

Improvement in a pediatric patient with Autistic spectrum disorder (ASD) following a trial of chiropractic care: a case report

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ABSTRACT

Objective: To report positive outcomes in a pediatric patient diagnosed with Autistic spectrum disorder (ASD) who was receiving chiropractic care. **Clinical Presentation:** The 7-year-old boy diagnosed with ASD presented for chiropractic care with chronic diarrhea and nocturnal enuresis. **Intervention and Outcomes:** The patient received full spine adjustments utilizing Diversified Technique and Drop Table Technique. After three months of care the patient had resolution of nocturnal enuresis and chronic diarrhea. **Conclusion:** This case study provides supporting evidence that individuals with ASD suffering from nocturnal enuresis and chronic diarrhea may benefit from chiropractic care. More research is warranted in this area.

Introduction

Autistic spectrum disorder (ASD) affects 1 in 100 people in New Zealand.¹ It is a behaviorally defined disorder, characterized by qualitative impairments in social communication, social interaction and social imagination, with a restricted range of interests and often stereotyped repetitive behaviors and mannerisms.² The pathophysiology is unknown and diagnosis is based on clinical observations using criteria established in The Diagnostic and Statistical Manual of Mental Disorders.³ The focus of diagnostic inquiry is on the patient's developmental history, systematically inquiring about their core behaviors and observations in several settings.² Those affected with ASD have problems with sensorimotor integration and motor planning which results in altered motor behavior.⁴ There are no effective pharmacological interventions for this disorder. Prescribed medications address co-morbid symptoms such as attention deficit hyperactivity disorder, obsessive-compulsive disorder and clinical depression.⁵

In a survey of parents with a child diagnosed with ASD, over half reported using at least one complementary and alternative medicine (CAM) therapy for their child. Seventy-five percent of the parents reported that their child benefited from CAM use.⁶ Reasons cited by parents for choosing CAM for their autistic child were related to concerns with the safety and side effects of prescribed medications.⁷ Of the various CAM therapies for children, chiropractic is the most popular and most commonly used CAM approach.⁸ The following case study describes improvements in a child with ASD following a trial of chiropractic care.

Case Report

A 7-year-old male diagnosed at 14-months of age with ASD presented for chiropractic care. History examination revealed the patient had daily chronic diarrhea and nocturnal enuresis. Despite being verbally reluctant and having limited receptive language, the patient maintained good eye contact with a noticeable exotropia of the right eye. He also had various self-stimulatory behaviors such as hand flapping which turned into temper tantrums. At age two he began applied behavioral analysis treatment (ABA) for his toe walking. After three years of this therapy little improvement had occurred. He appeared to be unaware of his environment and the emotions of people around him and did not tolerate other children in his physical space. He also displayed fixative behaviors associated with Obsessive, Compulsive Disorder, watching the same movie multiple times and sleeve chewing. The patient was allergic to pollen, dust mites, horses, cats and dogs. He also suffered from asthma, which was managed by daily medications, namely Ventolin®, Severent® and Becotide®.

The initial chiropractic examination entailed observation, static palpation, motion palpation, postural evaluation, and pelvic deficiency testing. The examination was augmented with the TyTron-C3000 (Titronics, Tiffin, IA) paraspinal digital infrared imaging. TyTron-C3000 thermal imaging revealed significant areas of paraspinal cutaneous heat differential throughout the thoracic and lumbar spinal regions. Neurological examinations of both upper and lower extremities (i.e., dermatomes, myotomes, muscle stretch reflexes) and cranial nerve examination were unremarkable.

At the initial examination the cumulative examination findings indicated vertebral subluxations at the C₁, T₄ and T₇ vertebral levels. A trial of chiropractic care was initiated with the consent of his guardian. The patient received full spine chiropractic care 18 times during a 12-week period using Diversified and Drop Table Techniques consisting of a high velocity, low amplitude thrust. Adjustments addressed vertebral subluxations at the C₁, T₄ and T₇ vertebral levels.

The patient's response to chiropractic care was monitored by his parents, in addition to clinical observations made during his visits to the chiropractor. Within 6 visits, spanning a period of 4 weeks, the patient's right eye exotropia had normalized, his nocturnal enuresis had reduced from 6 nights a week to 2 nights per week and he had consistent and regular bowel movements at 8am every morning. Within 2 months of beginning chiropractic care the patient went to the toilet by himself for the first time, his sleeve chewing and toe walking had also resolved. His parents noted several other positive behaviors including more awareness and reduced incidents of temper tantrums.

Discussion

Based on the active surveillance system Autism and Developmental Disabilities Monitoring Network, the prevalence of ASDs in 2008 was 11.3 per 1000 for children aged 8 years. In comparison to earlier surveillance years, this was an indicated increase of 23% in ASD prevalence between 2006 and 2008 from 9.0 per 1000 in 2006 to 11.3 per 1000 in 2008. There is an estimated increase of 78% when the 2008 data is compared with the data from 2002 from 6.4 per 1000 in 2002 to 11.3 per 1000 in 2008.⁹ In New Zealand where the clinical scenario took place, it is estimated that 1 in 100 people are diagnosed with ASD and with a population of 4 million people; this translates to approximately 40,000 individuals.¹⁰

In terms of its pathophysiology, ASD is multifactorial and involves genetic, environmental and biological factors, reflecting the heterogeneity of the disorder. We caution here that despite the genetic component (i.e., 70-90% concordance for ASD in monozygotic (MZ) twins versus 10 in dizygotic (DZ) twins), environmental factors cannot be dismissed given that the incidence of ASD in identical twins is not 100%.¹¹ Maternal lifestyle and environmental factors such as toxic exposures, teratogens, perinatal insults and prenatal infections such as rubella and cytomegalovirus account for few cases.¹² In addition, ASD is frequent in tuberous sclerosis complex and fragile X syndrome.¹³ Despite the complexity in pathophysiology of the disorder, it is evident that there is a problem with sensorimotor integration and subsequent motor behavior.^{4,14} Research suggests selected aspects of the temporal, parietal, frontal lobes and portions of the amyg-

dala play a part in the pathobiology of autism. The frontal lobe functions in executive brain function involving regulation of working memory, organization, planning, problem solving, environmental monitoring, self-awareness, attention, mental flexibility and abstract reasoning. The orbitofrontal cortex has deep connections with the basal ganglia, which is responsible for behavioral regulation. The medial cortex links to the limbic system, which is responsible for emotional regulation by modulating emotional arousal, mood expression and self-soothing strategies. The concept of developmental disconnects in the aforementioned neural connections fits cohesively with the neurobehavioral features seen among ASD children.¹⁵ Behaviors that are repetitive and obsessive may be due to the individual's inability to modify ones behavior to fit social contexts.

In the case presented, the child suffered from chronic diarrhea and nocturnal enuresis. Parents report significantly more gastrointestinal (GI) problems in children with familial ASD, especially those with full autism, than in their unaffected children. The two most common GI problems in children with ASD are constipation and chronic diarrhea.^{16,18} In children with ASD maladaptive behaviors such as irritability, social withdrawal, stereotypy and hyperactivity correlate with a history of GI symptoms, suggesting these comorbidities require attention.¹⁷

With respect to the child's presenting complaint of NE, one article was found that described the chiropractic care of a 6-year-old boy who presented for chiropractic care with a history of nocturnal enuresis and ASD.¹⁹ The child experienced a traumatic birth and at the time of chiropractic care was following the Defeat Autism Now! (DAN!) protocol. The child received upper cervical chiropractic care over a 15-week period. Overall, there was a reduction in the patient's pattern of atlas subluxation concomitant with resolution of his nocturnal enuresis and significant improvements in both his social interactions and learning difficulties at school. To the best of our knowledge, this is the first reporting in the scientific literature on the chiropractic care of a child with ASD with co-morbid conditions of nocturnal enuresis and chronic diarrhea.

The use of alternative therapies is prevalent in children with developmental disorders. In a survey of parents, Huang and colleagues²⁰ found that 82% of children with ASD used some form of alternative therapy. No pharmacotherapeutic agents are effective for treatment of the core symptoms of autism.²¹ Prescribed medications are provided to ASD children to treat co-morbid symptoms to provide relief of associated symptoms and allow the autistic child to benefit more optimally from educational, vocational and community-based programs. In a survey of Turkish parents of children with ASD on their use of CAM treatments, Senel²²

found that communication, learning, health and behavior were the main four areas rated as “improved” after CAM treatment.

In 2011, Alcantara and colleagues²³ performed a systematic review of the literature on the chiropractic care of children with autism, Asperger’s Syndrome, PDD-NOS, or ASD. The authors discussed the possibility that based on preliminary somatosensory evoked potential studies, chiropractic adjustments may alter sensorimotor integration and filtering. At the heart of the core symptoms of autism (i.e. impaired social interactions, deficits in communication and repetitive or restricted behavioral patterns) is abnormal sensory processing. It is possible that the abnormal sensory processing that occurs in children with ASD may be improved by chiropractic care.²⁴⁻²⁶ If this is the case it may explain a potential link between the chiropractic care that was provided and the improvements observed in this case. There is however a paucity of basic science or clinical evidence to explain or support the link between chiropractic adjustments and the improvements in ASD, nocturnal enuresis or diarrhea that are reported in this case.

As with all case reports the lack of a control group, the potential for spontaneous remission, self-limiting course and natural history of various disorders, subjective validation and expectations for clinical resolution on the part of the patient challenges our ability to make causal inferences with respect to the effectiveness of the care provided. Therefore the reader should consider the generalizability of this and similar reports with caution. Conversely, empirical evidence dominates the chiropractic evidence-based practice. Historically, clinical scenarios such as the one reported here have provided for us with the basis for generalization in clinical practice. In addition to informing higher-level research designs, case reports further provide for clinicians and patients an understanding of their clinical experiences that may lead to an increase in their conviction that chiropractic can “help” a patient. The purpose of case reports is to describe the clinical encounter and challenge notions and unsubstantiated claims about patient care.

Conclusion

We described a child with ASD who experienced improved outcomes in nocturnal enuresis and chronic diarrhea while receiving chiropractic care. We recommend continued research in both the clinical and laboratory setting to fully characterize the effects of the chiropractic adjustment and to enhance our understanding of the potential role for chiropractors in helping patients with ASD, nocturnal enuresis and diarrhea.

Acknowledgement

We express our gratitude to Dr Neil Bossenger (Chiropractor) from Spinewave Wellness Center for his input in the preparation of this manuscript.

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