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ASRF CASE REPORT PROJECT

Improvement in movement, function, primitive reflexes and digestion in a 4-month-old female concomitant with Chiropractic care: A case report

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Background: A 12-week-old female was presented for Chiropractic care with parents listing primary concerns of screaming during tummy time, difficulty lifting her head, and exhibiting no arm weight-bearing ability. Further examination revealed difficulties with digestion, a significant head tilt resulting in flat spots (plagiocephaly) on the rear of the head, and excessive gagging while sleeping.

Management: The infant was placed on a care plan where she was seen twice a week for three weeks, and then a further two sessions. During this time she was cared for using spinal adjusting, cranial and palate adjusting, as well as peripheral adjusting for shoulder dysfunction. All methods were modified appropriately for the infant's stage of development.

Outcomes: Significant improvements were noted across all areas of concern, and the infant was able to clear her milestones whereas she had been lagging behind prior to care. This case report illustrates the potential for chiropractic to support developmental milestones by integrating primitive reflexes, supporting the development of the cervical curve, and allowing the nervous system to better adapt to issues like feeding, sleeping and overall well-being.

Conclusion: Basic science has bedded down the importance of tummy time in cervical curve development, and chiropractic case report data has often indicated improvements in mood and digestion, this case report provides a rationale for further research into retained primitive reflexes under chiropractic care.

Indexing Terms: Chiropractic; Subluxation; infant care; adaptability; sleep; mood.

Introduction

A prominent theme in Chiropractic literature is the effect Chiropractic care can have on musculoskeletal and pain presentations. A subset of these studies is similar to presentations in children.

One of the most common reasons for infants to be brought to a Chiropractor is for difficulty with tummy time, low muscle tone, and torticollis. In recent years a new approach to these cases has emerged, now the focus is not limited to the changes in torticollis and poor muscle tone

> *... Expert Chiropractic care can and does have a powerful effect in infants for optimising neuro-developmental and well-being concerns ...'*

symptoms but also considers improvements in feeding and digestion, posture, developmental delay, and sleep. (1, 2, 3)

While tummy time is inextricably linked with muscle tone and the development of the cervical curve as the infant begins to lift the head (and later on, crawl), issues such as shoulder torticollis may complicate or delay this crucial stage of development. (4)

Though this is well understood in paediatric Chiropractic practice and theory, the issue of retained primitive reflexes is emerging as an issue to consider in more depth. Research indicates that retained primitive reflexes, such as the Moro (startle) and Galant reflexes may later be linked to ADHD in childhood, or motor problems and learning disorders in otherwise healthy preschool and school children. (5, 6, 7) While a certain outcome for a child cannot be plotted for an infant under Chiropractic care, research does indicate that proper integration of these primitive reflexes may be vital in ongoing neurodevelopment and gross motor skills and thus warrants a chiropractor's full attention.

The current case details the care plan and outcomes of a 12-week-old female experiencing difficulties with tummy time, poor muscle tone, and suboptimal digestion. This report adds to the growing body of evidence suggesting age-appropriate Chiropractic care, in conjunction with minor additional care recommendations, may benefit infants with poor muscle tone and increase general physical resilience. Additionally, as this article covers subluxation-based care for the infant, it should be noted that the *Australian Spinal Research Foundation's* definition of subluxation is '*a diminished state of being, comprising of a state of reduced coherence, altered biomechanical function, altered neurological function and altered adaptability*'.

Case details

A twelve-week-old baby was presented to a Chiropractic paediatric practice for assessment and care. The infant was reported to have a strong dislike of tummy time including screaming whenever prone, showing difficulty lifting her head (Figs: upper) and exhibiting no arm weight-bearing ability. This had been ongoing since birth. The mother reported that she was otherwise a very happy and settled baby.

During assessment the infant was also showing secondary complaints including explosive bowel movements, '*random gagging*' during sleep when lying supine, and a preference for being held upright when awake.

Parental and child medical history

This was the first time the infant had been seen by a Chiropractor. Additionally, she was the couple's firstborn child, who reported no difficulty conceiving. The mother suffered from *Hyperemesis Gravidarum* during pregnancy and was in bed and vomiting every day until labour. While the mother reported good maternal mental health, she was on limited food intake for months and was hospitalised for IV infusion '*a few times*' during the pregnancy.

This was in addition to the anti-emetic medication she was taking, and it was reported that by approximately 17 weeks, her primary care team had found a satisfactory method to reduce vomiting.

The mother lost 8 kg in the first six weeks and then plateaued for the remainder of the pregnancy. She did report maternal stress with part-time work in the family business, and managing renovations of their home (which also occurred during the pregnancy). She undertook limited exercise due to sickness, whereas prior to pregnancy, she would exercise five or six times a week. Paternal health and well-being were reported as being '*Good*'.

Spontaneous labour occurred at 41+ (1/40). The mother transitioned at home until her waters broke and she started pushing. She was then taken to hospital and pushed there for about an hour

and a half. An episiotomy was required to deliver the infant's head, as it was jamming in the hymenal ring, but was delivered on the following contraction, followed by a final contraction to deliver the body. The mother walked out of the hospital to go home four hours later, despite the stitching required. A pelvic floor injury was sustained and maternal physiotherapy appointments were required post-birth. At the 12-week mark, the mother was still not cleared for exercise.

At the time of delivery, the infant had mild jaundice which resolved without intervention. Swelling around the eyes was present at birth, as well as mild cone shaping to the head. Breastfeeding was reported as having been excellent from the beginning. However, oral thrush was present at birth and the infant was given *Nilstat* at two weeks old, at which point it was resolved.

A strawberry haemangioma is present on the lower right thigh, somewhat increasing in size with temperature (heat). The General Practitioner's advice was to monitor and expect it to self-resolve.

The infant's bowel movements were reported as being explosive, even moving up the back and through clothes. She frequently exhibited symptoms related to wind pain and grunted excessively over the first few months of life. No reflux or vomiting was present. At the time of presentation, the mother was vegetarian (and breastfeeding) but had cut out dairy and soy for one month.

Upon presentation, the infant was placed on a care plan comprising two visits a week for three weeks followed by a review.

The immediate goal was to support the child's brain and body with adjustments to improve cranial, neck and shoulder function, postural alignment, and increase muscle tone to age-appropriate levels for optimal neurodevelopment. The Chiropractor also aimed to see greater vagal tone for better gut function.

Clinical findings

Exam #1

At the first visit, the Chiropractor the intake examination revealed the following:

Joint & bone

The patient had cranial restrictions throughout her head mainly on the left, with moulding over the left squamous suture. There was a Plagiocephaly Index of 7mm with flattening at the right back of the head due to the right-sided head 'nod' and tilt when on her back. Spinal range of motion (ROM) was moderately reduced in the neck across most ranges, particularly in the left-side bend. Flexion and right rotation were reduced in the upper and lower back. Sacral extension was also limited. The left shoulder, elbow and wrist were restricted and the right shoulder was hypermobile.

Nerve & muscle

Areas of subluxation were noted at: The Right Posterior occiput, Right C1, T2, T8, L2, and S2. The patient's cranial nerve tests showed a heightened gag reflex (L>R side). There was a thick lip tie, mild anterior tongue tie and a Left buccal tie. Muscle tone tests showed good ventral suspension (extension tone when held in the 'Superman' position), but notably reduced function in tummy time with spinal and shoulder tone, and reduced flexion tone. Shoulder stability and tone were notably reduced, and worse on the left side. Hip tone was normal, as were muscle reflexes overall with a reduction only noted at the ankles.

Global Posture assessment revealed that the patient had a right head tilt when supine and a strong left head tilt and right head rotation when prone or upright. There was left concave dural pulling when prone on her tummy with left shoulder and right pelvic tilting seen. Prone extension showed notably reduced head lift and poor shoulder weight bearing. (Red arrows on the film

below are what chiropractors prefer to see at 3 months old.) The cranial image showed flattening at the right back of the head.

Brain function

The patient had reduced plantar grasp reflexes and asymmetry with the Babinski reflex. The breast crawl reflex was strong and the left spinal galant reflex was very strong. Early gross motor tests showed reduced extension and flexion tone and poor shoulder function.

At the second examination, following the six-week course of care, significant positive changes were found.

Exam #2

Joint & bone

The patient's cranial bones were moving with greater ease, with only mild restriction through the top and left side of the head. There had been a softening of the strong ridge on the left side of the head and an increase in temporal/squamous shaping/ridge on the right. Spinal ROM had improved well throughout the spine.

Mild restriction remained at the left neck and right upper and lower back. The patient's left shoulder and elbow continued to be restricted while the right shoulder was still hypermobile.

Nerve & muscle

Subluxations were noted at the left posterior occiput and left C1 (a shift from the right early on), as well as at T8, T12, and L4. The patient's cranial nerves were all firing well with gagging now appropriately located. However, her lateral tongue movement to the left was reduced and ties at the lip, tongue and left buccal were still evident. Muscle tone tests showed age-appropriate extension tone, mildly reduced flexion tone and moderate reduction in shoulder tone on both sides. Muscle reflexes continued to fire well overall.

Global Posture assessment revealed that the patient had a persistent right head tilt and as she grew there was more of a right flexion/'nod' to the tilt too (yellow arrow). There was also a mild right shoulder tilt while supine and prone. Tummy time posture was now age-appropriate however the right head tilt was noted during tummy time. Cranial imaging showed improved rounding out at the right back of the head with only subtle asymmetry noted now.

Brain function

The patient's primitive reflexes at the feet had normalised. There was still some immaturity noted with breast crawl remaining mildly persistent. The Galant reflex remained present moderately on both sides (whereas previously it was very strong only on the left).

Postural reflexes tested at 4mo showed present amphibian reflexes and some signs of neck righting starting to fire when the patient was moved seated sideways slowly. Gross motor tests showed excellent improvement to extension tone and some work to do on flexion and shoulder tone, but improvements here were significant compared to the initial assessment.

Subluxation findings

At examination number one: right posterior occiput, right C1, T2, T8, L2, S2

At examination number two: left posterior occiput and left C1 (a shift from the right early on), T8, T12, L4.

Management

Measures

The '*Well Kids Examination Form*' was used at the initial consultation and review with comprehensive structural, musculoskeletal and neurological testing including neurodevelopment

assessment. A parental questionnaire including quality of life assessments was included on the initial consultation form and the review form.

Parent verbal feedback on subjective progress was given at all stages and is discussed below.

Technique and protocol

The Diversified technique, modified to be age-appropriate for an infant, was used in combination with the sacro-occipital approach. This was delivered with age-appropriate adjusting techniques with hands and tools such as activator and peripheral drop pieces.

Occiput and C1 subluxation adjusting was undertaken in addition to shoulder and peripheral adjusting, cranial and palate adjusting, and spinal adjusting.

Additional care recommendations

Given the infant's age and development, a number of additional care recommendations were given to support health, well-being and development. This included shoulder protection to stabilise the infant. This was achieved by lifting, passing, and transferring with a 'scoop and lift' position, whereby one hand was placed under the bottom and the other under the upper back and supporting the neck where necessary. By avoiding lifting under the shoulders, caregivers can help reduce stress on the shoulders and help the adjustments hold.

Supported tummy time variations were also advised, again, always holding the arms underneath the child as discussed above. This was to be supported with lots of 'Baby Carry' or 'Football hold' positions, mostly in the carrier's right arm.

Over the coming weeks, when the appropriate age and tensile strength had been reached, the infant was assisted using the 'pull to sit flexion' exercise. This occurs when, from a seated position, the caregiver very slowly lowers the baby backwards while holding their arms. This allows them to hold the flexion tension in their arms and their torso with a focus on keeping the chin tucked. Then once the infant reaches their limit, before they extend, slowly bring them back to the seated position. Play the 'rock your boat 'game gently and slowly until the point of fatigue.

A tummy time workshop was recommended as were *Qiara Infant Probiotic* drops (daily).

Outcomes

The review was scheduled following seven adjustments at a frequency of twice weekly for three weeks then weekly. The review was on the eighth visit. This included the adjustment provided at the Initial Consultation.

The child had improved remarkably well with tummy time settledness and function. Her head lift improved within three to four adjustments (Figs: lower) and the family commented on the difference. Her shoulders still required a little support to maintain weight bearing however overall tummy time function was significantly improved. There was some persistence in right head tilt and some reduction in shoulder tone and stability. However, notable improvements in left arm joint movement, tenderness and function were recognised.

There was still some persistent gagging during sleep, with no reflux or vomiting accompanying the episodes which had reduced despite not resolving completely. She was sleeping with her mouth open, however, her tongue seems to be in a better position in the palate, which may indicate an improvement in the tongue tie. The Chiropractor continued to monitor the frequency of this sleep gagging (as there was a query as to whether apnoea was a factor) to determine whether frenectomy intervention was required.

Her parents noted that her neck ROM was better on both sides when sleeping. Movement was reported as being much better when awake (active). The patient would now look to the left in tummy time much more and her left arm was less stiff.

Additionally, the child was doing far better in her tummy time, which was non-existent prior to care because she would scream. The extended family was now noticing her neck strength improving and she seemed happy to be placed on her tummy multiple times daily.

Improvements noted included:

- Muscle tone
- Freedom of movement/relaxed body
- More active movement/strength
- Achieving certain milestones
- Tummy distension/bloating/excessive wind

The patient's parents were very happy with the progress and quick improvements noted in their child's movement, function and settledness during tummy time.

The Chiropractor noted that the patient's motor tone, spinal and peripheral joint function and somatosensory development had considerably improved with the provision of Chiropractic care. The mother noted at the initial consultation that the infant was well behind her peers with tummy time ability and this was echoed in clinical findings found by the Chiropractor. The changes whilst under care mean the child is now much improved and closer to age-appropriate with neurodevelopment and a period of continued care will likely see further normalisation and optimisation of neurodevelopment.

The child's gut function also improved well during the course of the care plan, despite the need for continued monitoring of the sleep gagging.

The mother was much happier and less anxious putting her baby in tummy time. She was very pleased to be meeting the recommendations of 20+ minutes per day of tummy time for her child's age, without the stress, anxiety and overwhelm that comes with a crying baby (who is otherwise happy). The mother felt she could now do the right thing for her baby to help her development without the distress that was previously occurring.

Discussion

This case report details the improvements in muscle tone, digestion, and overall adaptability in a 4-month-old child. Chiropractic care was the only mode of treatment or change provided to the child during the four weeks preceding the review. As such, Chiropractic care and the additional home care recommendations were likely the sole reason this child's primary and secondary concerns improved. While four weeks had elapsed during that time, the comparative progress made against expected milestones provided a good reference point by which to measure the progress observed by parents and chiropractors alike.

Tummy time difficulties are a common concern for parents of children with sub-optimal muscle tone or torticollis. Previous studies have identified improvements in muscle tone in patients recovering from stroke and children diagnosed with cerebral palsy, following subluxation-based Chiropractic care. (8, 9) While the exact mechanism by which these effects are achieved remains elusive, it may be connected to the increase in muscle tone and strength following Chiropractic care, identified in Christiansen et al's work on strength and cortical drive post-chiropractic adjustments. (1) While this has only been studied using a sample of athletes, further studies may confirm this effect across other ages.

This case highlights the broad benefits Chiropractic care can have for individuals beyond 'back pain'. As we work with optimising nervous system function through Chiropractic care a person's (young or old) resilience and adaptability can and does improve. This case is evidence of the

profound impact Chiropractic care can and does have on optimising neurodevelopmental well-being concerns beyond spinal 'pain'.

Conclusion

While basic science has bedded down the importance of tummy time in cervical curve development, and Chiropractic case report data has often indicated improvements in mood and digestion, this case report provides a rationale for further research into retained primitive reflexes under chiropractic care, and larger studies confirming resolution of shoulder torticollis, digestion or mood in infants under Chiropractic care.

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References

1. Alacntara, J., & Green, S. (2019). Resolution of Torticollis, Breastfeeding Difficulties & Cranial Distortion in a Twin Infant Undergoing Chiropractic Care for Vertebral Subluxation: A Case Report & Review of the Literature. J Pediatr Matern & Fam Health - Chiroprl:78-81
2. Hobaek Siegenthaler, M. (2017). Unresolved Congenital Torticollis and Its Consequences: A Report of 2 Cases. Journal of Chiropractic Medicine, 16(3), 257–261.
3. Istok, M., & Rubin, D. (2013). Resolution of Infantile Colic, Torticollis, Plagiocephaly & Feeding Difficulties Following Subluxation Based Chiropractic: A Case Report. J Pediatr Matern & Fam Health - Chiropr. (2):24-27
4. Rosen, M (2021). Tummy Time - A Crucial Neurodevelopmental Process. Journal of the American Laser Study Club. Mar 2021. Vol 4. Iss 1 https://drmartinrosen.com/wp-content/uploads/2023/04/JALSC-Tummy-Time.pdf
5. Bob, P., & Konicarova, J. (2012) Retained Primitive Reflexes and ADHD in Children. ***Act Nerv Super*** 54, 135–138 (2012). https://doi.org/10.1007/BF03379591
6. Choinska, A., Gieysztor, E., & Paprocka-Borowicz, M., (2015). Persistence of primitive reflexes and associated motor problems in healthy preschool children. Arch Med Sci, 2018; 14:1: pp 167-173
7. O'Reilly, M.F., Roche, L., & Sigafoos, J. (2021) Persistence of Primitive Reflexes in Developmental Disorders. Curr Dev Disord Rep 8, 98–105. https://doi.org/10.1007/s40474-021-00232-2
8. Ling, CW. (2023). Changes in gait parameters, muscle tone, and radiographic parameters in post-ischemic stroke patients following Chiropractic care. Asia-Pac Chiropr J. 3.4. URL apcj.net/Papers-Issue-3-4/#LingGait

9. Kent, C., McCoy, M., Malakhova, E., Safronov, Y., Scire, P. (2006). Improvement in paraspinal muscle tone, autonomic function and quality of life in four children with cerebral palsy undergoing subluxation based Chiropractic care: Four retrospective case studies and review of the literature. J Vert Sublux Res. 1-15

10. Allen, K., Christiansen, T.L., Duehr, J., Haavik, H., Hartvigsen, J., Holt, K., Marshall, P., Niazi, I.K., Nedergaard, R.W., & Türker, K.S. (2018) The effects of a single session of spinal manipulation on strength and cortical drive in athletes. Eur. J. Appl. Physiol. 2018. 118;737–749

About the Chiropractor

Dr Amanda Watson is a passionate Chiropractor specialising in paediatric care. Her focus is on understanding children's bodily functions and nervous system development. In 2015, she founded *Empowering Mums*, an education-based business providing parents with tools to help their children thrive. Amanda has focused her post-graduate training on paediatric chiropractic. She is currently completing her Diplomate of Chiropractic Paediatric Neurodevelopment.

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.

Images

Figs: Neck extension. On entrance (above), after 1 month of care (below)