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Effect of Foot Reflexotherapy in Babies with Fuss-Cry-Irritability, Abdominal Bloating, Distension and Sleep Disorder Syndrome

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ABSTRACT

Introduction: Fuss-cry-irritable infant syndrome (infantile colic) is a distressing condition or an unsettled infant behavior resulting to excessive crying or fuss, which is considered by parents as problematic in the first few months of life. Infantile colic is associated with parenting stress, postnatal anxiety, depression, reduced mother well-being and early weaning from breast milk, as well as subsequent child behavioral problems. However, less attention has been given to this distressing and prevalent condition. Recent pharmacological investigations on infantile colic have shown contradicting results and drug side effects. Evidences indicate that complementary or integrative approach may be beneficial in infantile colic. The purpose of this study was to present the effects of foot reflexotherapy in babies with abdominal gas pain and distension.

Material and Methods: The subjects of the present study were seven babies diagnosed with infantile colic, abdominal bloating, distension and sleep disorder syndrome. Pre and post-tests were completed by the researcher using a Likert scale. The babies were treated with foot reflexotherapy twice each day for two weeks.

Results: There was statistically significant decrease in all colic scores: Paroxysms of fusing, agitation or crying, back arching, lifting of legs, abdominal swelling, abdominal tenderness, and sleep deprivation after foot reflexotherapy.

Conclusion: Foot reflexotherapy was beneficial and remarkably effective in babies with abdominal pain due to gas and distension.

Key words: Abdominal bloating, Abdominal distension, Baby, Foot reflexotherapy, Fuss-crying, Infant, Sleep disorder

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INTRODUCTION

Infant distress or unsettled behavior resulting to excessive crying or fuss, which is considered by parents as problematic in the first few months of life is generally termed fuss-cry-irritable infant syndrome (FCIS), also known as infantile colic [1,2]. FCIS is the most common concern of parents, occurring with a prevalence of 10–25% in all infants born during the first year of life [3]. Though self-limiting, FCIS is complex and usually a transitory developmental phenomenon, but may be due to several causes including breastfeeding problems, postnatal anxiety and depression [1,2,4], dysfunctional sensorimotor integration [1], musculoskeletal problems [5], gastrointestinal disorders [5,6] such as milk allergy and lactose intolerance [1,2], and child abuse [2]. These problems may be associated with sleep problems in infants [7] and parents [8]. Of the 483 infants in Melbourne, Australia, Wake et al. reported sleep disorders in 21%, 16%, 10%, and 12% of infants at 8, 12, 18, and 24 months of age, respectively [4]. Cook et al. observed that FCIS co-exists with sleep problems in 30% of cases [8]. Although FCIS may decrease with age, cases associated with organic problems require medical attention [4]. However, more recently some methods and approaches for addressing FCIS in infants have been recommended due to the negative consequences of persistent fuss-crying on the child, mother, and family as a whole [8–11].

FCIS triggers parenting stress, postnatal anxiety, and depression, which ultimately culminate in decreased well-being of parents and reduced

quality of caregiving [8–10,12]. Parents undergoing such problems have reduced sensitivity and may respond inadequately to their infant needs, which may further worsen the well-being of the baby [12]. The baby may experience early weaning from breast milk, and subsequent behavioral problems [4].

FCIS is multifaceted with several interacting factors [11]. Consequently, parents who seek help regarding their fuss-crybabies sometimes get conflicting advice from multiple health services, including emergency departments, and may be admitted for observation or treatment [1,2,11]. Frankly, conflicting medical advice, which is corroborated by discipline-specific interpretations of the available scientific evidence, is costly [11]. Indeed, research has shown that parents experience difficulties when searching for the required help to resolve the problems of their fuss-crybabies [1]. These problems exert serious consequences on the family and are costly to manage [8]. It is therefore imperative to prevent FCIS. Indeed, prevention of these problems can avert the negative outcomes and reduce economic burden on families and the healthcare system.

Unfortunately, however, there is no proven standard treatment for FCIS [9]. There are promising pharmacological agents such as Simethicone, Dicyclomine hydrochloride and Cimetropium bromide for treatment of FCIS, but there are conflicting results with potential side effects [9]. This substantiates the lack of inconsistent and ineffective management for this distressing and prevalent condition in babies. Relatively recently, Douglas et al. used an integrated, interdisciplinary primary care intervention approach termed "The Possums Approach" to manage FCIS [11].

Several reports have showed the therapeutic effectiveness of reflexotherapy [13–16]. This traditional and complementary therapy uses application of deep massage by a trained therapist to specific areas, representing various organs on the ears, hands, and feet [17]. These areas in reflexotherapy are considered as projections of the different organs or tissues of the body. The most widely used region of the body in reflexotherapy is the foot [18]. It has been asserted that reflex arcs related to the different organs and tissues begin from specific small areas on the foot in foot reflexotherapy. Studies have shown that foot reflexotherapy play an important role in reducing the severity of various health problems including gastrointestinal and sleep disorders [19–23]. However, the effect of foot reflexotherapy in FCIS is not known.

The purpose of the present study was to investigate the effect of foot reflexotherapy in fuss-crying, abdominal bloating, distension and sleep disorders in infants.

MATERIAL AND METHODS

Ethics

The experimental protocol was in accordance with international ethical standards and no inconformity was found in relation to the Helsinki Declaration (1975, revised in 1996-2013).

Participants

Seven (7) babies and their parents were involved in the study. The mean age of the babies was 2.01 months (average of 10 days – 98 days). The crying babies with abdominal distension were recruited through advertisements on notice board of a university hospital (Nizamiye Hospital) in Abuja, Nigeria. After a telephone interview, potential participants were invited to the Nile University of Nigeria, College of Health Sciences. The aims and objectives of the study were explicitly explained to the parents of babies before commencement of the study. All parents voluntarily gave a written informed consent to participate in the study. Patients with anatomic or organic abdominal pain such as an intestinal obstruction, Hirschsprung disease were not included.

Data collection

The subjective data were collected using a Likert scale. The Likert scale is a simple method used for the assessment of variations in the subjective intensity of fuss-crying, abdominal pain and associated problems in infants. A score of zero represents no crying, abdominal pain and sleep disorders (difficulties in settling for sleep or sleep walking), while a score of "3" represents "extreme". Medical history of lactose intolerance, milk allergy, and other problems were retrieved. We also retrieved the abdominal x-ray investigations of each baby from their case files to certify the cause of abdominal distension as a functional disorder.

Foot reflexotherapy

Foot reflexotherapy was performed according to the recommendation of Hanne Marquardt, a pioneer of this complementary therapy technique [24]. Briefly, using the thumbs and fingers of the working hand, appropriate pressure was applied to specific areas of both feet of each baby. These areas correspond to the projection zones of the brain and intestines on the foot (Figure 1) and represent classic foot reflexotherapy zones chosen in all reflexotherapies. Reflexotherapy was applied to both feet one time each day (for duration of 20 minutes per session) for two weeks in all babies. Foot reflexotherapy was applied to all patients by one of the authors (SD) who is a senior medical doctor and has many studies on reflexotherapy and other complementary medicine techniques. Further details on the technique have been described [24].

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 16.0 for Windows. All data had the normal distribution. The paired sample t-test was used for analysis. A p value of ≤ 0.05 was considered statistically significant.

RESULTS

All babies included in this study had only functional abdominal bloating and distention. Medical history revealed that no baby had lactose intolerance; however, the fathers of two babies had a history of lactose intolerance. There was statistically significant decrease in all colic scores after foot reflexotherapy (Table 1). Paroxysms of fusing (t=4.77, p=0.003), agitation or crying (t=5.46, p=0.002), back arching (t=6, p=0.001), lifting of legs (t=6, p=0.001), abdominal distention (t=9.29, p=0.00), abdominal tenderness (t=7.07, p=0.00) and sleep deprivation (t=8.22, p=0.00) were significantly decreased after foot reflexotherapy (Table 1). Abdominal bloating and distention seen on the abdominal x-ray before therapy, associated sleeping disorders, crying and other problems completely disappeared after foot reflexotherapy.

DISCUSSION

The results of this study have shown that foot reflexotherapy is beneficial and very effective in FCIS and associated problems such as sleep disorders. This complementary therapy significantly decreased all scores of the infantile colic scale with virtually no harmful effects in the babies. Thus, foot reflexotherapy can be used for alleviating symptoms of FCIS and associated problems.

Fuss-crying with abdominal bloating and distention in newborns and infants is one of

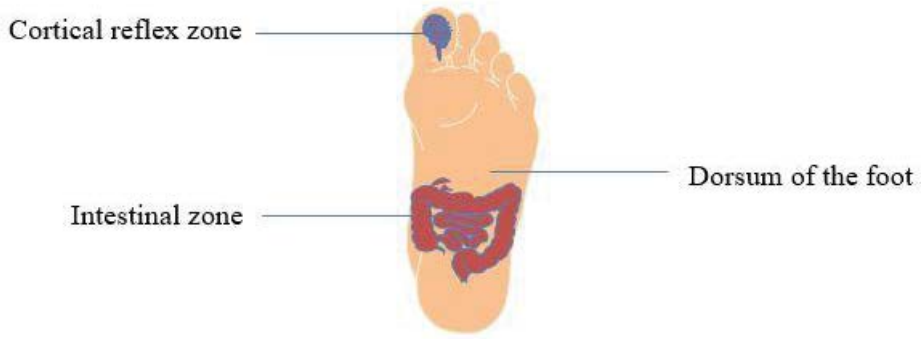

Figure 1: Zones of reflexology for intestines and brain.

Table 1: Colic scores before/after foot reflexotherapy using a Likert scale for assessment.

	Paroxysms of fussing	Agitation or crying	Back arching	Lifting of legs	Abdominal swelling	Abdominal tenderness	Sleep deprivation
Case 1	3/0	2/0	3/1	2/0	03-Jan	1/0	03-Jan
Case 2	2/0	3/1	2/0	2/0	02-Jan	3/1	3/0
Case 3	3/1	3/1	2/0	2/0	03-Jan	3/1	2/0
Case 4	0/0	0/0	0/0	0/0	1/0	1/0	3/0
Case 5	2/0	3/0	3/1	3/1	3/1	2/0	2/0
Case 6	3/1	3/1	3/1	3/1	2/0	1/0	1/0
Case 7	1/0	3/1	3/1	2/0	2/0	2/1	2/0
t	4.77	5.46	6	6	9.29	7.07	8.22
p	0.003	0.002	0.001	0.001	0	0	0

the most disconcerting issues in pediatrics. As early as 1954, Wessel introduced the famous "rule of three" criteria: "a symptomatic disorder characterized by paroxysms of fussing, agitation or crying, lasting more than 3 hours a day and occurring more than 3 days per week for at least 3 weeks" [25,26]. Evidently, these criteria are now outdated and there is no clear definition and causes for the condition. More so treatment includes heterogeneous and not clearly defined approaches in different groups of infants with different problems [27–29]. Though the definition of "excessive infant crying syndrome" [30] is preferred, the word "colic" or "fuss-cry" is still used and can be defined as an acronym standing for "obscure lengthy infant crying". It is characterized by paroxysms of excessive and inconsolable crying. The infant might present with a tense abdomen, flexion of lower extremities towards the abdomen, and appear flushed. Symptoms typically start around the second week of life, peak around 3-6 weeks, but may resolve by 3 months of age [29,31]. But irritability in infantile colic may last longer than the 3-month duration. However, some symptoms may persist up to 2 years of age in some children [11,12]. In addition to cow milk allergy and excessive intestinal gas due to lactose intolerance, the term "obscure lengthy infant crying" now includes digestive disorders such as constipation and gastroesophageal reflux [31,32], and hypertrophic pyloric stenosis [33]. Some babies may exhibit fuss-cry behavior without meeting the actual criteria for colic. An irritable or fussy infant can be described as one who is generally difficult to calm, and is only content when held, but cries more than a contented baby. Besides, a fussy baby may sleep poorly for short periods of time. Current medical treatment for FCIS is to prescribe medication for intestinal gas, although pharmacological treatment is not more effective than placebo treatment [9]. Consequently, parents are often told to be patient until the baby grows out of it. It has also been suggested that chiropractic care, utilizing a combination of both spinal and cranial adjustment may reduce fussy behavior in infants. Indeed, fussiness may be due to discomfort arising from mechanical restriction in the baby's neck or cranium. Such mechanical problems may cause muscle spasm and headache, thereby resulting to increased irritability that ultimately culminate in poor feeding, sleep deprivation and prolonged crying [5].

Though, fuss-crying in babies may not constitute an avenue for worry from the medical point of view. However, it can be very distressing for the parents and the baby, with associated parental psychological disorders – which are the most prevalent consequences associated with the condition. Organic disorders may constitute about 5% of cases of fuss-crying in babies, but most causes of this distressing condition are not exactly known. However, multiple interacting factors such as environmental, cultural, psychosocial, and biologic factors may be responsible [1,4,8]. In some cases, the condition can lead to infant hospitalization [34]. Some emerging methods and approaches have been investigated with mixed results and side effects. For example, pharmacotherapy of FCIS has shown conflicting results with adverse effects [9]. Parental soothing using swaddling movement and sound was shown to reduce the problems of fuss-crying in infants without abdominal bloating and distention [34]. Other approaches in alleviating the problems of FCIS with abdominal bloating and distention have yielded positive results [11]. However, there is no clear-cut recommendation on the management of FCIS, especially when it is associated with abdominal bloating, distention, and sleep disorders. To this end, the results of this study provide some information that may help to strengthen the database on management of FCIS and associated problems.

Though the mechanisms involved in the effects of foot reflexotherapy on FCIS and associated problems are not fully understood, some authors have suggested a possible role of the neuroimmune system in mediating the positive effects of foot reflexotherapy on the body. Foot reflexotherapy is believed to mediate a balance between sympathetic and parasympathetic divisions of the autonomic nervous system, and also, stimulate the release of neuromediators that act on local and distant sites to regulate physiological processes that maintain a balanced functioning of the body [35–42]. Indeed, reflexotherapy has been used to ameliorate the symptoms of numerous disorders in humans, including chronic pain, psychological stress [19, 35], attention-deficit/ hyperactivity disorder [37] and other disorders [35,36]. Thus, foot reflexotherapy is a practically harmless treatment technique that can be used to address the maladies of babies and children in different health conditions.

REFERENCES

1. Douglas P, Hill P. Managing infants who cry excessively in the first few months of life. Br Med J 2011; 343:d7772.
2. Douglas PS, Hiscock H. The unsettled baby: crying out for an integrated, multidisciplinary primary care approach. Med J Aust 2010; 193:533-536.
3. Keefe MR, Kajrlsen KA, Lobo ML, et al. Reducing parenting stress in families with irritable infants. Nurs Res 2006; 55:198-205.
4. Wake M, Morton-Allen E, Poulakis Z, et al. Prevalence, stability, and outcomes of cry-fuss and sleep problems in the first 2 years of life: Prospective community-based study. Pediatrics 2006; 117: 836-842.
5. Alcantara J, Anderson R. Chiropractic care of a pediatric patient with symptoms associated with gastroesophageal reflux disease, fuss-cry-irritability with sleep disorder syndrome and irritable infant syndrome of musculoskeletal origin. J Can Chiropr Assoc 2008; 52: 248-255.
6. Douglas PS. Excessive crying and gastro-oesophageal reflux disease in infants: misalignment of biology and culture. Med Hypotheses 2005; 64:887-898.
7. James Roberts I. Infant crying and sleeping: Helping parents to prevent and manage problems. Prim Care 2008; 35:547-567.
8. Cook F, Bayer J, Le HN, et al. Baby Business: A randomised controlled trial of a universal parenting program that aims to prevent early infant sleep and cry problems and associated parental depression. BMC Pediatr 2012; 12:13.
9. Hall B, Chesters J, Robinson A. Infantile colic: A systematic review of medical and conventional therapies. J Paediatr Child Health 2012; 48:128-137.
10. Hiscock H, Cook F, Bayer J, et al. Preventing early infant sleep and crying problems and postnatal depression: a randomized trial. Pediatrics 2014; 133:346-354.
11. Douglas PS, Miller Y, Bucetti A, et al. Preliminary evaluation of a primary care intervention for cry-fuss behaviours in the first 3-4 months of life (The Possums Approach): Effects on cry-fuss behaviours and maternal mood. Aust J Prim Health 2015; 21:38-45.
12. Missler M, Beijers R, Denissen J, et al. Effectiveness of a psycho-educational intervention to prevent postpartum parental distress and enhance infant well-being: Study protocol of a randomized controlled trial. Trials 2018; 19:4.
13. Carles M, Pulcini A, Macchi P, et al. An evaluation of the brachial plexus block at the humeral canal using a neurostimulator (1417 patients): The efficacy, safety, and predictive criteria of failure. Anesth Analg 2001; 92:194-198.
14. Hughes M, Smyth S, Lowe-Strong AS. Reflexology for the treatment of pain in people with multiple sclerosis: A double-blind randomised sham-controlled clinical trial. Mult Scler 2009; 15:1329-1338.
15. Gunnarsdottir TJ, Peden-McAlpine C. Effects of reflexology on fibromyalgia symptoms: A multiple case study. Complementary Ther Clin Pract 2010; 16:167-172.
16. Lee YM. Effects of self-foot reflexology on stress, fatigue, skin temperature and immune response in female undergraduate students. J Korean Acad Nurs 2011; 41:110-118.
17. Dougans I. The complete illustrated guide to reflexology: Therapeutic foot massage for health and well-being. New York, USA: Barnes and Noble 1999.
18. Unal C, Welcome MO, Salako M, et al. The effect of foot reflexotherapy on the dynamics of cortical oscillatory waves in healthy humans: An EEG study. Complement Ther Med 2018; 38:42-47.
19. Otter S, Church A, Murray A, et al. The effects of reflexology in reducing the symptoms of fatigue in people with rheumatoid arthritis: A preliminary study. J Alternative Complement Med 2010; 16:1251-1252.
20. Ozdelikara A, Tan M. The effect of reflexology on chemotherapy-induced nausea, vomiting, and fatigue in breast cancer patients. Asia Pac J Oncol Nurs 2017; 4:241-249.
21. Stephenson NL, Weinrich SP, Tavakoli AS. The effects of foot reflexology on anxiety and pain in patients with breast and lung cancer. Oncol Nurs Forum 2000; 27:67-72.
22. Valiani M, Babaei E, Heshmat R, et al. Comparing the effects of reflexology methods and Ibuprofen administration on dysmenorrhea in female students of Isfahan university of medical sciences. Iran J Nurs Midwifery Res 2010; 15:371–378.
23. Lee J, Han M, Chung Y, et al. Effects of foot reflexology on fatigue, sleep and pain: a systematic review and meta-analysis. J Korean Acad Nurs 2011; 41:821-833.
24. Marquart H. Reflexotherapy of the feet. 2nd Edn Stuttgart, Germany: Thieme 2016.
25. Douglas PS, Hill PS. The crying baby: What approach? Curr Opin Pediatr 2011; 23:523-529.
26. Wessel MA, Cobb JC, Jackson EB, et al. Paroxysmal fussing in infancy, sometimes called colic. Pediatr 1954; 14:421-435.
27. James-Roberts I. What is distinct about infants "colic" cries? Arch Dis Child 1999; 80:56-62.
28. Lucassen PL, Assendelft WJ, van Eijk JT, et al. Systematic review of the occurrence of infantile colic in the community. Arch Dis Child 2001; 84:398-403.
29. Barr RG, Rotman A, Yaremko J, et al. The crying of infants with colic: A controlled empirical description. Pediatri 1992; 90:14-21.
30. Poole SR. The infant with acute, unexplained, excessive crying. Pediatri 1991; 88:450-455.
31. Savino F. Focus on infantile colic. Acta Paediatr 2007; 96:1259-1264.

32. Infante Pina D, Badia Llach X, Ariño-Armengol B, et al. Prevalence and dietetic management of mild gastrointestinal disorders in milk-fed infants. World J Gastroenterol 2008; 14:248-254.

33. Onesimo R, Giorgio V, Monaco S, et al. A crying baby: Not simply infant colic. BMJ Case Rep 2012; 2012:BCR2012006544.

34. Möller EL, de Vente W, Rodenburg R. Infant crying and the calming response: Parental versus mechanical soothing using swaddling, sound, and movement. PLoS One 2019; 14:e0214548.

35. Isik B, Aydin D, Arslan M, et al. Reflexological therapy induces a state of balance in autonomic nervous system. Clin Invest Med 2015; 38:244–248.

36. Dane S. The effect of foot reflexotherapy on acute low back pain: A pilot study. J Res Med Dent Sci 2019; 7:13-16.

37. Dane S, Welcome MO. A case study: Effects of foot reflexotherapy on ADHD symptoms and enuresis nocturia in a child with ADHD and enuresis nocturia. Complement Ther Clin Pract 2018; 33:139-141.

38. Arslan M, Yesilcam N, Aydin D, et al. Wet cupping therapy restores sympathovagal imbalances in cardiac rhythm. J Alternative Complement Med 2014; 20:318-321.

39. Olanipekun A, Alhassan AK, Musa FH, et al. The effect of foot bath therapy on the dynamics of cortical oscillatory waves in healthy humans: An EEG study. J Res Med Dent Sci 2019; 7:57-61.

40. Aydin D, Hartiningsih SS, Izgi MG, et al. Potential beneficial effects of foot bathing on cardiac rhythm. Clin Invest Med 2016; 39:48-51.

41. Yamamoto K, Aso Y, Nagata S, et al. Autonomic, neuro-immunological, and psychological responses to wrapped warm footbaths-A pilot study. Complement Ther Clin Pract 2008; 14:195-203.

42. Cal E, Cakiroglu B, Kurt AN, et al. The potential beneficial effects of hand and foot bathing on vital signs in women with caesarean section. Clin Invest Med 2016; 39:86-88.