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ASRF CASE REPORT PROJECT

Improvement in low tone and retained primitive reflexes in a 15-week-old female concomitant with Chiropractic care: A case report

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Background: A fifteen-week-old infant was presented for chiropractic care with the mother listing concerns that the infant could not participate in life the way she should. The infant was behind on all her milestones, was showing head asymmetry, and inability to to lift her head or respond to caregivers the way she should.

Intervention: The infant commenced a course of chiropractic care, during which the patient was adjusted using the Diversified technique, with assistance from the baby drop piece, vibrations, hands-on adjusting, Sacro-occipital technique basics and cranial adjusting. Dural support was used, along with Activator methods and logan, all of which were modified for age-appropriateness.

Outcomes: In addition to significant improvements in her subluxations, the infant was able to make strong leaps forward in tone, responses and reflex integration. She was able to fully regain age-appropriate developmental milestones and undertake strength and skill-based tests appropriate to her age. Parents remarked that she was like a completely different child.

Conclusion: This case report illustrates an instance in which a child's developmental trajectory was significantly changed by chiropractic care. Given the outcomes of this case, the impact of chiropractic care on infant development is warranted.

Indexing Terms: Chiropractic; Subluxation; adaptation; developmental signposts; infant care.

Introduction

The way an infant adapts to life outside the womb is a vital part of neurodevelopment and forms the foundation of a young child's life. When an infant fails to adapt well, the impact this can have stretches way beyond whether or not a child can lift their head.

Research has recently begun to investigate the impact of retained primitive reflexes, and has begun to extrapolate the effects that may take place over time. A 2018 study linked persistent primitive reflexes with motor control problems in otherwise healthy preschool children. (1) In the study, Gieysztor et al found that the greater the severity of the retained reflex, the

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lower the motor efficiency. Furthermore, they suggested that therapeutic interventions to integrate the retained reflex were vital to improve early psychomotor development and prevent difficulties that may arise with social function and school life.

Melilo et al (2022) further explored the relationship between cognitive deficits and retained primitive reflexes, acknowledging the controversial but growing nature of the topic. In the study, the authors pointed out that retained primitive reflexes have been '*noted in several neurobehavioral disorders including ADHD and ASD*.' (2)

While more research emerges, and while the topic may remain controversial, it is vital to understand how to support proper integration of these reflexes to further support infant neurodevelopment and a 'normal' trajectory over time.

Below the layer of retained primitive reflexes and a child's ability to clear their milestones or lift their heads, thus developing the cervical curve, is the issue of cortical connectivity. Underdeveloped cortices, or stagnated cortical development and connectivity may show up as any number of challenges over time. (3) These include functional and neurobehavioral disorders, thus what we do in adjusting subluxation to support cortical maturation is vital, albeit poorly understood.

Chiropractic literature is yet to fully explore how cortical connectivity links to retained primitive reflexes, low tone and developmental delay.

This case discusses an infant who was failing to adapt to life outside the womb. Retained primitive reflexes and low tone were two ways in which this was manifested, and Chiropractic care was the only change to the infant's care. In this case, maternal birth trauma and extreme difficulties during gestation may have impacted or stagnated cortical development in the child, thus manifesting in the issues explained below.

Case details

A 15-week-old infant was presented for Chiropractic care by her parents. She was described as '*not adapting well to life outside the womb*'. Upon presentation to a Chiropractic clinic, examination revealed that her physical development and movement were of a low-tone newborn. She could hardly lift her head and did not respond well to caregivers. The infant's mother was becoming very worried that she had an undiagnosed developmental issue due to the severity of her lethargy and response to stimuli. This became the primary concern, in addition to her inability to participate in life as a 15-week-old should be expected to.

Her case history included a premature birth at 36 weeks gestation. At the time of her presentation, she struggled with tummy time, favouring one way with her head. Her tendency to favour one side was also affecting feeding. Head asymmetry was already noted.

Maternal gestational history included a high-stress pregnancy and maternal epilepsy of the temporal lobe. The mother suffered from a COVID-19 infection during pregnancy and rated her morning sickness as severe. After delivering the infant via C-section due to illness, the mother was discharged from hospital early due to '*terrible care*'.

Formula was introduced early due to a lack of breastfeeding support in the hospital, where no pump was provided. The infant was then fully formula-fed from three weeks.

Clinical findings

An initial consultation took place in November of 2022, with review sessions after one month and three months respectively. At the first consultation, the infant had seven cranial restrictions. Subluxations were noted at the Atlas and Occiput bilaterally and at C0, C1, C5, T2, T4, L1, S3, and S4. Both shoulders and the left ankle were also subluxated.

At the initial consultation, the *Well Kids Assessment* was used, during which the patient was tested using active and passive range of motion tests, cranial assessments, peripheral orthopaedics, and subluxation assessments. A tone assessment was used, during which the Chiropractor assessed the infant's ability to perform vertical suspension, pull-to-sit, prone extension, supine positioning, scarf sign, arm recoil and more. Cranial nerves, muscle strength, and primitive and postural reflexes were tested as well as gross motor skills.

Numerous abnormalities were detected during this thorough exam. The patient was approximately 7 weeks behind on her milestones. She was nearly four months old but was testing like a low-tone newborn. Stretch reflexes were all under-active, and four primitive reflexes were present but not age-appropriate nor symmetrical. Postural strength and gross motor ability were poor at the initial consult, with the infant unable to undertake pull-to-sit and prone extension tests.

Care plan

The infant was placed on an initial care plan where she was seen three times per week for two weeks, and then twice a week for two weeks. Following this initial course of care, she was seen again twice a week for four weeks before moving to a maintenance care plan where she was seen once per week for twelve weeks.

During this time, the patient was adjusted using the Diversified technique, with assistance from the baby drop piece, vibrations, hands-on adjusting, Sacro-occipital technique basics and cranial adjusting. Dural support was used, along with Activator methods and Logan, all of which were modified for age-appropriateness.

Additional care recommendations were initially given to include right neck stretches, left neck strengthening exercises, rolling back to front and front to back, ball rocking and probiotic usage. Shoulder protection instructions were also given.

At the second review, additional recommendations were given to include left-body '*jiggle pops*'*, and more robust big-body play to stimulate the right brain. Parents were also advised to add massage, baths, singing and a lot of smile sessions. As the patient had aged by the third review session, the additional care recommendations were amended to include kneeling play, pull-to-sit exercises, Z-sit exercises, wheelbarrow on pillows, cross crawl and other pillow play. Parents were also advised to carry her using the '*football hold*' while walking through the house.

The aims of care began with establishing better tone and shoulder stability, together with resolving subluxations at C0 and C1. The Chiropractor aimed to support the patient's body to function at its best by focusing on restoring normal spinal ROM with a particular focus on neck and sacral areas. Shoulder stability and supporting better upper body tone development were also a focus. Long-term goals included seeing improvement in general tone, neck extension and shoulder strength.

At the second review, the focus of care remained on improving tone. The Chiropractor wished to see continued improvements in ROM, function, nerve firing, muscle activation and brain function. They continued working on subluxations, right brain stimulation and postural tone development. Long-term goals included seeing the patient catch up with her strength and gross motor function.

At the third review, the focus of care moved to extension, flexion and rotation, and shoulder strength. Here, the Chiropractor aimed to support the patient's progression for a strong and optimal functioning body and nervous system. This included a continued focus on the development of tone, shoulder strength and general core strength in flexion, extension and rotational.

Outcomes

In the first and second reviews, parents noted that sleeping patterns and quality had improved, along with a notable improvement in head shape. The infant was now more active and showed improvements in movement and strength. Where tummy distension, bloating and excessive wind had been noted as problematic at the initial consultation, bowel regularity had now improved with constipation resolving.

The infant's general resilience was also showing improvement, along with significant improvements in head and neck control, core strength and use of the neck and head. This allowed tummy time to become manageable and she was now rolling front to back and back to front. Some tightness remained in all limbs, and the Chiropractor began to support the parents with tongue tie and feeding options, including providing education on early intervention for low tone.

At the second review, subluxations had reduced to a mild C0/AS subluxation and subluxations C1, C7, T5, L5, S2/3. Bilateral subluxations remained at the shoulders, wrist and left ankle.

By the third review, these had further reduced to C0, left Atlas, and C7, S3, left Sacroiliac Joint. Peripheral subluxations had reduced to the left shoulder and left sternoclavicular joint.

At the third review, the T1 subluxation had resolved completely. While at the beginning, there was a strong double Atlas and Occiput subluxation, this had reduced significantly. Some sacral restriction was still noted at the third review, but there was exceptional improvement in tone. Given the extremely low tone at the beginning, the fact the infant was now testing at an age-appropriate level at the third review was significant. This was tested using ventral and vertical suspension and the pull-to-sit tests.

Cranial nerves also showed marked improvement, reducing from 7 restrictions to 3. Stretch reflexes, which were under-active at the first and second reviews, had normalised by the third review. Primitive reflexes had also improved significantly, from four non-age-appropriate retained primitive reflexes to one functioning but age-appropriate reflex.

Postural responses had improved significantly and were now age-appropriate. Gross motor skills had vastly improved. In the beginning, the infant was unable to perform pull-to-sit tests or prone extension and now she was able to achieve this as well as new age-appropriate exercises and tests.

Subjective feedback from parents included that they were extremely grateful and '*absolutely blown away by the changes*' and they could not believe it was the same child. This alleviated parental concerns that the child had a serious developmental delay.

Discussion

This case illustrates the profound impact of Chiropractic care in supporting the developing nervous systems of infants, even those who are failing to thrive. Here, we have a child whose trajectory could have been completely different. With the lack of responsiveness the patient showed at the start, it is possible that, without Chiropractic care, she may not have been able to adapt and function at her best. Whether or not she could regain age-appropriate function cannot be guaranteed. What we know is this has had a profound impact on her life and development for years to come.

These improvements were achieved through chiropractic adjustments and with the dedicated mother including at-home stimulation and tummy time activities. The significance of this in the life of this child under care is remarkable. However, the broader implications of the results of this care plan that could be further studied and replicated are immense.

> If all children who were delayed, and non-responsive could have access to care, could Chiropractic assist in arresting poor health and development?

The mechanisms behind this improvement may involve birth trauma, maternal stress and other factors depleting the nervous system of its most vital need - connection and communication.

Conclusion

While the impact of Chiropractic care on developmental milestones and retained primitive reflexes may be well represented in the anecdotal experiences of Chiropractors, it is important that we uncover what this means more broadly. It is vital that we investigate cortical connectivity in infants with low tone and retained primitive reflexes so that we may understand more fully how we can support infant neurodevelopment. In this case, we activated the cortex diligently with adjustments and exercises, and this infant caught up to her peers (within 4 months of care).

This warrants further investigation so we may elucidate what this means for infant development more broadly.

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*Jiggle pops are light, deep, firm, stretches and jiggles, using lots of different simulations to activate the different afferent fibres to send messages to the right brain.

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About the Chiropractor

Dr Jacey Pryjma obtained her Bachelor of Chiropractic Science in 2005, and later her Master of Chiropractic in 2007, from Macquarie University. Jacey founded *Well Kids* in 2013, developing the *Well Kids Program*, and is now the Director of the Australian Children's Chiropractic Centre in New South Wales, Australia

About the Case Report project

This Case Report is a part of the ASRF Case Report Project 2021, a project designed to gather client studies from chiropractors and transform them into much-needed case reports, focused on the effects of chiropractic care on clinical presentations highly relevant to chiropractic, such as stress, immunity and adaptability. This project was made possible by the generous fundraising and contributions of ASRF supporters.