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Improvement in balance, behaviour, respiratory function and Quality of Life in an 11-year-old male with ADHD, Autism Spectrum Disorder and Ehlers-Danlos Syndrome: A case report

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Background: An 11-year old male was presented for care with a complex medical history including ADHD, Autism Spectrum Disorder and Ehlers-Danlos Syndrome. The mother was seeking nervous system care to assist with his quality of life.

Intervention: The patient was placed on a course of care using the Advanced Biostructural Correction Technique, adapted to suit the patient's tolerance, age and Ehlers-Danlos specific hypermobility.

Outcomes: The patient immediately began to show improvements in respiratory function. As the care plan progressed, the patient's mood, behaviour, and engagement with environment improved concomitant with his postural findings and other objective measures.

Conclusion: This case report provides initial indications that Chiropractic care can successfully be deployed to support Ehlers-Danlos patients, and may contribute to optimal management of neurodevelopmental disorders. Further research is required to confirm these effects.

Indexing Terms: Chiropractic; Subluxation; Advanced Biostructural Correction Technique; Quality of Life; ADHD; Autism Spectrum Disorder; Ehlers-Danlos Syndrome.

Introduction

While Chiropractic care across the lifespan remains a priority for Chiropractors and their patients, no single area of Chiropractic has garnered the scrutiny that paediatric care has attracted.

Among the topics that have remained controversial are Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactive Disorder (ADHD). Yet as more evidence emerges linking Chiropractic care to changes in the adult brain, it is becoming more apparent that supporting optimal nervous system function in childhood is likely to be important for neurodevelopment.

While research is yet to demonstrate the degree to which Chiropractic

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care can assist and support optimal neurodevelopment, or the potential for chiropractic to have any impact on the development of ADHD or ASD, what we do have is a growing number of case reports wherein there have been documented changes in the symptoms and severity associated with the disorders.

No causal link has been established, nor do these papers make curative claims. However, it is important to note that this case report evidence is mounting and its power is seen in it being able to provide a direction for future research to elicit mechanisms behind these reported changes.

Previously published ASRF Case Report Project cases have documented the improvement in symptoms in multiple paediatric patients with ADHD while they were under chiropractic care. (1, 2, 3) Two of these cases featured concomitant ASD which appeared to improve in both cases, and the third detailed the improvement in physical resilience that occurred alongside enhanced management of ADHD.

While the definitive aetiology of ADHD is still being unearthed, supported nervous system function and subsequent improvements in perception of the external environment may be involved in the changes in symptomatology.

This case documents the Chiropractic management of a paediatric patient with ASD, ADHD, and difficulties with gross and fine motor skills. It also noted that this patient has Ehlers-Danlos Syndrome, a connective tissue disorder with hypermobility as a symptom. Limited case report data exists in which Ehlers-Danlos Syndrome sufferers are treated by Chiropractors. This is likely to be due to concerns about hypermobility and connective tissue under high-velocity low-amplitude adjustments.

This case illustrates that modified adjusting techniques can be safely executed so that people with Ehlers-Danlos Syndrome can safely engage with Chiropractic care.

Case details

An 11-year-old male student with a relatively sedentary lifestyle presented for Chiropractic care with a complex history of multiple medical diagnoses. He was new to Chiropractic and had received diagnoses of Level 2 Autism Spectrum Disorder, Attention Deficit Hyperactive Disorder, global physical delay across gross and fine motor skills, and an anxiety disorder. At the time of presentation, he also fitted several of the diagnostic criteria for Kyphoscoliotic Ehlers-Danlos Syndrome, and was undergoing testing to confirm this diagnosis.

The patient's Mother described numerous issues and concerns including:

- balance
- coordination
- dropping things
- [poor] posture
- being tired and sleepy all the time.

She reported that he could fall over just standing upright, so poor was his balance. Sitting was very challenging for him, even in a chair. He often would opt to lay on the floor or under chairs. He also had trouble with taking deep breaths.

> The mother noted that she was '*at a point where I thought his quality of life for an 11-year-old was terrible. He had lost interest in a lot of things and he began to realise that he was different to other children, and while his mind was active his body was very different with its ability*'.

The patient also experienced generalised musculoskeletal pain which was rated on a Visual Analogue Scale as between 6-7/10 in intensity.

The patient's mother also reported that he had difficulties with most self-care tasks, like turning taps on and off, opening bottles and lids, and dealing with shoes and shoelaces. He also experienced difficulty with feeding and eating.

Notable physiological observations included slow wound healing and easy bruising, both of which are hallmarks of Ehlers Danlos Syndrome. He had previously had a cut on his knee that created a large scar as the stitches required did not hold.

His mother reported his gestation period was unremarkable, but that he was induced at 40 weeks and 1 day, and that he '*got stuck*' but then was birthed quite quickly. He has 3 siblings, aged 17, 16 and 5, all of whom have been diagnosed on the autism spectrum.

Clinical findings

Upon presentation, the patient was assessed using the Advanced Biostructural Correction (ABC™) Adjusting protocol. Posture was assessed using the Posture Screen software program. Full spine EOS scans were used to further evaluate the patient's posture.

During this assessment, it was noted that there was a reduced range of motion in most planes of the cervical and lumbar spinal regions. Cervical rotation was also painful in both directions. A FABERE test of hip range of motion was 80° on the right but only 60° on the left. Tenderness and restriction of segmental motion was noted at C1, T4 and T10.

His posture was noticeably slumped and had a significant list to the right. EOS full spine x-rays revealed significant posterior weight bearing in the lumbar spine, and a flattening of the upper thoracic and cervical spine, consistent with his postural findings

The patient was then adjusted using the ABC™ protocol. This is a manual, hands-on technique that uses dynamic, full body stretches, known as meningeal releases, followed by manual anterior adjusting from C1 to L5, and instrument or manual adjusting of the lower limbs and pelvis. People undergoing care are also given home advice with regard to correct sitting positions, sleep setups, including mattress and pillow selection, and advice regarding footwear, in his case around the use of orthotics previously prescribed by another practitioner.

In this case, the patient's care plan comprised an initial schedule of two sessions per week for up to twelve weeks, with progress reviews performed every eight visits. Upon completion of this care plan, another twelve weeks was agreed upon, again at a frequency of two sessions per week with progress reviews at twelve and twenty four visits.

The stated aims of care were initially; to stabilise his posture, improve his range of motion, reduce mechanical pain and reduce reliance on external supports such as orthotics. Given the highly sensitive nature of conversations around Autism and neurodiversity, the Chiropractor was careful not to make promises regarding potential improvements in mood and behaviour. However, this was an area of interest for the Chiropractor as the care plan continued.

An additional consideration was the possibility of a looming Ehlers Danlos Syndrome diagnosis. As this is a condition affecting connective tissues and potentially leading to hypermobility and fragile skin, considerations and adaptations were made to ensure the patient could tolerate the adjustment well.

While the patient was assessed for subluxation using the ABC protocol at each visit, changes in spinal alignment were checked using Posture Screen and Microdose EOS scans. For the first care plan, the posture screen rescan occurred at the four week mark, and the Microdose EOS scan occurred at the twelve week mark. On the second care plan, the Posture Screen scan occurred every twelve visits and the Microdose EOS scan at every twenty-four visits.

Outcomes

The patient reported immediate improvement in his breathing from his very first adjustment. His posture showed significant improvement as visualised on Posture Screen through his first and second progress reviews. He had regressed somewhat at his third review, with a return of his forward head posture, but only minor changes in spinal alignment were visible as assessed via EOS.

By this stage, however, he and his parents had noticed significant improvements in his daily functional capacities. He was now able to sit through most of the day at school, being more stable and less prone to falls. He had better energy and a happier, more amiable attitude. This, along with the noticeable changes in his posture lead them to agree to a further twelve weeks of care, continuing with the twice-weekly visit frequency. Posture Screen photos during this time showed further improvement and EOS scans showed significant change in lumbar posterior weight bearing and improved thoracic and cervical spinal curves.

His mother reported that his overall appearance had now changed as he was no longer hunched over and leaning to one side. She reported that his balance was markedly better, and he was able to take deep breaths when breathing in and out. She confirmed that he was never able to do this before. Subjective reports included that he was now more active, and his fall-frequency had decreased.

> Behavioural changes included an openness and desire to try new things. While he still experienced a number of difficulties due to his comorbidities, his mother remarked '*It's like his overall nervous system has improved, and he moves with less caution and appears more stable overall*'.

She further remarked '*When I brought him to a Chiropractor, I didn't have high hopes. I figured anything that could improve his quality of life, which is better than what he has now. I was always so worried about him. The wind could knock him over, and he couldn't stay upright when sitting for longer than about one minute, whereas he can now sit for most of the day with standing breaks before he gets tired. The biggest thing was after the first appointment and adjustment, he sat in the car and looked at me and said "Mum, I can breathe. I can take a full breath and breathe"*.'

It is clear from the concurrent improvements in objective findings, and from the patient and parent self-reports, that this course of Chiropractic care has made the patient's life easier in numerous ways. Mood, engagement with his environment and confidence have all improved. His improved functional capacity has allowed him to be more independent when it comes to the activities of daily life, all of which have made a significant difference in his quality of life.

Discussion

This patient was under the care of multiple practitioners at the time of his presentation, with speech therapy, occupational therapy, physiotherapy, dieticians and a paediatrician all being part of his care team. At the time of his presentation, he was on a waitlist for a neurologist. Given the gamut of treatments he was receiving, it is not possible to know whether his Chiropractic care was solely responsible for the changes observed.

Yet the dramatic change in his posture and breathing so soon after starting care left the mother and Chiropractor with little doubt that Chiropractic care made a significant contribution to his improvement.

This anecdotal evidence should be considered alongside broader Chiropractic research indicating that Chiropractic care supports sensorimotor integration. Given sensory and motor issues feature highly with ASD, (4) and Chiropractic has been shown to support nervous system regulation and appropriate sensorimotor integration, the theoretical scaffolding for Chiropractic care supporting neurodevelopment and regulation in children with neurodevelopmental disorders exists. (5) Of course, larger studies are necessary to test this scaffold before such a case can be argued.

Research has shown that retained primitive reflexes are linked to neurodevelopmental disorders and in a limited number of case reports, they have integrated over a course of chiropractic care. (6, 7) This provides further rationale for paediatric Chiropractic studies into child and infant neurodevelopment, especially given a dramatic rise in diagnoses of ADHD, ASD or dual diagnosis of both conditions.

Conclusion

This case report presents a case for Chiropractic to be considered in the management of complex cases involving children with multiple neurological, developmental and postural disorders such as ASD, ADHD and EDS. The latter takes on specific importance as EDS and paediatric care both require low-force adjusting, which is easily achievable in the Chiropractic context.

At present, Chiropractic as a profession has not staked a large claim on being able to support behavioural, sensorimotor or nervous system regulation in children with multiple neurological disorders. Nor have we examined the role of chiropractic in co-managing complex cases within a multimodal care team. The role of posture in neurodevelopmental disorders such as ADHD and ASD remains wholly uninvestigated, and yet case report data has repeatedly shown paediatric nervous systems calming under care, and thus the conditions becoming more manageable.

As a caring profession, it remains incumbent upon us to investigate the impact of Chiropractic care on neurodevelopment and nervous system regulation in children with and without diagnosed conditions. Only then can we help break down barriers to access when it comes to families engaging with Chiropractic care to support their child's development.

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Dr James Cobb graduated from RMIT University in 1997 with a Bachelor of Applied Science and a Bachelor of Chiropractic Science. He is now in private practice in the Newcastle suburb of Hamilton, NSW.

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