum*, and *Foeniculum vulgare* (fennel) mixed in the milk for the infant, which are also effective. Another effective possibility is mixing the extract from *Foeniculum vulgare* and *Acorus calamus* in the milk and giving it to the infant. Similar effects have been reported for *Pimpinella anisum* (aniseed) and mastic. In cases in which the aetiology is related to the warm nature of the food, the modification of the mother's diet and consequently the milk consumed by the infant are of importance. In such cases, it is recommended to give medications of "cold nature" to the infant. Giving the infant a massage with cold oils such as *Viola odorata* (sweet violet) (Feyzabadi et al. 2014), *Rosa damascena* (damask rose) or even giving the infant some drops of almond oil can also be effective (Chashti 2008).

Sucrose Solution, Herbal Tea or Hydrolysed Formulas

The effectiveness of massage, sucrose solution, herbal tea or a hydrolysed formula, each used individually in the treatment of infantile colic was evaluated by Arikan et al. (2008) using a randomised controlled trial. The study revealed that there was a significant reduction in the crying hours per day in all intervention groups. The difference between the mean duration of the total crying (hours/day) before and after the intervention in the infants in the hydrolysed formula group was higher than that of the massage, sucrose and herbal tea group. Similarly, the difference between the mean duration of the total crying (hours/day) before and after the intervention in the infants in the massage group was lower than that of the other intervention groups. Therefore, the study findings demonstrated that varied interventions such as administering a massage,

sucrose solution, herbal tea and hydrolysed formula are effective in the treatment of colic. However, the hydrolysed formula was the most effective in reducing the duration of crying (hours/day) when compared with the other intervention groups.

Massage or Chiropractic Interventions

Massage is another unorthodox method or local way of managing the colic condition. According to a study by Sheidaei et al. (2016), massage significantly improved colic symptoms during a one-week intervention for all outcomes. In addition, significant differences were found between the intervention and control groups for massaging. Therefore, massage therapy is more effective than rocking for treating infantile colic symptoms. This study also supports the findings of a study conducted by Javan, Feyzabadi, and Kiani (2015), which discovered that one of the most effective treatment methods for colic in infants is abdomen massage. Based on the study, *Trachyspermum copticum* (Ajowan caraway, bishop's weed or carom) mixed with yolk in diluted form (Tela) proved very helpful when massaging the infant abdomen. Oils from herbs such as mastic and olives also yielded positive results when used to massage infants. Another useful method explored by this interventional study is putting the infant on its mother's lap facing downwards and then massaging its spinal cord and back, using oil from *Rosa damascena*.

This chiropractic intervention was also discovered in Nigeria according to a study by Oshikoya, Senbanjo, and Njokanma (2009), in which infantile colic was managed by massaging the infants' abdomens with anointing oils or herbal mixtures. Mothers placing their hands on the abdomens of their colicky infants or laying the infants on their abdomens (56.4%) and applying a hot water bottle to the colicky abdomen (21.8%) were the other chiropractic interventions practised by the mothers. They also stipulated that applying a hot water bottle to the abdomen of the infant has been reported to relieve rectal spasm to aid easier passage of flatus. Parents must, however, be cautioned about the use of this method as they stand the risk of causing burn to the infants' abdomens.

Arikan et al. (2008) also conducted a study to test the effectiveness of massage as an intervention with other unorthodox substances in the management of infants with colic. The massage intervention yielded the least symptomatic improvement among all other interventions tested, but it was effective in soothing the irritable babies.

Herbal Concoctions

In Nigeria, herbal medicines are usually used to manage babies with colic. The use of herbal concoctions in the management of childhood illnesses has been reported both in developed and developing countries. According to a study by Chinawa et al. (2013), the most commonly used herbal concoction by caregivers is "Gbomoro". This is a herbal medication which contains mainly chloroquine, lactose and ascorbic acid (Oshikoya et al. 2007). It has been hypothesised that when given to infants with colic, it relieves them

of pain. Pharmacological and toxicological studies are necessary to determine the safety of this herbal medication in infants.

Gripe water has been in use for over a century to treat colic with little or no response. This may explain the 4.6 per cent of mothers who used it as self-medication. It has been determined that the alcohol content of gripe water provides a soothing effect, the bicarbonate provides a neutralising effect on the gastric acid, and the carminative in the plant extract causes the soothing of the infant in the presence of excess gas in the lumen that may cause pain. This treatment is, however, not entirely harmless. Therefore the proper dosage has to be scientifically determined (Chinawa et al. 2013).

Although the majority of mothers did not attribute the colic to any disease, they were willing to use herbal concoctions to treat the abdominal colic, as no caregiver is comfortable watching a child in pain and discomfort. The use of native concoctions for infants with colic may be viewed as a common practice among mothers of different cultures and tribes in Nigeria, but the types of herbal medicine used may likely differ. For instance, “Ororo Ogiri” was the most used herbal medicine in a particular study (Oshikoya, Senbanjo, and Njokanma 2009). It is derived from putrefied *Cucumeropsis mannii* (melon) seeds, and is used as a local food seasoning among the Yoruba tribe in Nigeria. When dissolved in water and taken by adults, it relieves indigestion by causing excessive flatulence. Its use in the treatment of infantile colic was based on the hypothesis that it removes the excess intraluminal gas in the infant by causing flatulence.

The majority of the mothers (87.7%) studied by Chinawa et al. (2013) apply various substances or medications for colic which range from paracetamol (33.1%), Gbomoro (16.2%), teething powder (15.4%), salt water (13.2%), Buscopan (7.7%) and gripe water (4.6%). Mothers usually attribute symptoms of most childhood illnesses to abdominal colic. This may have led to unnecessary and sometimes harmful management. The study by Oshikoya, Senbanjo, and Njokanma (2009) revealed various herbal substances used to manage babies with this condition of which 48 (26.2%) were “Ororo Ogiri”. Nospamin (49.5%) and gripe water (43.0%) were the two frequently prescribed and self-medicated medicines for infants with colic. However, the efficacy of these herbal drugs is yet to be evaluated.

However, various complications can arise from the use or excessive use of herbal concoctions. Hepatic encephalopathy and death from the use of herbal preparations (such as preparations from *Allium sativum* L. (garlic) and *Allium ascalonicum* L. (shallots)) that contain naphthalene tablets have been reported by some workers. Other documented harmful effects of these herbal preparations have also been reported (Chinawa et al. 2013).

Acupuncture

Some studies have shown that the practice of acupuncture had different effects on the treatment of infantile colic (Ernst 2009; Landgren, Lundqvist, and Hallström 2011).

Acupuncture is a frequently used alternative treatment modality in Scandinavia and is also used for infantile colic (Reinthal, Lund, and Lundeberg 2011). Acupuncture is an original Chinese treatment method using thin steel needles penetrating through the skin and into connective tissue and muscle fibres. The neurophysiologic basis for the observed effects, especially the pain-inhibiting effects, is relatively well understood. Acupuncture is a safe procedure when used by trained practitioners, and the risk of serious adverse effects is low in children (Adams et al. 2011).

Two controlled trials of children with infantile colic treated with acupuncture have been published (Landgren and Hallström 2011; Reinthal, Lund, and Lundeberg 2011). Both studies concluded that acupuncture significantly reduced the crying and pain-related behaviour without noticeable adverse effects. Effect sizes were small, and there was no blinding validation. General practitioners were educated within the programmes of the Norwegian Society of Medical Acupuncture and used a standardised bilateral needling of the point ST36 when treating infantile colic. Acupuncture point ST36 is located in the proximal part of the anterior tibia muscle and is the acupuncture point considered for ailments of gastro-intestinal nature in traditional Chinese medicine (Deadman, Al-Khafaji, and Baker 2008). A postulated neurophysiologic mechanism explains a beneficial effect on gut dysmotility by way of the parasympathetic vagal reflexes, as well as a centrally opioid-mediated pain inhibitory pathway (Takahashi 2006).

When Holgeir et al. (2013) carried out a study with the aim to test the hypothesis that such acupuncture treatment has an effect above no-treatment control in infantile colic, it was discovered that the trial of acupuncture treatment for infantile colic showed no statistically significant or clinically relevant effect.

CONCLUSION

Infantile colic affects newborns for up to three months. It is a self-limiting condition. Owing to the stress this condition causes parents or caregivers, the majority of the parents or caregivers try a variety of treatments ranging from pharmacological to non-pharmacological methods. These treatments all have an effect on the colicky infant. Local or herbal treatments had also proven to be effective in managing this condition, but the majority of these products or substances have yet to be studied to determine their efficacy and side effects in infants. It is therefore recommended that clinical trials be carried out on these products and unconventional ways of managing infantile colic.

ACKNOWLEDGEMENTS

The researchers wish to thank Kazeem Oshikoya, Idowu Senbajo and Olisamedua Njokanma for going the extra mile in investigating the local methods used by Nigerian mothers in managing infantile colic. The researchers also wish to thank the

mothers who participated in the study, the Medical Librarian, Dr J. U. Igbeka, from the Latunde Odeku Medical Library, and the College of Medicine at the University of Ibadan for granting permission to use their library portal.

REFERENCES

- Adams, D., F. Cheng, H. Jou, S. Aung, Y. Yasui, and S. Vohra. 2011. "The Safety of Pediatric Acupuncture: A Systematic Review." *Pediatrics* 128 (6): 1575–87. <https://doi.org/10.1542/peds.2011-1091>.
- Arikan, D., H. Alp, S. Gözümlü, Z. Orbak, and E. K. Cifçi. 2008. "Effectiveness of Massage, Sucrose Solution, Herbal Tea or Hydrolysed Formula in the Treatment of Infantile Colic." *Journal of Clinical Nursing* 17 (13): 1754–61. <https://doi.org/10.1111/j.1365-2702.2007.02093.x>.
- Balon, A.J. 1997. "Management of Infantile Colic." *American Family Physician* 55 (1): 235–42.
- Chasti, M. A. 2008. *Exir-e-Azam* [Great elixir]. Tehran: Research Institute for Islamic and Complementary Medicine.
- Chinawa, J. M., A. C. Ubesie, G. N. Adimora, H. A. Obu, and C. B. Eke. 2013. "Mothers' Perception and Management of Abdominal Colic in Infants in Enugu, Nigeria." *Nigerian Journal of Clinical Practice* 16 (2): 169–73. <https://doi.org/10.4103/1119-3077.110135>.
- Deadman, P., M. Al-Khafaji, and K. Baker. 2008. *A Manual of Acupuncture*. 3rd ed. Hove: Journal of Chinese Medicine.
- Ernst, E. 2009. "Chiropractic Spinal Manipulation for Infant Colic: A Systematic Review of Randomised Clinical Trials." *International Journal of Clinical Practice* 63 (9): 1351–53. <https://doi.org/10.1111/j.1742-1241.2009.02133.x>.
- Feyzabadi, Z., R. Javan, R. Mokaberinejad, J. Aliasl. 2014. "Comparing Insomnia Treatment in Iranian Traditional Medicine and Modern Medicine." *History of Medicine Journal* 6 (19): 185–208.
- Holgeir, S., S. Trygve, F. Arne, and B. Mettte. 2013. "Acupuncture for Infantile Colic: A Blinding-validated, Randomized Controlled Multicentre Trial in General Practice." *Scandinavian Journal of Primary Health Care* 31 (4): 190–6. <https://doi.org/10.3109/02813432.2013.862915>.
- Javan, R., Z. Feyzabadi, and M. Kiani. 2015. "Management of Infantile Colic; Based on Traditional Iranian Medicine." *International Journal of Pediatrics* 3 (5.1): 909–13. <https://doi.org/10.22038/IJP.2015.4749>.
- Landgren, K., and I. Hallström. 2011. "Parents' Experience of Living with a Baby with Infantile Colic –A Phenomenological Hermeneutic Study." *Scandinavian Journal of Caring Sciences* 25 (2): 317–24. <https://doi.org/10.1111/j.1471-6712.2010.00829.x>.
- Landgren, K., A. Lundqvist, and I. Hallström. 2012. "Remembering the Chaos – But Life Went on and the Wound Healed. A Four Year Follow Up with Parents having had a Baby with Infantile Colic." *Open Nursing Journal* 6: 53–61. <https://doi.org/10.2174/1874434601206010053>.
- Leung, A. K., and J. F. Lemay. 2004. "Infantile Colic: A Review." *Journal of the Royal Society for the Promotion of Health* 124 (4): 162–6. <https://doi.org/10.1177/146642400412400407>.

- Lucassen, P. L. B. J., W. J. J. Assendelft, J. W. Gubbels, J. T. M. van Eijk, W. J. van Geldrop, and A. K. Neven. 1998. "Effectiveness of Treatments for Infantile Colic: Systematic Review." *BMJ* 316: 1563–69. <https://doi.org/10.1136/bmj.316.7144.1563>.
- Oshikoya, K., O. F. Njokanma, H. A. Chukwura, and I. O. Ojo. 2007. "Adverse Drug Reactions in Nigerian Children." *Paediatric and Perinatal Drug Therapy* 8: 81–88. <https://doi.org/10.1185/146300907X199858>.
- Oshikoya, K. A., I. O. Senbanjo, and O. F. Njokanma. 2009. "Self-medication for Infants with Colic in Lagos, Nigeria." *BMC Pediatrics* 9: 9. <https://doi.org/10.1186/1471-2431-9-9>.
- Reinthal, M., I. Lund, and T. Lundeberg. 2011. "Infantile Colic: More than the Mother." *Acupuncture in Medicine* 29 (4): 246. <https://doi.org/10.1136/acupmed-2011-010096>.
- Savino, F. 2007. "Focus on Infantile Colic." *Acta Paediatrica* 96 (9): 1259–64. <https://doi.org/10.1111/j.1651-2227.2007.00428.x>.
- Savino, F., F. Cresi, E. Castagno, L. Silvestro, and R. Oggero. 2005. "A Randomized Double-Blind Placebo-Controlled Trial of a Standardized Extract of *Matricariae Recutita*, *Foeniculum Vulgare* and *Melissa Officinalis* (ColiMil) in the Treatment of Breastfed Colicky Infants." *Phytotherapy Research* 19 (4): 335–40. <https://doi.org/10.1002/ptr.1668>.
- Sheidaei, A., A. Abadi, F. Zayeri, F. Nahidi, N. Gazerani, and A. Mansouri. 2016. "The Effectiveness of Massage Therapy in the Treatment of Infantile Colic Symptoms: A Randomized Controlled Trial." *Medical Journal of the Islamic Republic of Iran* 30: 351.
- Takahashi, T. 2006. "Acupuncture for Functional Gastrointestinal Disorders." *Journal of Gastroenterology* 41 (5): 408–17. <https://doi.org/10.1007/s00535-006-1773-6>.