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 fussing, 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

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 fussing (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

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


