



Acupuncture in the treatment of infantile colic: a systematic review

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ABSTRACT

Introduction: The prevalence of infantile colic is high, but there is no safe and effective conventional treatment. Acupuncture is a Chinese method of complementary medicine, and its therapeutic effects have been investigated in colic pain, crying out, fecal excretion, anxiety, relaxation and sleep duration. The use of acupuncture in infantile colic has increased despite weak evidence. The aim of this paper was to review the literature about safety and efficiency of acupuncture in infantile colic.

Methods: Medline, Embase, Cochrane Central, and Scopus were searched with keywords "infantile colic", and "acupuncture", and a manual search of references was also performed in articles. Randomized controlled trial (RCT) and case reports were included in this review.

Results: Seven of the 36 studies evaluated the effects of acupuncture in infantile colic. Five RCT, one case reports and one personal communication with acupuncturists were evaluated in our study.

Conclusion: Several studies have investigated the effects of acupuncture in infantile colic and found beneficial results. We found evidences of some efficacy and low risk associated with acupuncture in pediatrics. To improve further acupuncture therapy, further research is required to investigate the effects of acupuncture on infantile colic by using experimental and control groups.

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Introduction

Infantile colic is a common disorder in pediatrics around the world, and almost one in five children experienced colic in the first three months of life. Infantile colic is expressed as excessive crying in a healthy neonate and unpleasant feeling of both children and parents. Despite the high prevalence and importance, research in this field is limited and the cause of infantile colic is unknown, But there are hypotheses on the pathophysiology of infantile colic such as immaturity of nervous/digestive system, Cow's milk proteins allergy and

atopy, altered gut microflora, gut hormones, and some factors that may affect including family tension, maternal smoking, increased maternal age, firstborn status, and sleep disorders. The clinical diagnosis is based on signs and symptoms and physical examination. The main purpose of examination and evaluation is to rule out other underlying causes of disorder. Common programs in treatment of infantile colic are assurance, education, modified food, medicines, behavioral interventions and reduced stimulation of the infant,

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but other approaches such as complementary and alternative medicine (CAM) may also be used (1,2).

CAM is a group of various medical and health care systems, practices, and traditional preparations that is not currently considered to be part of conventional medicine. The uses of CAM for example, massage, herbal medicine, and acupuncture together with conventional medicine has recently increased. World Health Organization estimates that most of the world's population regularly uses "traditional medicine" such as traditional Chinese medicine (TCM), and Ayurveda medicine. Acupuncture as a major component of TCM describes a family of procedures involving stimulation of anatomic points on the body by a variety of techniques. The acupuncture method that has been most studied scientifically involves penetrating the skin with thin, solid, metallic needles that are manipulated by hand or by electrical stimulation. The use of acupuncture in the treatment of children's diseases, especially chronic cases is growing. Acupuncture is safe when used by physicians who are educated and have sufficient knowledge in this area (2-4).

We already in a short review article reported that acupuncture has been widely used in children's diseases, especially pediatric digestive diseases (5). Savino et al (2014), in literature review on the treatment of infantile colic has noted that acupuncture is a complementary or alternative treatment for infantile colic, but it requires careful assessment of the indications of acupuncture in pediatric colic, especially in cases where the response to conventional treatment is difficult. This paper performs an overview on the use of acupuncture to define a new picture of current literature in order to propose an evidence-based practical approach for the treatment of infantile colic (6).

Methods

Searched databases

To review the literature, Google Scholar, PubMed, Embase, Cochrane library, Scopus and Iranian databases including SID, and Magiran were searched based on the PRISMA guidelines using the following search terms (acupuncture AND infantile colic OR baby colic) (acupuncture AND pediatric disease), and (infantile colic OR baby colic AND Complementary and Alternative Medicine (CAM)). The search was performed during 2000-2015. The references listed were also manually checked to find other potentially eligible documents. Out of 36 records found in the electronic databases, 7 related studies were included for final analysis (Figure 1).

Inclusion and exclusion criteria

Randomized controlled trial (RCT) and case reports in Persian, and English language that labeled the intervention "acupuncture and infantile colic" was inclusion criteria. We excluded review articles, animal study and study with weak in methodology. Titles and abstracts identified from the initial search were studied and unrelated articles were excluded. Articles involving low number of patients, published before 2000, non-English articles, and those that described patients with diseases such as malnutrition and allergy were excluded from this study. All papers were evaluated for inclusion criteria of the study. Main outcomes that were extracted in each article included the number of patients, duration of treatment, number of sessions, and points that used the needling.

Quality assessment

Analysis of data and quality evaluation of the literature were performed independently by two investigators. Two investigators read the titles, abstracts, full texts and made final decisions on study inclusion and proceeding to data collection. For methodological quality evaluation of RCT, the Cochrane Collaboration tool was used.

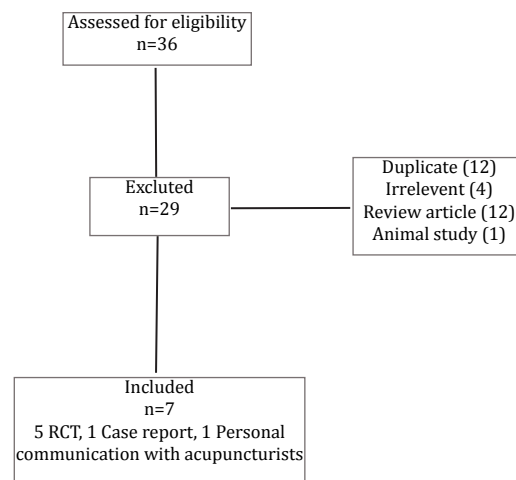


Figure 1. Flowchart study.

Results

Overall, we reviewed 36 different published journal articles including 5 RCT, one case reports and one personal communication with acupuncturists. Thus, 7 articles were included. A general overview of the studies that were included in this research is summarized in Table 1 in the chronological order of their publication date. The population size in article ranged from 40 to 913 patients, and the treatment duration varied from 1 to 3 weeks in studies. The dates of the literature ranged from 2000 to 2015, indicating that little information may be available on the subject.

Table 1. Study on acupuncture for infantile colic.

| Author Year Reference | Study design | Acupuncture point | No. of subjects | Treatment duration | Results |
|-----------------------------|--------------|-------------------|-----------------|-----------------------|-------------------------------|
| Skjeie H 2013 (14) | RCT* | ST36** | 84 | 3 days | No significant differences |
| Reinthal M 2011 (16) | case series | LI4*** | 913 | 1 weeks | Effective |
| Landgren K 2010 (11) | RCT | LI4 | 90 | 3 weeks | Effective |
| Reinthal M 2008 (10) | RCT | LI4 | 40 | 2 weeks | Effective |
| Landgren K 2015 (13) | RCT | LI4 | 144 | 2 weeks | Effective |
| Landgren K 2011 (8) | RCT | LI4 | 81 | 2 weeks | No significant differences |

*RCT: Randomized Clinical Trial, ST36: stomach 36, LI4: Large intestine 4.

Discussion

One of the therapeutic methods of TCM is acupuncture. The World Health Organization has accepted acupuncture in the treatment of some diseases (i.e. fever, upper respiratory infections, ear infections, acute wheezing, allergies, headaches, gastroenteritis)(5). Colic is a common disease in infancy with unknown etiology. Several therapeutic methods have been introduced to control infantile colic symptoms.

We identified and reviewed 7 articles that evaluated the usefulness of acupuncture for the treatment of infantile colic symptoms. Overall, a comparison between the studies showed that acupuncture was effective in infantile colic. Savino et al (2014) in a review paper described all current therapeutic approaches including acupuncture for treatments of infantile colic (6). Similarly, an initial pilot study reported positive effect of acupuncture in the "Sifeng" and 'PC7" points in 13 night crying baby (7). Landgren et al (2015) in a "letter to the editor" stated that acupuncture can reduce the pain and anxiety, and it appears to be a safe treatment in infantile colic; however, this procedure should be performed by a trained acupuncturist (8).

Adams et al (2011) in a systematic review evaluated adverse events associated with needle acupuncture in children. They reported that most of the serious adverse events may have been due to non-standard methods. However, results from adult studies, support that acupuncture is safe when performed by trained physicians (9).

Reinthal et al. (2008) in a prospective, quasi-randomized single blind controlled trial, with 40 patients used pre- and post- acupuncture test to

assess intensity, frequency, and duration of crying and pain. Children were given light needling acupuncture on one point (LI4) on both hands for approximately 20 seconds on four occasions, or received the same care except needling. They showed that treatments with light needling on one point in the hand may alleviate crying and pain related behavior without any noted side effects. The difference between the groups was significant (10).

In a randomized, controlled, blind clinical study (2010), 90 patients received standardized acupuncture for 2 seconds in LI4, 6 times during 3 weeks. Landgren et al. showed that minimal acupuncture reduced the duration and intensity of crying in infants with colic (11). In a study evaluating the effects of ST 36 acupuncture for infantile colic, it was shown that this procedure was effective in patients (12). In another RCT study by Landgren et al. (2011), 40 patients were given minimal acupuncture for two seconds in LI4. Parents reported a normalized stooling and significant improvement in the acupuncture group than in the control group (13).

In a similar study by Skjeie et al. (2013) in a blinding-validated, RCT with 84 patients, unilateral needling was used for two seconds at acupuncture point ST36 (Stomach 36), and the results showed no statistically significant or clinically relevant effect between the two (case and control) groups (14). Landgren K (2013) in a study based on interviews with 24 acupuncturists specialize in pediatric acupuncture showed that acupuncture is used for colic in at least nine countries and described current clinical practices such as needle

point selection and details. The points used most often were LI4, and ST36. The results of this study demonstrated that use of acupuncture for infantile in Chinese medicine is diversity. Since the data are limited, further research is needed to optimize the effects of acupuncture and to protect infants from unnecessary or less effective acupuncture (15).

In a case series by Reinthal et al. (2011) with 913 newborn infants with normal weights and lengths at birth, who had colic symptoms since two weeks after birth, the effects of acupuncture was investigated on infantile colic, and the results showed that minimal acupuncture at LI4 in infantile colic is an effective and easy treatment procedure without serious side effects (16). Landgren et al. (2015) in a randomized controlled trial of minimal acupuncture, with 114 patients, aged 2-9 weeks old, performed standardized minimal acupuncture in LI4 for 2 weeks. The study provided information about the efficacy and safety of acupuncture as a complement to usual care in infants with colic (13). In the above literature review, acupuncture in infantile colic has shown acceptable results. For this purpose, the large intestine 4 (LI4) or the stomach 36 (ST36) have also been used as acupuncture points (12).

The use of acupuncture has been shown to effectively treat many types of conditions. Mechanism of the acupuncture effect in infantile colic is not clear, but according to a hypothesis, needle may have a modulatory effect in sympathetic and parasympathetic systems, and neurochemical humoral mechanism may also be involved. Needling at LI4 and ST36 maybe reduces the level of stress hormones or disturbs equilibrium between the two parts of the autonomic system. Another mechanism has been suggested that acupuncture influences melatonin and serotonin secretion in circadian rhythms that may eliminate infant colic. Psychologically, acupuncture can also have a placebo effect. Acupuncture controls pain in the peripheral segmented and central levels (10,11,17-22). On the other hand, the etiology of infantile colic is not clear. So, to clarify the mechanism of acupuncture in this disease, basic research and clinical evaluation is needed.

The study has limitations. Although the search strategy was appropriate, some clinical trials may not be detected. Other limitations are poor quality of the primary studies, which were excluded during data processing, so these restrictions may not weaken our study.

Conclusion

Acupuncture originated in China and soon spread to elsewhere in the world. Acupuncture is widely used in health care systems. Many

studies have assessed the effect of acupuncture in the management of infantile colic, and have reported beneficial results. Our study showed that acupuncture has no serious side effects in children if performed by a person specialized for this technique. Acupuncture is effective in controlling the clinical symptoms of infantile colic. This study can increase our knowledge about the safety and effectiveness of acupuncture in children. In order to improve researches in the field of acupuncture, studies on the effects of acupuncture in infantile colic with larger sample size using the experimental and control groups (placebo/acupuncture) is needed.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Savino F, Garro M, Nicoli S, et al. Infantile colic: looking to old data through new eyes. *J Pediatr Neonat Individual Med.* 2015;4:e040230.
2. National Institutes of Health. National Center for Complementary and Alternative Medicine Web site. Available at: <http://nccam.nih.gov>. Accessed November 29, 2006.
3. Noras MR, Yousefi M, Kiani MA. Complementary and alternative medicine (CAM) Use in pediatric disease: a short review. *Int J Pediatr.* 2013; 1:45-49.
4. Adams D, Cheng F, Jou H, et al. The safety of pediatric acupuncture: a systematic review. *Pediatrics.* 2011;128:e1575-1587.
5. Bahrami HR, Noras M, Saeidi M. Acupuncture Use in Pediatric Disease: A Short Review. *International Journal of Pediatrics.* 2014; 2:69-72.
6. Savino F, Ceratto S, De Marco A, ET AL. Looking for new treatments of Infantile Colic. *Ital J Pediatr.* 2014;40:53.
7. Liu HR. Night crying in infants treated by acupuncture. *J Chin Med.* 1994;46:38.
8. Landgren K, Raith W, Schmölder GM. Acupuncture in the treatment of infantile colic. *Ital J Pediatr.* 2015;41:1.
9. Adams D, Cheng F, Jou H, et al. The safety of pediatric acupuncture: a systematic review. *Pediatrics.* 2011;128:e1575-1787.
10. Reinthal M, Andersson S, Gustafsson M, et al. Effects of minimal acupuncture in children with infantile colic—a prospective, quasi-randomised single blind controlled trial. *Acupunct Med.* 2008;26:171-182.
11. Landgren K, Kvorning N, Hallström I. Acupuncture reduces crying in infants with infantile colic: a randomised, controlled, blind clinical study. *Acupunct Med.* 2010;28:174-179.
12. Skjeie H, Skonnord T, Fetveit A, et al. A pilot study of ST36 acupuncture for infantile colic. *Acupunct Med.* 2011;29:103-107.
13. Landgren K, Kvorning N, Hallström I. Feeding, stooling and sleeping patterns in infants with colic—a randomized controlled trial of minimal acupuncture. *BMC Complement Altern Med.* 2011;11:93.
14. Skjeie H, Skonnord T, Fetveit A, et al. Acupuncture for infantile colic: a blinding-validated, randomized controlled multicentre trial in general practice. *Scand J Prim Health Care.* 2013;31:190-196.
15. Landgren K. Acupuncture in practice: investigating acupuncturists' approach to treating infantile colic. *Evid Based Complement Alternat Med.* 2013;2013:456712.
16. Reinthal M, Lund I, Ullman D, et al. Gastrointestinal symptoms of infantile colic and their change after light needling of acupuncture: a case series study of 913 infants. *Chin Med.* 2011;6:28.
17. Raith W, Urlesberger B, Schmölder GM. Efficacy and safety of

- acupuncture in preterm and term infants. *Evid Based Complement Alternat Med.* 2013;2013:739414.
18. Tabosa A, Yamamura Y, Forno ER, et al. Effect of the acupoints ST-36 (Zusanli) and SP-6 (Sanyinjiao) on intestinal myoelectric activity of Wistar rats. *Braz J Med Biol Res.* 2002;35:731-739.
 19. Lewith GT, Kenyon JN. Physiological and psychological explanations for the mechanism of acupuncture as a treatment for chronic pain. *Soc Sci Med.* 1984;19:1367-1378.
 20. Haker E, Egekvist H, Bjerring P. Effect of sensory stimulation (acupuncture) on sympathetic and parasympathetic activities in healthy subjects. *J Auton Nerv Syst.* 2000;79:52-59.
 21. Ezzo J, Berman B, Hadhazy VA, et al. Is acupuncture effective for the treatment of chronic pain? A systematic review. *Forsch Komplementarmed Klass Naturheilkd.* 2000;7:249-251.
 22. Zhao ZQ. Neural mechanism underlying acupuncture analgesia. *Prog Neurobiol.* 2008;85:355-375.