Improvement in prematurity outcome: A chiropractic case report

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ABSTRACT

Purpose: Prematurity carries with it an increased risk of developmental delays, infections, language development disorders and delays, visual and visuocognitive development disorders and mental health issues later in life. The purpose of this case report is to add to the possible avenues of treatment to gain better outcomes for this population. **Method:** A thorough literature search of MANTIS, BioMed Central, PubMed and National Institute of Health (NIH) revealed that there was not one published case on the use of chiropractic in the treatment of prematurity. **Case:** In this case, the child was born at 26.6 weeks — after 14 weeks of antepartum hemorrhage(APH) and so was at the end of the spectrum for viability. He spent 58 days in neonatal intensive care unit (NICU) and a further 44 days in special care nursery (SCN) until he was released to go home. **Intervention:** The patient was treated chiropractically with low force techniques utilizing sacro-occipital cranial techniques and neurological stimulation to improve proprioceptive input to the cerebellum and to decrease the level of deformational plagiocephaly. **Outcomes:** Treatment was continuous throughout the first two years of life beginning weekly and then every two weeks for regular checkups. His most recent assessment through the Southern Health Growth and Development Clinic showed that he is achieving at least within the normal range for his age and frequently above average across the different scales of the Bayley Scales of Infant Development-3rd edition. **Conclusion:** The patient responded favorably to the regular chiropractic management of sacro-occipital technique and neurological stimulations exercises. He is now outperforming many of his non age corrected peers. It is the hypothesis of the author that the maintenance of normal joint function and movement — including the cranial sutures — globally enhanced the outcomes of this child and could be a source of improved outcomes for this demographic in the future.

Introduction

Prematurity is becoming more common and neonates are surviving at increased rates due to advances in medical care and intervention.[1] This comes with their increased likelihood to exhibit various health conditions from sensory to perceptive to motor disorders,[2, 3, 4, 5] as well as decreased immune function,[6] respiratory weakness[7] and mental health concerns.[8] The current treatment protocol is to monitor the child and deal with each issue as it arises.[9] Literature searches reveal a new body of evidence in neonatal and infant movement patterns, variation and variability as a predictor for normal or abnormal neuromotor development.[10, 11, 12, 13, 14]

Time spent out of the supported environment of the womb and laying on a bed in the neonatal intensive care unit (NICU) and special care nursery (SCN) will also increase the likelihood of the development of a deformational plagiocephaly which in turn can lead to neurodevelopmental disadvantage.[15]

Method

A literature search using the key words, chiropractic and prematurity, was completed using MANTIS, Biomed Central, PubMed and National Institute of Health. There were no case series or case reports available on the use of chiropractic in the treatment of prematurity. It did reveal a number of publications which were used to supply the background for this case report.

Case Report

In this case, the patient was born by elective caesarean at 26.6 weeks under general anesthesia at the Mercy Hospital in Melbourne, Victoria, Australia.

His mother had a bleed at 11 weeks and then off and on until a significant hemorrhage at 20 weeks and then continuously for the duration of the pregnancy.

She was hospitalized from 25 weeks. As there was decreasing amniotic fluid and an evolving retroplacental hematoma, an elective caesarean was performed. The baby cried spontaneously at birth and his Apgars 5 and 9 at 1 and 5 minutes respectively. His birth weight was 1091 grams. Intermittent positive pressure ventilation (IPPV) was given for 30 seconds due to gasping respirations, and oxygen was increased to 40%. He commenced on continuous positive airway pressure (CPAP) for three days then weaned from high flow to low flow. He was diagnosed with respiratory distress syndrome (RDS), moderate patent ductus arteriosus (PDA), jaundice and presumed sepsis.

The baby was 58 days in the NICU at the Mercy Hospital and another 44 days in the SCN at the Frankston Hospital. He was fed breast milk by nasogastric tube until he could suck and begin to feed from the breast. His cranial ultrasound was normal. He was given 4 courses of antibiotics in the first 5 days, 1 dose of Indocid which had no impact on the PDA, and caffeine.

The parents decided to delay the vaccination schedule.

Intervention

The baby was examined in clinic when he was 104 days old. He was chiropractically adjusted at least weekly through the first year and biweekly through the second. The chiropractor was able to assess all primitive reflexes and monitor them for inhibition and encourage the parents to provide tactile stimulation to aid integration. They were asked to move the child and to carry him papoose-style to increase cerebellar stimulation. The treatment consisted of sacro-occipital technique,[16, 17] involving primarily a hold and release strategy to any pelvis or spinal segments that were determined by static and motion palpation to have reduced mobility. Cranial molding techniques were employed that principally involved a fronto-occipital hold to aid the cranial motion to flare the flattened temporo-parietal areas. No adverse events were reported as a result of this treatment.

In the second year as the child became ambulatory, extra stimulation was given to the feet in the form of rubbing and stroking.

During the course of treatment the child had only 1 diagnosable condition, that being a zinc deficiency which manifested as a facial rash and was first misdiagnosed as a staph infection. This is the only time since hospital discharge that the child was prescribed antibiotics before chiropractic care began.

Outcome

The patient was assessed by the staff and pediatrician at Southern Health and Growth Clinic, part of the Monash Medical Centre, when he was:

Chronological age: 27 months 9 days
Corrected age: 24 months 24 days

The Bayley Scales of Infant Develpoment-3rd Edition (BSID-III) was used in assessment. This is a direct observation test that has three major parts: Cognitive, Language and Motor development scales. Scores are made with reference to the ranges found in American children. It has been observed that Australian children may perform better overall than their American counterparts.

The patient scored:

TEST SCALE	TEST COMPOSITE SCORE AND RANGE	DESCRIPTION
Cognitive Scale	110 (101-117)	Above Average
Language Scale	89 (83-97)	
- Receptive		Average
- Expressive		Low Average
Motor Scale	103 (95-112)	
- Fine Motor		Above Average
- Gross Motor		Above Average

The patient had to travel a long distance to be examined and as he was tired when it came to testing this would probably have affected his expressive language rating. The examiner noted that what was noted was very precise and that this score was likely to be an underestimation of his abilities. It was also noted that the gross motor score may also be an underestimation.

The parents had no concerns about the child's development. He presented as a healthy, well-grown boy with two older siblings who he enjoys playing with.

Chiropractic examination revealed that all primitive reflexes had integrated within normal ranges and all developmental milestones were reached at expected age ranges.

The mother reported that the child had generally been well and had not required further antibiotic therapy. This was despite his older siblings being exposed to a pertussis outbreak at their kindergarten and school.

Discussion

Much is known and has been published about the deleterious effects of prematurity. As viability has reached 25 weeks gestation, these outcomes and how to maximize function of the neonate and infant become more challenging.

Prematurity is known to lead to: retinopathy,[18] speech and language disorders,[19, 20, 21] mental health issues,[8] sensory disorders,[22] motor function disorders, cognitive impairment, immune immaturity[6] and increased infection. All of which contributes stress to their families.[23] There is a developing body of evidence that movement patterns, variation and variability can predict some of these outcomes. It is therefore this author's contention that maximizing normal movement and proprioceptive input through increased joint function and proprioceptive firing aids in normal brain development and therefore gentle chiropractic adjustments and movement contributed to a better than average

outcome in this case.

It is also noted in the literature that deformational plagiocephaly can put infants at a neurodevelopmental disadvantage.[24, 25] Deformational plagiocephaly occured in this case as a result of prolonged periods of time lying on alternating sides in the hospital. It is the author's hypothesis that chiropractic and osteopathic cranial techniques could impact both the plagiocephaly and the overall developmental outcome and warrant additional consideration.

Conclusion

This case demonstrates the efficacy of chiropractic to promote normal neurological development, which can be assessed through cognitive ability, receptive and expressive language, fine and motor skills and general wellbeing.

There is no documented evidence of chiropractic adjustments and cranial molding being beneficial for the premature infants. This author contends that further investigation could lead to beneficial outcomes for more children and their families.

No adverse reactions were documented throughout the course of treatment.

Informed consent was obtained from the parents for the writing of this report.

All procedures conformed to the ethical standards of the New Zealand College of Chiropractic.

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