

Improvement in adaptability concomitant with paediatric chiropractic care: A series of 5 cases

Nik Dukovac, Ruth Postlethwaite and Clare McIvor

Abstract: *Objective/Clinical Features:* Four cases addressing chiropractic care and sleep, energy and behaviour are presented, with diversified technique as the primary method of reducing subluxations.

Intervention/Outcome: Subluxation-based care was delivered via diversified technique with care plans tailored to meet parent and chiropractor recommendations.

Conclusion: Chiropractic care for the reduction of subluxations may contribute to enhanced nervous system coherence, thus allowing the child to better adapt to their environment, resulting in better sleep and behaviour. In terms of the research agenda of the ASRF these cases demonstrate an improvement in patient adaptability seems associated with subluxation correction. Further research is required to understand the mechanisms behind these improvements.

Indexing Terms: Chiropractic; Subluxation; breastfeeding; case report; case series; adaptability

Introduction

A dysfunctional nervous system can manifest in a variety of complaints, far beyond the well-documented bounds of spinal discomfort and misalignment. While these behavioural and emotional manifestations are evident in the adult population, they are particularly obvious in paediatric cases. Studies reporting the potential positive effects of chiropractic care for sleep and mood issues in children are beginning to emerge.

Attention Deficit Hyperactivity Disorder (ADHD) is a common behavioural disorder seen in children. It is characterised by inattention, impulsivity, and difficulties with behaviour and emotion. (1) This is challenging for both the child and the family, with medication being the primary management method. There are previous cases noting improvements in ADHD and violent outbreaks in kids. (2, 3)

Often observed alongside behavioural concerns are difficulties with sleep. These can include difficulty falling asleep, staying asleep, reduced quality of sleep, and may be attributed to both structural and non-structural causes. It is not a leap to

... these case reports raise the possibility that the restoration of ease to the nervous system may be associated with restoration of the child to a state in which they can better adapt to their environment'



consider that reducing physical stress on the nervous system with chiropractic care would support a higher quality of sleep. There is an interesting case study reporting the resolution of symptoms associated with obstructive sleep apnea since commencing chiropractic care. (4) Although this case followed the effects of chiropractic care in an adult, it highlights the potential for chiropractic adjustment to improve a broad range of sleep complaints and lays the foundation for the paediatric cases now emerging, highlighting improvements in sleep as a positive correlation with chiropractic care.

Improvements in sleep and behaviour are often reported to occur in unison following chiropractic care. While usually noted as secondary outcomes, they have been gaining attention.

Another case reported improved sleep as a secondary outcome to addressing sleep bruxism alongside the primary focus which was the migraine and chronic sinus congestion. (5) While again, an adult was the focus of the case report it stands to reason that a younger, more sensitive nervous system may benefit from similar care tailored to the age and tensile strength of the patient.

The following case series focuses on paediatric presentations for chiropractic care where the primary presenting complaint involved sleep or mood, and where subluxation-based care was concomitant with improvements in said complaints.

Case 1: Behavioural Change

Patient details

An 8y male presented for care with a chief complaint of uneven shoulders and one foot that turned out when standing. Medical history included having his tonsils and adenoids removed three years prior. Other than that, his medical history was unremarkable (including the fact that he was born via an uncomplicated vaginal birth).

Examination

Upon presentation at a chiropractic clinic an examination was conducted which revealed vertebral subluxations graded as severe at C1 and C2 bilaterally, and moderate at C6, T2, T3, T4 (bilaterally), C5 and T9-12 on the right, and L4, L5 and sacroiliac on the left. A battery of tests were undertaken to ascertain the child's state of function, posture, muscle tone and more. Of significance were the following clinical findings:

- Full cervical spine range of motion
- Posture feet: valgus
- Posture knees: valgus
- Posture spinal: Left shoulder down
- Posture head carriage: forward
- Hip external rotation in flexion: bilaterally equal
- *Patrick Fabere*: within normal limits bilaterally
- General full body poor muscle tone
 - It was also observed that, when pulling himself up to sitting position from a supine position, the patient did so with hands clenched on his shorts to pull himself up.
- Oral Examination:
 - Very high palate
 - Open Mouth Tongue ROM was 80% elevation.
- Observed natural breathing through nose with lips sealed.

- Fakuda's marching test revealed no rotation, but he was moderately uncoordinated

Management

Following the initial examination the patient was placed on a four-week course of care of two visits per week (8 care sessions). The major goals of care included improving his posture including reducing asymmetrical shoulders, as well as improving muscle tone and coordination.

The patient was adjusted using diversified chiropractic techniques appropriate for the child's age, size and tensile strength. Adjustments were performed correct the primary subluxations found in examination; including: C1, C2, T9 posterior to anterior, and left sacral base. His home-care schedule included spending time on his stomach and extending his head (similar to tummy time performed as an infant). The purpose of this was to improve his general extensor postural muscle tone.

Following review there was a revised schedule of care at one session per week for eight weeks visits then another reassessment. Rather than being set at the beginning of care, the care plans (i.e. frequency and duration of care) were agreed upon by chiropractor and parent given the presenting characteristics of the patient, the progress, and the review status as well as parent input.

Outcomes

At the first review session following four weeks (8 sessions) of care, the patient's vertebral subluxation findings were notably improved. He now had only moderate spinal tension bilaterally at C1, C2 and T4, and at the sacroiliac on the left. At T3 and T5 bilaterally as well as L5 and C5 on the left, vertebral subluxations were now only mild.

All of his postural concerns had resolved.

The patient's muscle tone had improved moderately and he was able to sit up from supine without pulling on his pants for aid, however still not easy for him.

While the original concerns listed at presentation did not include behavioural issues, it was noted at this first follow up that both parents and teachers had noticed and commended on improvement in his behaviour. He was now less grumpy, more attentive and generally calmer. At school, he could now sit still during floor time (whereas this had been a significant difficulty prior to care). His FAKUDA results were still mildly poor but had improved significantly since the intake appointment. His mother was 'very happy' with his progress.

Case 2: Sleep quality

Patient details

A four-and-a-half month old male presented for care with primary concerns including difficulty with sleeping, including excessive movement particularly at night. While the mother reported that her infant was breastfeeding 'okay', parents noticed he was sleeping with his mouth open at night which potentially indicated mouth-breathing, and he didn't like tummy time and could only last between one and two minutes at maximum. Parents noted that these difficulties had only emerged over the previous month (since age three-and-a-half months).

History and Examination

Upon presentation the examination and case history revealed that the infant was born via induced labour at 37 weeks gestation due to maternal pre-eclampsia.

Upon examination, it was found that the infant had vertebral subluxations at C1 bilaterally and at C2 on the right rated as severe, as well as moderate spinal tension at C2 on the left. He was diagnosed with a vertebral subluxation complex.

It was also found through palpation of intra-oral tissues that the child had no physical tongue restriction visible to limit elevation, however there was significant muscle hypertonicity of the intra-oral musculature at the floor of the mouth (the *mylohyoid* muscle).

Management

Following these findings, the infant was placed on an initial care plan of two sessions per week for four weeks, totalling eight sessions followed by a re-evaluation. This was followed by three more care plans at reducing frequencies, which were not pre-destined. Each plan was generated by the chiropractor and parents given the presenting characteristics of the patient, the progress, and the review status as well as any parent input.

Across all care plans, tummy time and oral soft tissue therapy (STT) (namely to massage the floor of the mouth intra-orally) were recommended as home-care support. Adjustments by sustained contact technique were performed to: C1 right bilaterally (C3 left, C1 left, C2 right, T4, and right Sacroiliac was included during fourth care plan) as well as Dural balance and cranial work as taught by *Inspiral Resources Australia*.

During the 3rd care plan the mother wanted to stretch visits out to every three weeks. The mother was also advised by the chiropractor to take sauerkraut and Himalayan salt in order to assist with gut health. Towards the end of the 3rd care plan it was noted that the child had a few falls off the bed. By this stage, he was nearing one year old and was in his mother's words '*quite a rough and tumble boy*'. She decided to keep him under care for this reason, and to continue to support his spinal health ongoing as he developed.

Outcomes

At the first review, vertebral subluxations had reduced from a grading of severe to moderate at C1 on both sides and C2 on the right. This grade of subluxation at these locations decreased to mild by the second review. At the third review, post-falling off the bed, he had mild vertebral subluxation at C2 and sacroiliac on the right, C3 on the left, and T5 on both sides.

Within just a few sessions the mother remarked that his sleep and settledness had drastically improved at night and she was in '*tears of happiness*' over this. Overall, she was very happy with his progress.

At the second review, she was still very happy with his progress. He was '*way more settled*' and waking every three hours at night on average, a significant improvement on his pre-care presentation (waking every hour or less). Mother also reported that her child's mouth was most often closed when sleeping now.

At the third review, the mother was still very happy with progress, however she wished to continue under care to support vertebral subluxations relief '*due to him being a rough and tumble little boy*'.

Case 3: Excessive Tiredness

Patient details

A 16y patient presented for chiropractic care, with primary complaints of neck soreness, excessive tiredness in recent times and general vertebral subluxations. She had been under chiropractic care prior to this presentation, and had returned following a GP diagnosis of hypothyroidism, low iron and low vitamin D (diagnosed via blood test).

Examination

Upon this new presentation for chiropractic care, the history and examination included a review of blood test results.

Notable vertebral subluxation findings included vertebral subluxations rated as severe at C1 and C2 on both sides, moderate at T2-4, and at L4-S1 on the left side. C5, C6 and T10 were mild on both sides, and T2-T4 and L4-L5 were mild on the right. Previous x-rays showed the cervical spine to be alordotic, while the thoracic and lumbar spines were within normal limits and showed good alignment. X-rays did reveal observation of an old coccyx dislocation anteriorly.

A diagnosis of hypothyroidism from GP blood tests was confirmed, and the chiropractor added a diagnosis of vertebral subluxation complex.

Management

The patient then began a care plan of one session per week for twelve weeks followed by a reassessment. However, sometimes, appointments were two weeks apart due to school commitments. At the end of the care plan a scheduled progress assessment was conducted.

Adjustments were delivered via diversified technique to LSI T4, C1RP, C2LP.

Dietary advice was given to cut out all sugar and refined grains. Also, it was recommended that she commence supplementing with 5000 IU's of Vitamin D3 daily, Fish oil (2 tea spoons), and probiotics.

Outcomes

At her progress review after eight sessions, vertebral subluxations had reduced to moderate spinal tension at C2 on the right, mild on the left and sacroiliac mild on the right. C1, T4, T5 L1 and L2 were mild on both sides.

She reported that she did not follow any of the chiropractor's dietary advice and continued with her normal eating habits.

Over the continued course of care, her energy levels continually improved, which was met with an improvement in thyroid hormone levels measured by blood test at the seven-week mark. The patient was able to avoid diagnosis of an autoimmune thyroid condition, which was a significant clinical outcome. Another significant outcome was that, at the beginning of care, she was GP-diagnosed with hypothyroidism, and after a course of chiropractic care, no longer met the clinical criteria for the condition.

Case 4: Behaviour

Patient details

A 4½y male presented for care with parents citing primary concerns of behavioural issues, sleep issues and wondering if spinal health or tension could be contributing to his 'mood swings'. At the time of presentation, the child would have emotional 'meltdowns' where he would burst into tears and become inconsolable. He would become so heightened that the mother would be unable to restore him to a calm state. This would happen at least once, but up to three times daily. While he slept well at night, parents noted that he snored and was a mouth breather.

Prior to presenting for chiropractic care, the mother had tried parenting courses to help with his behaviour without success. Parents had also consulted occupational therapists for help.

Examination

A chiropractic history and examination confirmed the mouth-breathing issue and revealed vertebral subluxations rated as severe at C1 on both sides and at C2 on the right. He also had medium vertebral subluxations at T3, T4, and L1 on both sides as well as C2 on the left and sacroiliac on the right.

He was subsequently diagnosed with a vertebral subluxation complex and placed on a care plan that both parents and chiropractor agreed to for good results of subluxation reduction.

Management

The patient's chiropractic management plan began with one session per week for eight weeks followed by reassessment. The goals of care were to improve spinal health, both in terms of function and comfort, and by extension intend for the reduced physical stress on his nervous system to improve his emotional adaptability. The child was adjusted using age-appropriate diversified technique, with specific focuses on C1, C2, T3, T4, L1 and the sacroiliac joint. No home-care instructions were given.

After the first review, the care plan was revised to one session every two weeks for eight visits followed by a reassessment.

Outcomes

From the second visit, the mother noticed that his behaviour had improved somewhat. By the fourth visit, she reported that his behaviour was significantly better since the beginning of care. At review the parents reported they were very happy with progress and behaviour had been '*so much better*'.

He continued to be a mouth breather.

These parent reported findings were consistent with a significant reduction in vertebral subluxation findings, with vertebral subluxations now graded as moderate at T9 bilaterally and C1 and C2 on the right. It was mild at T3 bilaterally, and C2, C5 and sacroiliac on the left.

Concomitant with chiropractic care the 'meltdowns' stopped happening all together. Parents noted that he has become much calmer, better focused, and rarely became upset over trivial things. When he did, he was much easier to console.

Case 5: Poor Sleep

Patient details

A ten-month-old male patient presented for care with a primary concern of a lip tie that had been present from birth. He was unsettled at night with parents noting he was a very light sleeper who was easily disturbed and moved a lot in his sleep.

History and Examination

Upon initial presentation to a chiropractic clinic it was recorded that he was born via emergency C-section birth due to labour failing to progress.

Range of motion in the cervical spine was notably decreased on both sides by 25%. Intra-oral palpation revealed moderate hypertonic muscles in the floor of the mouth (*mylohyoid* muscle), while the *buccinators* were within normal limits. Connective tissue bands were visualised at the upper lip and under the tongue but the former did not demonstrate restriction of passive mobility of the upper lip and the latter did demonstrate mild to moderate restriction of passive tongue elevation.

An examination of his spine revealed severe vertebral subluxation at C1 on both sides and mild vertebral subluxations at the sacroiliac joint on the right. He was diagnosed with a vertebral subluxation complex and placed on a course of chiropractic care.

Management

The initial care plan comprised two sessions per week for eight visits followed by a reassessment. Adjustments were performed to all subluxations using gentle sustained contact technique in the direction to reduce all noted vertebral subluxations. Dural balance and cranial tension were addressed using techniques taught in seminars by *Inspirial Resources Australia*. Oral soft tissue therapy (STT), was performed with gentle massage of hypertonic oral muscles. The home-care recommendations included continuing with tummy time and including oral STT.

Following the first progress review, his care plan was revised to one session every one-two weeks for six visits followed by a reassessment. The same care methodology was followed.

The frequency of care for each phase of care was agreed upon with parents on reviewing the results of the most recent exam findings of severity of vertebral subluxations. They were not pre-determined from the initial assessment report.

Outcomes

At the first review vertebral subluxations had reduced to mild at T7 bilaterally and at C1 bilaterally. This reduction in vertebral subluxations coincided with a decrease in night wakefulness, with parents remarking that he was now only waking once per night on average, and was staying still while sleeping rather than constantly moving as he was at first presentation.

It is also worth noting that by the second visit the parents reported longer naps during the day, and remarked that the infant was almost always sleeping with his mouth closed (whereas previously he had been a mouth breather).

At the second review, the patient's vertebral subluxations had now reduced to mild at C2 on the left. At this point, parents were very happy with his progress and as his sleep was now '*great*', they opted for self-directed, symptomatic care.

Discussion

While it might not be top of mind for a parent to present their child for care at a chiropractic clinic with primary concerns of poor sleep, fatigue or with behavioural concerns, these case reports do raise the possibility that the restoration of ease to the nervous system may be associated with restoration of the child to a state in which they can better adapt to their environment. Further research is required to understand how this might impact the specific neuro-biomechanical pathways contributing to sleep or behaviour.

Clare McIvor
BBus(Admin),
GD Comms(ProfWrit,Edit),
GD(Psych)(Cand)
Writer, ASRF

Ruth Postlethwaite
BBiomedSc
Writer, ASRF

Nic M Dukovac
BSc, DC
Chiropractor

Cite: Dukovac N, Postlethwaite R, McIvor C. Improvement in adaptability concomitant with paediatric chiropractic care: A series of 5 cases. *Asia-Pac Chiropr J.* 2022;3.2. URL apcj.net/Papers-Issue-3-2/#DukovacAdaptability

About

Nik Dukovac is a chiropractor, co-owner of Better Back Chiropractic and Adelaide Family Chiropractic in South Australia, and Founder of *MotusPro*, an online platform to assist people who have failed to gain confidence with their lower back despite trying various therapies. He is passionate about paediatric chiropractic care. The first person voice in this report is that of Dr Dukovac.

References

1. Magnus W, Nazir S, Anilkumar AC, Shaban K. Attention Deficit Hyperactivity Disorder. 2022 May 8. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2022 Jan. PMID: 28722868.
2. Fairest C & Russell D. Improvement in behavior and attention in a 7-year-old girl with ADHD receiving chiropractic care: A case report and review of the literature. *Journal of Clinical Chiropractic Pediatrics*. 2019. 18(1);1525-1533
3. 2. Cook J. A case report of improved behavior and a reduction in violent outbreaks in a 10-year-old boy with chiropractic care. *Journal of Clinical Chiropractic Pediatrics*. 2014. 14(3);1172-1175.
4. Mankal K & Jenks M. Resolution of Obstructive Sleep Apnea Following Chiropractic Care to Reduce Vertebral Subluxation. *A. Vertebral Subluxation Res*. 2017 Jun. pp. 113-118
5. Laferrière E. Positive chiropractic treatment outcome of migraine without aura in a 6-year-old presenting with sleep bruxism and chronic sinus congestion: a case-report. *Journal of Clinical Chiropractic Pediatrics*. 2016. 15(3);1309-1314

ASRF definition of subluxation

'A vertebral subluxation is a diminished state of being, comprising a state of reduced coherence, altered biomechanical function, altered neurological function and altered adaptability.'

