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Improvement in Muscle Spasticity, Pain and Continence in a 52-year-old Female with Cerebral Palsy: A case report

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Background: A 52-year-old female with cerebral palsy presented for care, seeking assistance with symptoms related to her condition. Muscle spasticity, pain, and continence were all significant issues, and she had found it difficult to find ongoing care with a chiropractor due to concerns over their ability to help manage her condition.

Intervention: The patient commenced a course of care during which she was managed using Advanced Biostructural Correction Technique (ABC™)

Outcomes: While balance, posture and mobility were her initial concerns and thus the primary aims of care, a reduction in pain and incontinence (urinary and faecal) was noted. This contributed to a significant increase in quality of life over time. Following positive results within the initial year of care, she elected to remain under care as a part of her ongoing health management.

Conclusion: Chiropractic care for Cerebral Palsy requires a sensitive and adaptable approach to care. While muscle spasticity and other condition specific mobility issues may present an initial challenge, this case report indicates that positive results can be achieved through subluxation based care over time. Further research into Chiropractic, muscle spasticity and Cerebral Palsy would be beneficial.

Indexing Terms: Chiropractic; Subluxation; Advanced Biostructural Correction Technique; ABC; cerebral palsy; Quality of Life.

Introduction

Cerebral Palsy (CP) is a term used to refer to neurological and physical disorders affecting posture and movement. In most cases, the cluster of impairments occur due to the brain sustaining an injury during development, either during pregnancy, during birth or shortly after. Cerebral palsy is usually diagnosed during infancy or early childhood and is the most common childhood disability, with European statistics indicating that the prevalence of the condition is 2.08% per 1000 live births. (1) At this point in time, these physical disabilities are life-long and there is no cure.

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Alongside motor difficulties, CP can present with learning, hearing, visual, and communication delays or impairments. The type and severity of physical disability and comorbidities vary depending on multiple factors regarding the

injury to the brain. Research has indicated that other conditions such as epilepsy, intellectual disabilities and nutritional problems may also co-occur. (1)

A core symptomatic challenge faced by people living with CP is that of muscle spasticity, wherein muscles become rigid, and reflexes become exaggerated. (1) Initial evidence has suggested that Chiropractic care may be beneficial in relieving symptoms related to CP. In one case series comprising 29 patients and focusing on the wrist flexor, significant improvements were noted after two weeks of Chiropractic care. (2) In this study, spasticity of the wrist flexor was measured using a neuroflexor device designed to calculate the neural component of the muscle tone.

A randomised controlled trial (3) examined muscle spasticity and manual dexterity in CP patients, once again focusing on the wrist muscle, and found that spinal manipulation may assist in reduction of muscle spasticity in the short term. In this case, spinal manipulation was delivered by an orthopaedic medical doctor and not a Chiropractor. Thus, while preliminary evidence suggests at least a short term influence, Chiropractic specific randomised controlled trials do not currently exist, nor have any larger studies elicited the long term benefits of chiropractic care for this patient group.

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This is achieved through multimodal care between medical practitioners and other specialists. With a high prevalence and no cure, it is vital that care modalities that may be effective are explored.

Chiropractic has not yet been explored fully as a bonafide contributor to the care team surrounding CP patients. Neither has Chiropractic been explored as a preventative measure, given maternal prenatal and perinatal health, and birth complications have been highlighted as a risk factor in developing the condition. (1) This being the case, it must be accepted that CP cannot always be prevented and thus supporting the patient and their carers becomes the primary role of the Chiropractor.

The following case report documents the management of a patient with cerebral palsy and the improvement in motor control and independence following a course of Chiropractic care following the Advanced BioStructural Correction™ technique.

Case details

A 52-year-old female presented for Chiropractic care with primary concerns of chronic low back pain, chronic neck and shoulder pain and balance issues. She had a lifelong medical history of Cerebral Palsy leading to disability, and use of a wheelchair. While she was ambulant as a child, she had lost this ability in adulthood. At the time of her presentation, she had been intermittently under Chiropractic care but had experienced difficulty finding a practitioner who was prepared to maintain her care due to lack of confidence in prospective improvements. At the time of her presentation, she had not been under care for several months.

At the time of her presentation, she had very limited movement and was thus dependent on support workers for basic life activities including house chores, getting dressed and toileting. She

was able to communicate verbally with little restriction but required a motorised wheelchair for movement at all times.

A secondary complaint raised by the patient, though she did not originally think it relevant, was that she suffered from incontinence and required daily support to manage it.

Clinical findings

Upon presentation, she underwent an amended Chiropractic examination due to the wheelchair being a limiting factor. Her postural presentation had numerous significant findings including Upper Crossed Syndrome, an increased thoracic kyphosis and corresponding decreased lumbar lordosis. These findings were all assessed in a sitting position in the wheelchair as the patient was unable to stand.

When she was transferred to the supine position on the table, she remained in a rigid kyphotic shape with her thoracic spine restricting her ability to rest her head on the table even while in full cervical extension. Her lumbar spine became hyperkyphotic with severe right lumbar rotation, resulting in the left side of her pelvis lifting off the table and rendering her unable to lay flat.

Contraction of the entire musculoskeletal system was very much in line with her cerebral palsy presentation. Notably, her thoracic and lumbar *erector spinae* muscles were in particular hypertonic.

Movement in the right upper limb was limited, but the patient was able to achieve basic function. She also had limited ability to use the left upper limb with a fixed elbow flexion present.

Only very limited use of bilateral lower limbs was achievable as the patient had fixed contraction of the bilateral hamstrings and calf muscles. She was unable to stand even with assistance.

Photographs were taken of the patient in supine position in order to analyse her posture and to provide comparative evidence later on in her care plan. She was assessed for subluxations using a modified ABC™ protocol to account for her physical limitations. Anterior and lateral meningeal adhesions were noted in the examination, as were subluxations at T4, T6, T12, and L5. Her first ribs were also noted as inferior (anterior), and her plantar tarsal bones required extremity adjusting.

She commenced an initial care plan whereby she was adjusted twice weekly for three months, and was managed using the ABC technique (with modifications due to her condition). In addition to her chiropractic care, her disability support workers were trained by the Chiropractor so that they could achieve better positional management, and so that ergonomic modifications could be made in the patient's immediate environment.

As the patient accessed Chiropractic care due to the Australian National Disability Insurance Scheme (NDIS), progress was monitored carefully so that an ideal care schedule could be identified. In due course, after the initial twice-weekly care schedule, it was noted that symptomatic regression occurred when the patient dropped below weekly visits. While twice weekly remained the ideal schedule, a minimum schedule frequency of once per week was found to be best (NDIS funding dependent)

The initial aims of care were to reduce low back, neck and shoulder pain and improve mobility, posture, balance, and urinary and faecal continence. Balance was thought of as particularly important as stability in the wheelchair and during transfer (using a hoist) had been a challenge in the past. The patient wished to maintain independent living and not be forced into a care facility, which added a significant quality of life element as an important need for this particular patient.

While a re-assessment was performed at every visit, so that adjustments could be delivered appropriately, a major review was undertaken every three months. Due to her limitations, this was mostly verbal, but photographic reviews were also undertaken when appropriate.

Outcomes

After three months of care, the patient noted significant improvements in low back and neck pain. This coincided with improved balance and self-positional management in the wheelchair, commode chair and hoist. This was previously unattainable and marked a significant change for the patient.

> Also remarkable was a 70% improvement in urinary and faecal incontinence. This meant that there was a 70% reduction in the requirement for support workers to change her due to continence issues. This in itself was a significant increase in quality of life.

Objective measures revealed significant postural improvements and improvements in subluxation listings alongside a marked decrease in muscle spasticity. Following the second review, six months into her care regime, she reported marked and continual improvements in muscle spasms, pain, balance, mobility, and the ability to self-manage her body.

The patient was now able to lay more flat and supine on table with flexion contracture directly correlated with decreased pain and continence improvement. The patient considered these improvements to be '*life-changing*' and is advocating for ongoing support from NDIS to maintain these changes. While the initial course of care was six months, she has now extended her engagement with Chiropractic care over a course of years.

An observation made over her course of care was that care frequency was vital. If she was unable to keep a regular schedule, slow regressions would occur. While ordinarily, spacing out care would be ideal following an initial intake and care period, some conditions like Cerebral Palsy may require care frequency to remain stable.

A limitation in this case is that comparative scans were difficult to obtain due to her condition limiting appropriate movement and repetition. Thus, functional outcome measures became the most important measure in this case.

Technique adaptations

The ABC Technique usually requires evaluation in a standing position, however, this was not able to be achieved in this case. Numerous adaptations had to be put in place in order to accommodate the patient. She was able to be transported from the wheelchair to the adjusting table using a hoist operated by the Chiropractor. ABC principles were adapted to assess her in a supine position on the table, and partially in her chair. Anterior and lateral meningeal releases were performed as they would be in a standard protocol, and were done so routinely at every visit. Under normal circumstances under the ABC protocol, these would not be done this regularly. However, her Cerebral Palsy, the inability to test as per normal protocol, and the fact that she responded favourably every time lead the Chiropractor to perform these manoeuvres as part of her regular care regime.

Likewise, vertebral subluxation adjustments are typically performed in a standing position and thus, adjustments had to be adapted and performed supine. To assess where subluxations were present on any given visit, the Chiropractor palpated her thoracic and lumbar spine for areas of

accelerated change in her kyphosis and lordosis indicating subluxation. Adjustments were performed in a supine position in accordance with the ABC protocols.

Adjusting her this way had an immediate and visible impact on her muscle hypertonicity. She would immediately soften her muscle tension, resulting in less thoracic flexion which then resulted in the patient being able to lay flat on the table.

Despite the fact that she did not walk, adjusting her tarsal bones in line with the ABC method would consistently result in a reduction of lumbar rotation. Another indicator of successful adjustments was her ability to sit upright comfortably in her wheelchair at the conclusion of the session.

Discussion

Numerous aspects of this case report warrant consideration, as the ramifications of CP on the patients activities of daily life were many and varied. Core to these considerations, and the patient's quality of life, were improvements in her comfort, ability to self-manage, and thus maintain her independent living status (the latter of which was her ultimate goal). While patients afflicted with CP frequently require assistance in order to undertake activities of daily life such as dressing, toileting, and undertaking tasks involving significant mobility (depending on the level of injury contributing to their CP), practitioners can easily forget that pain is not the only consideration.

In this case, continence was an important area of consideration. A 70% reduction in urinary and faecal incontinence reduced carer requirements in this area significantly. The impact of this single factor is likely to have contributed highly to the patient's quality of life. The mechanisms behind this remain unconfirmed by research. However, initial chiropractic evidence has suggested that Chiropractic adjustment impacts pelvic floor function. (4) While this study was focused on pelvic floor function in pregnant and non-pregnant women, specifically in relation to the hiatus hole, which is of particular importance in childbirth, it does raise the possibility that Chiropractic may impact other elements of pelvic floor function. This being the case, and knowing that Chiropractic has been shown to elicit changes that shorten the cortical silent period and impact elements of muscle control in upper and lower limbs, it follows that chiropractic care and continence may warrant further research to examine whether a link exists. (6, 7)

Given that preliminary evidence has indicated Chiropractic intervention impacts sensorimotor integration and has the potential to elicit changes in the cerebellar cortex, the foundational rationale for further studies in areas related to CP symptomatologies already exists. (8)

It is important to note that no other additions to, or subtractions from, the patient's care regime could explain the changes in her symptoms. According to the patient, her improvements are 'undeniably' the result of Chiropractic care. This was confirmed by alterations in her care frequency producing slow regressions in her symptoms.

Conclusion

This case report was limited in that ordinary care would include multiple postural photographs which were not possible due to the patient's condition. Thus, objective measures are somewhat lacking. However, it is clear from the Chiropractor's observation and the patient self-report that the structural changes lead to less full-body muscle spasticity which resulted in decreased pain.

The changes in pain and continence have not yet been fully explained, but it should be considered that structural changes may have reduced pressure placed on the bladder and bowel (when in the contracted position), or that nervous system care and improvement lead to better afferent and efferent input thus affecting function.

Use of the ABC technique was uniquely suited to support this patient. Under the ABC protocols it is routine to adjust anterior to posterior, in the direction the body has less musculature and thus a decreased ability to self-correct. This may have been a significant factor in her response to ABC Chiropractic care.

Given the above considerations, it is reasonable to suggest further research into chiropractic as a modality for improving symptoms of, and quality of life in, Cerebral Palsy patients, as well as examining the link between chiropractic and continence.

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About the Chiropractors

Dr Ben Coupe graduated with a Bachelor of Chiropractic Science from *Macquarie University* in 2003, and achieved a Master of Chiropractic from *Macquarie University* in 2005. He then gained his certification in *Advanced Biostructural Correction* and became an advanced instructor in 2011. Ben loves seeing a variety of people in his practice, from gym junkies to office workers but especially to people who are looking to get the most out of their body. Nothing excites him more than getting people to realise their bodies own innate potential. He and his wife Dr Samantha Coupe are both ABC chiropractors in Melbourne, Australia