

CONTRIBUTION OF CHIROPRACTIC THERAPY TO RESOLVING SUBOPTIMAL BREASTFEEDING: A CASE SERIES OF 114 INFANTS

Joyce E. Miller, DC,^a Laura Miller,^b Ann-Kristin Sulesund,^b and Andriy Yevtushenko^b

ABSTRACT

Objective: The purpose of this study was to describe the circumstances, clinical features, role, and results of chiropractic management of infants who were referred to a chiropractic clinic for failure to adequately feed at the breast.

Methods: Clinical case series of 114 infant cases of hospital-diagnosed or lactation consultant diagnosed feeding problems that were treated with chiropractic therapy in addition to routine care and followed to short-term result.

Results: The most common age of referral was 1 week (mean, 3 weeks; range, 2 days-12 weeks), and the most common physical findings were cervical posterior joint dysfunction (89%), temporomandibular joint imbalance (36%), and inadequate suck reflex (34%). Treatment was chiropractic therapy in addition to any support given elsewhere. All children showed some improvement with 78% (N = 89) being able to exclusively breast feed after 2 to 5 treatments within a 2-week time period.

Conclusion: Cooperative multidisciplinary care to support breastfeeding was demonstrated in this population. Chiropractic treatment may be a useful adjunct to routine care given by other professionals in cases of diagnosed breastfeeding problems with a biomechanical component. (*J Manipulative Physiol Ther* 2009;32:670-674)

Key Indexing Terms: *Pediatrics; Infant; Breast Feeding; Manual Therapy; Chiropractic*

Nothing is more important to the short and long-term health of the newborn than mother's milk.¹ All mammals breast feed; almost all do so successfully. Only humans have a high failure rate. Between 12.8% and 44% of infants reportedly experience suboptimal infant breastfeeding (SIB).² Exclusive breastfeeding for the first six months is recommended by the American Academy of Pediatrics, the World Health Organization, and Healthy People 2010.³⁻⁶

Although breastfeeding is the optimal form of nutrition for the infant, mother, and society, formula feeding is sometimes necessary although it has down-sides. One study showed that owing to having more illnesses, formula-fed infants cost the health care system substantial amounts of

money in the first year of life.⁷ They found that formula feeding costs between \$331 and \$475 per infant in doctor's visits the first year. Breastfeeding is an important nutritional and developmental component of infant life, shown to decrease the risk of many childhood illnesses.⁷ Acute otitis media is 50% less likely to occur in children that are breastfed for at least 3 or 6 months.⁸ Children before the age of 10 years with a family history of asthma are 40% less likely to have asthma if they were breastfed for at least 3 months compared with those who were not breastfed.⁸ Infants who were exclusively breastfed for at least 4 months were 3 times less likely to suffer severe respiratory tract infections, which necessitated hospitalization.⁹

Risk of sudden infant death syndrome is reduced by 50% if infants are exclusively breastfed according to a large study recently conducted in Germany.¹⁰

Breastfeeding has lifelong positive effects. Infants who were breastfed were much less likely to suffer from obesity and type 2 diabetes in adult age.^{11,12} A meta-analysis of 17 studies showed that duration of breastfeeding in infancy was inversely proportional to the risk of being overweight in adult life.¹² Each additional month of breastfeeding was associated with a 4% reduction in risk of excessive weight later in life.¹³

Our aim was to review cases of infants who had been referred to a chiropractic teaching clinic and who demonstrated persistent feeding difficulties and to describe the outcomes following chiropractic care. The united goal set by

^a Senior Clinic Tutor, AECC; Lead Tutor MSc Advanced Professional Practice Chiropractic Paediatrics, Bournemouth University, Bournemouth, UK.

^b AECC Student, Bournemouth University, Bournemouth, UK. Submit requests for reprints to: Joyce E. Miller, DC, Senior Clinic Tutor, AECC; Lead Tutor MSc Advanced Professional Practice Chiropractic Paediatrics, Bournemouth University, Bournemouth, Dorset BH5 2DF, UK (e-mail: jmiller@aecc.ac.uk).

Paper submitted April 28, 2009; in revised form July 13, 2009; accepted July 27, 2009.

0161-4754/\$36.00

Copyright © 2009 by National University of Health Sciences.

doi:10.1016/j.jmpt.2009.08.023

Table 1. Historical data collected and clinical examination performed

Historical data	Examination procedures
Prenatal and birth history	Vital signs
Breast “refusal”	Neurological examination
Ability to latch	Respiratory examination
Ability to maintain a seal	Cardiovascular examination
Efficiency and effectiveness of feeding	Inspection of the tongue, jaw, maxilla and mandible and full oral cavity
Feeding time	Examination of sutures/fontanelles
Preferred posture and position	Suck reflex grading (see Table 2)
Any pain the mother felt during feeding	Suprahyoid muscle group
Preferred side	External pharyngeal area
Patterns of feeding	Spinal examination
Need for artificial feed	Postural examination in prone, supine, ventral and vertical suspension
Types of feeding including syringe, cup or bottle	Spontaneous activity
Other factors the mother felt were pertinent	Height, weight, and head circumference measurement

the mothers and the health professionals was exclusive breastfeeding of the infant.

METHODS

This was a series of clinical cases of sub-optimal infant breastfeeding (SIB) collected consecutively when referred to a chiropractic teaching clinic between March and November 2008. All infants under 12 weeks of age referred by a medical practitioner for SIB were included. All other infants were excluded. After obtaining maternal consent, data were collected from parents, patient files, and discharge surveys. Types of historical and examination data collected are seen in Table 1. Suck reflex grading is seen in Table 2.

A diagnosis of SIB was made if the infant could not be fed exclusively at the breast. All patients had been previously diagnosed with SIB before referral to this clinic. A biomechanical diagnosis was made in the chiropractic clinic relative to any specific problem area located through the examination procedures. Treatment for the biomechanical problem was aimed at releasing the area of tension, imbalance or pain producing tissue through routine low force chiropractic manual therapy.

Table 2. Suck reflex grading (Joyce Miller 2004)

Grade	Description
0	No tension is created, spits out finger, nipple or dummy, cannot latch. This is a disordered suck resulting in inability to feed.
1	Tongue does not wrap finger or nipple, weak, ineffective tongue movement, may hold mouth open, may roll tongue to side, may have early gag reflex or appear to choke. This is a <i>dysfunctional</i> suck causing inadequate ability to feed.
2	Accepts nipple but has poor initiation of suck, may incompletely latch or partially close mouth around nipple, tongue comes up but unable to draw full areola into mouth, rests frequently and has immature suck/swallow/ respiration cycle. This is termed a <i>disorganized</i> suck and is uncoordinated. It results in a subtle effect on speed, skill or amount of food taken at any feed, leading to a less than satisfactory experience for the mother and child.
3	Tongue wraps finger or latches well onto nipple, good strength, full response with little rest. This is a fully <i>functional</i> suck and child is able to receive 80% of feed in 4-5 minutes.
4	Hard clamp; this is a suck that hurts the mother’s breast tissue. The infant may have a biomechanical dysfunction that requires additional force to obtain a feed.
5	Suck inhibited by <i>deformity</i> ; may have an anterior frenulum (tongue tie) and be unable to bring tongue forward enough to pick up nipple, a cleft palate or high palatal arch.

Outcomes data consisted of mother’s report of exclusivity of breastfeeding, rating of improvement (if any) and weight gain. Descriptive analysis was carried out using Microsoft Excel (Microsoft Inc, Redmond, WA). The study was approved by the Anglo-European College of Chiropractic Research Ethics subcommittee and any data from all patients were anonymous. All parents gave informed consent. There was no outside funding.

RESULTS

One hundred fifteen patients with suboptimal infant breast feeding 12 weeks or younger were reviewed. One was deselected as he was not referred by a medical practitioner thus not meeting the inclusion criteria. All but 2 of the 114 infants were classified as having ineffective suck function (grades 0-2), with the remaining 2 having excessive suck (grade 4). The mean age at presentation was 3.2 weeks (range, 2 days to 12 weeks). Fifty percent of infants were under 5 weeks of age and the most common age at presentation was 1 week.

Vital signs were within normal range in all infants. The main physical findings in the study population were cervical posterior joint restrictions (88.7%), temporomandibular joint imbalance (35.7%) and inadequate suck reflex (34%). Signs of birth trauma included conjunctival

-
- Altered tongue action resulting in ineffective latch
 - Decreased mandible excursion preventing wide mouth opening
 - Hypotonic suprahyoid muscle group preventing sufficient mouth opening
 - Displaced hyoid preventing balanced tongue activity
 - Aberrent cervical range of motion and/or posterior joint restrictions affecting infant posture and position
 - Hypo or hypertonic orbicularis oris, masseter, digastric muscles causing imbalance in muscle torque
 - Temporomandibular joint laxity or imbalance
 - Mechanical changes in neural function relative to cranial or cervical distortion
-

Fig 1. *Biomechanical problems treated with chiropractic manual therapy.*

hemorrhage, cephalohematoma, forceps scars, asymmetric occlusion, facial nerve palsy, brachial plexus injury, fractured clavicle, and severe jaundice.

Birth interventions were sustained by 41% of the infants. Sixty-eight percent of these infants were first-born. None of the parents had undergone any prior usage of chiropractic care for themselves or their families.

The types of biomechanical problems discovered and treated are shown in Figure 1.

The number of treatment visits ranged from 1 to 9 with a mean value of 4. The mode was 3 treatments and 33% of infants were discharged after this number. The outcome after treatment was based on the mother's rating of improvement (or not) in their infant's symptoms. This was in the form of a 10-point numerical rating scale as well as discussion with the parents. For the purpose of this study a score of 8 to 10 was classified as "completely better" because it resulted in the ability of the infant to exclusively breastfeed and 5 to 7 as "better" but requiring both bottle and breast feeding. Exclusive breast feeding was accomplished for 89 infants (78%). Twenty-three infants (20%) required at least some bottle feeding when released from care. Two infants were lost to follow-up. No negative side effects were reported.

DISCUSSION

Although none of the infants were presented specifically for birth trauma, almost 14% had frank signs of birth trauma and it has been proposed that bruising and trauma to the infant's cranium, face and spine during birth can lead to feeding difficulties.^{14,15} Although it is difficult (if not impossible) to precisely establish exact reasons for feeding problems in the infant, assisted births such as forceps, vacuum extraction and cesarean sections have been implicated. For example, vacuum extraction has been shown to be a strong predictor of early cessation of breastfeeding.¹⁶ In the present case series 10.4% of the experimental group experienced a vacuum extraction delivery compared to the 4.3% average reported for 3 local hospitals.¹⁷

Likewise, forceps delivery may exert excess pressure on cranial bones, which may alter symmetry of the cranium and/or jaw causing poor suck function in the baby.¹⁵ Forceps were used in 19.1% in this population compared to 3.9% in the local hospital averages.¹⁷

Because 68% of these infants were first-born, it can be said that this may be linked to the increased likelihood of delivery complications in primiparas as well as being linked to inexperienced mothers who may have a more difficult time with breastfeeding.¹⁸ Prematurity was not an issue as all infants were born full term.

Infants in this cohort had been seen by various health care practitioners which included one or more of the following: midwife, lactation consultant, pediatrician, general practitioner, feeding consultant and/or chiropractor. Infant feeding is seen as an urgent problem with no single answer. All professionals with skills in this arena are called upon to assist and cooperation is the rule rather than the exception. All of these infants had had pertinent investigations for pathology and extensive training with lactation consultants and/or midwives prior to referral for chiropractic care. Chiropractic skills fit into the realm of manual therapy to treat biomechanical problems. Once the feeding problems were determined not to be pathological, genetic, or maternal in origin, care by a manual therapist was appropriate. The young age of the children who were referred (1 week of age was the mode) may suggest that health care professionals are cognizant of the care, which is available and appropriate and recommend that care for the infant.

Our one specific outcome measure was ability to exclusively breastfeed (with maintenance of weight gain). We did not use any of the common rating instruments as they have not been validated in any controlled manner.^{16,19} Mothers were also given the opportunity to rate the improvement on a 10-point scale, so that they could record partial improvement, no improvement or worsening. At first glance, it seems that all of the infants improved somewhat in their ability to breastfeed. However, with exclusive breastfeeding as the primary outcome measure, it was simple to determine an exact success rate but impossible to credit that success to any specific modality of treatment. The degree of improvement that was related to the natural course of the condition as well as the maternal commitment and effort versus how much could be attributed to chiropractic intervention and/or support from lactation consultants cannot be established. Maturity of the infant, healing of injury or the effects of medication wearing off could result in an improvement in feeding without intervention.²⁰ That said, no child can be left to flounder whilst waiting for the natural history to take its course.

Not all of the infants graduated to exclusive breastfeeding. This can be seen as failure since exclusive breast feeding is the goal set by the World Health Organization⁵ as well as the clinicians and parents involved. Twenty per cent of the

infants (N = 23) had to be bottle-fed which often means with manufactured milk. It has been shown that early introduction of any artificial milk is associated with further decline in the use of mother's milk for the infant.²¹

Limitations

There were several limitations, some of which are inherent in a case series. This type of study, by its definition, cannot determine efficacy of the therapy given. A randomized controlled trial is the best way forward to determine conclusively whether manual therapy is a viable option to assist these mother-infant dyads to achieve exclusive breastfeeding.

Another weakness in this study is the lack of long-term follow-up. Exclusive breastfeeding to 6 months of age is recommended by the World Health Organization.⁵ In addition, there were multiple sources of birth information including parental report and hospital records, leaving room for error in data recall. Examination procedures were standard but may have been executed differently by multiple examiners. All infants either were concurrently or had been under care of other professionals, and there was no standardization of their contribution to the treatment of the infant.

Feeding difficulties in an infant are fraught with stress for the infant and the family. All professionals seek to support the mother/infant dyad in successful breastfeeding. There are several case studies, which suggest that a chiropractic approach to this issue may be useful.^{14,22-24} This study sought to discover any unique characteristics of infants presenting with breastfeeding problems and whether chiropractic care offered any benefits within the milieu of wider health care. Two points can be highlighted. First, there was a higher than average rate of birth intervention in this cohort, suggesting one possible etiology for a biomechanical problem. Second, given that all of these patients were sent by other health care professionals, there was a recognition that biomechanics may be part of the problem and that a chiropractic approach might be efficacious. Further higher-quality studies are required to determine whether this is the case.

CONCLUSION

This case series found that in a population of 114 infants referred by a medical practitioner to chiropractors for feeding difficulties, 89 (78%) were exclusively breast fed after 4 treatments. It is not known whether this is a result of chiropractic manual treatment, the cotreatment provided along with other health care providers or the natural course of this condition. Cooperative care may go some way forward to meet the enormous challenge of exclusive breastfeeding as a goal in developed populations where breastfeeding initiation is high but numbers rapidly decline after the first week.

Practical Applications

- Infants with suboptimal breastfeeding are at higher risk of being artificially fed which may create short and long-term problems for the child, the mother, and society.
- Suboptimal infant breastfeeding is recognized early by medical professionals who are in a prime position to refer for adjunctive care in a cooperative effort to solve the problem.
- For infants in this study, routine care plus chiropractic care resulted in the ability of 78% of infants to exclusively breastfeed.

FUNDING SOURCES AND POTENTIAL CONFLICTS OF INTEREST

The authors reported no funding sources or conflicts of interest.

REFERENCES

1. Jackson KM, Nazar AM. Breastfeeding, the immune response, and long-term health. *J Am Osteopath Assoc* 2006; 106:203-7.
2. Geddes DT, Langton DB, Gollow I, Jacobs LA, Hartmann PE, Simmer K. Frenulotomy for breastfeeding infants with ankyloglossia: effect on milk removal and suckling mechanism as imaged by ultrasound. *Pediatrics* 2008;122:188-94.
3. National Center for Health Statistics, 2009. Available at: <http://www.cdc.gov/breastfeeding>.
4. American Academy of Pediatrics, Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics* 2005;115: 496-506.
5. World Health Organization. Exclusive breastfeeding. Available at: <http://www.who.int/nutrition/topic/exclusivebreastfeeding> 2001.
6. US Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health; 2000.
7. Ball TM, Wright AL. Health care costs of formula-feeding in the first year of life. *Pediatrics* 1999;103:870-6.
8. Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, Trikalinos T, Lau J. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess* 2007;153:1-186.
9. Bachrach VR, Schwarz E, Bachrach LR. Breastfeeding and the risk of hospitalization for respiratory disease in infancy: a meta-analysis. *Arch Pediatr Adolesc Med* 2003;157: 237-43.
10. Vennemann MM, Bajanowski T, Brinkmann B, et al. Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics* 2009;123:e406-10.
11. Owen CG, Martin RM, Whincup PH, Davey-Smith G, Cook DG. Effect of infant feeding on the risk of obesity across the life course: a quantitative review of published evidence. *Pediatrics* 2005;115:1367-77.
12. Owen CG, Martin RM, Whincup PH, Davey-Smith G, Cook DG. Does breast feeding influence the risk of type 2 diabetes in

- later life? A quantitative analysis of the published evidence. *Am J Clin Nutr* 2006;84:1043-54.
13. Harder T, Bergmann R, Kallischnigg G, Plagemann A. Duration of breastfeeding and risk of overweight: a meta-analysis. *Am J Epidemiol* 2005;162:397-403.
 14. Holtrop DP. Resolution of suckling intolerance in a 6-month-old chiropractic patient. *J Manipulative Physiol Ther* 1999;23:615-8.
 15. Smith LJ. Impact of birthing practices on the breastfeeding dyad. *J Midwifery Womens Health* 2007;52:621-30.
 16. Hall RT, Mercer AM, Teasley SL, McPherson DM, Simon SD, Santos SR, Meyers BM, Hipsh NE. A breast-feeding assessment score to evaluate the risk of cessation of breastfeeding by 7-10 days of age. *J Pediatr* 2002;41:659-64.
 17. Birthchoiceuk.com [homepage on the Internet]. Birth Choice UK. Available from: <http://www.birthchoiceuk.com/Frame.htm>.
 18. Dewey KG, Nommsen-Rivers LA, Heinig MJ, Cohen RJ. Risk factors for suboptimal infant breastfeeding behaviour, delayed onset of lactation, and excess neonatal weight loss. *Pediatrics* 2003;112:607-19.
 19. Hazelbaker AK. The assessment toll for lingual frenulum function: Use in a lactation consultant private practice. Pasadena (Calif): Pacific Oaks College; 1993. Thesis.
 20. Jordan S. Infant feeding and analgesia in labour: the evidence is accumulating. *Int Breastfeed J* 2006;1:25.
 21. Hill PD, Humenick SS, Brennan ML, Woolley D. Does early supplementation affect long-term breastfeeding? *Clin Pediatr* 1997;345-50.
 22. Hewitt EG. Chiropractic care for infants with dysfunctional nursing: a case series. *J Clin Chiropr Pediatr* 1999;4:241-4.
 23. Vallone S. Chiropractic evaluation and treatment of musculoskeletal dysfunction in infants demonstrating difficulty breastfeeding. *J Clin Chiropr Pediatr* 2004;6:349-68.
 24. Sheader WE. Chiropractic management of an infant experiencing breastfeeding difficulties and colic: a case study. *J Clin Chiropr Pediatr* 1999;4:245-7.