

# CASE STUDY

## Developmental Delay Syndromes and Chiropractic: A Case Report

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### Abstract

**Objective:** Issues regarding chiropractic treatment for various types of conditions such as developmental delay syndromes, while controversial to some, have some support in the literature. At this time developmental delay syndromes such as ADHD have inconclusive etiologies. While many consider developmental delay disorders solely genetic in origin, others have supported the concept that a subset of patients may have a trauma or other physical related imbalances that could be contributory to the patient's dysfunction..

**Clinical Features:** Presented is a case of fraternal twins where one twin's developmental and emotional growth was notably delayed compared to her other twin. Chiropractic cranial care was rendered, which appeared to assist a positive outcome for the treated child.

**Interventions and Outcomes:** Perhaps a better way of interpreting chiropractic's ability to help patients with learning disabilities, dyslexia, dyspraxia, and ADHD, is viewing a specific subset of patients as having their conditions secondary to trauma. With developmental delay syndromes there are various related possible chiropractic interventions, such as cranial related therapies and upper cervical, cervical and even treatment for pelvic related dysfunction.

**Conclusion:** Since there is some question as to the causation of the various developmental delay syndromes, this ultimately leads to some lack of clarity on treatment options, particularly for children sensitive to medication or who do not choose medication as an option. Patients are seeking alternative care, and particularly care that offers low risk and some benefit should be brought to their attention. While the studies are inconclusive, there is an emerging evidence base that does show chiropractic care can be involved in the treatment and care of patients with developmental delay syndromes. Greater study is needed into understanding which patients might best benefit from chiropractic care, where co-treatment is indicated, and consistent outcome assessment tools to measure changes so mechanisms of care can be evaluated.

**Key Words:** *Chiropractic, ADHD, developmental delay syndromes, sacro occipital technique, applied kinesiology, cranial therapy*

### Introduction

Chiropractic treatment for developmental delay syndromes (DDS), while controversial to some, has growing support in the research literature. Evidence based healthcare is both an

art and a science weighing issues of risk versus benefit with regard to alternative care options for various conditions such as dyspraxia, attention deficit hyperactivity disorder (ADHD),

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learning disabilities, and dyslexia. At this time developmental delay syndromes are thought to have multifactorial etiologies. Contrary to some accepted premises, in one study it was found that dyslexia “and ADHD may be primarily genetically independent<sup>1</sup>.”

Dyspraxia, a subset of DDS is defined as “an impairment or immaturity of the organization of movement. Associated with this there may be problems of language, perception and thought.” A new school of thought in this area is showing that there may be a common factor between these various kinds of DDS. Lesser known than ADHD and dyslexia, dyspraxia affects as many as 5 to 10 percent of children between the ages of 5 and 11, with 2 percent of children being affected severely<sup>2</sup>.

A search of the literature using PubMed found that various types of DDS have interrelationships. For instance, the term “dyspraxia” is related to the term “dyslexia” in 85 papers; and “dyspraxia” is related to the term “learning disabilities” in 99 papers (each search from inception until December 11, 2006). Therefore along with ADHD the condition of dyspraxia has been found to be a frequent comorbidity in children with developmental delay syndromes.<sup>3</sup>

“A prospective epidemiological study of 100 children attending a specialist clinic” noted a “clear pattern of comorbidity” between dyslexia, dyspraxia, learning disabilities, ADHD and other related conditions. It was suggested “the patterns of comorbidity occurred with such frequency that it would suggest that ... the patterns of comorbidity may fit the criteria for a DDS<sup>4</sup>.”

While some studies suggest that dyslexia and ADHD are solely genetic in origin, others have supported the concept that while chiropractors “may not be an expert in all areas of care for the ADHD child, it is important to recognize this interplay of structural, chemical and mental influences, to provide appropriate chiropractic evaluation and care and to consult with an interdisciplinary health care management team, when necessary<sup>5</sup>.”

In situations where an alternative to medication for ADHD is sought, since “many patients (10 to 13% of patients) cannot or prefer not to take medication,” family counseling or chiropractic interventions might offer to this subset of patients a greater ability to cope and function<sup>6</sup>.

These parents and patients are not without just cause to seek alternative care<sup>7</sup> “because both substantial health risks and benefits might be associated with medication treatment for ADHD<sup>8</sup>.” An Australian study [N=24] compared a group of 12 ADHD students receiving medication to a group of 12 ADHD students only receiving chiropractic care, and they “concluded that chiropractic care was 20-40% more effective than medication<sup>9-10</sup>.”

## Case Report

A 2-year-old girl (a fraternal twin) was born by C-section due to her breech presentation. Her twin brother was born

vaginally. Obvious plagiocephaly was present, with the ears and eyes offset one to the other, and an evident head tilt present. The mother reported that previous cranial treatment had helped to level the child’s eyes. A class II, division II occlusion existed where the maxillae were narrowed compared to the mandible below. The child presented for chiropractic care at 28 months of age with frequent rages, furious temper tantrums, and nightmares that caused her to wake up screaming. The child was described as a child that was not able to function in pre-school or at home with the family. She was notably slower than her brother in both intellectual and emotional development.

The initial evaluation of her cranial bones found a left torsion and extension lesion of the sphenobasilar dural tissues<sup>11,12</sup>, with imbalance specifically of her maxillae, occiput, frontal and the left temporal bone. Following treatment the corrections leveled the head, shoulder, and pelvis. Cranial and upper cervical corrections were repeated on 5 subsequent visits, and she was also given a multi-mineral supplement to sooth her nervous system function.

After the 2<sup>nd</sup> visit the child had noticeably improved posture. Proprioceptive testing<sup>13,14</sup> was negative after the 3<sup>rd</sup> visit, and cranial bone respiratory function had significantly improved. After the 5<sup>th</sup> visit, the child was very stable within her family and pre-school environments, and she had stopped walking on her toes as she had prior to beginning chiropractic cranial treatment. The child has been followed up yearly and now is 7 years of age, equal of her twin brother, and performing well in school.

## Discussion

We suggest that a better way of interpreting the ability of chiropractic treatment to help patients with learning disabilities, dyslexia and ADHD, is in viewing a specific subset of patients as having their conditions secondary to trauma that results in sensory-motor disturbances. Recent studies have found that with DDS there are various chiropractic interventions available, such as cranial therapy<sup>15</sup>, upper cervical<sup>16,17</sup>, cervical<sup>18</sup>, and even treatment for pelvic-related dysfunction<sup>19</sup>.

Peitsch has determined that approximately over 50% of newborns from a twin birth will present with deformational plagiocephaly<sup>20</sup>. Children with plagiocephaly have been found to comprise a high-risk group for developmental difficulties presenting as subtle problems of cerebral dysfunction during the school-age years<sup>21</sup>. There is a need for additional research on the long-term developmental problems in infants with deformational plagiocephaly, facial asymmetry, torticollis, and DDS. Plagiocephaly is frequently due to intrauterine lie and depending upon the severity of the cranial tissue distortion, the child’s body has grown around the strain pattern.

Other studies have also found a significant relationship between DDS and traumatic births. Since brain trauma has been found associated with some learning disabilities<sup>22,23</sup>, it is not unexpected that we see studies that show a differentiation of brain wave patterns between children with and without related learning disabilities<sup>24</sup>. This relationship between brain

or head trauma altering brain wave patterns is a common phenomenon<sup>25</sup> and in one study was modified with chiropractic care<sup>26</sup>.

Cranial therapeutic care has been discussed as a treatment for DDS possibly related to birth trauma (plagiocephaly) or head trauma<sup>15,27,28</sup>. These conditions might relate to a non-genetic presentation or that genetics reduces the threshold for its presentation and so other factors might be contributory. Vestibular, ocular, and musculoskeletal problems producing sensory-motor impairments associated with patients with DDS may be affected with chiropractic care<sup>29-31</sup>. So the question of whether this is primarily a genetic disorder should be investigated in patients with DDS and exhibit these comorbidities, particularly when secondary to traumatic birth or childhood injury.

Chiropractic care might be successful because it helps to inhibit the expression of a patient's gene-related DDS by raising the threshold for its presentation. For example, early birth trauma has also been found to be a factor with TMJ dysfunction<sup>32,33</sup>, and interestingly TMJ bruxism has been found related to children with ADHD. One study evaluating chronic bruxism associated with ADHD (likely medication related or at least contributory) found that "subjects affected by ADHD and pharmacologically treated showed higher occurrence of bruxism compared to subjects affected by ADHD not taking medicines and controls<sup>34</sup>." It is possible in patients who have no alternative, other than taking medication for ADHD, that chiropractic treatment for their TMJ related bruxism might assist their quality of life. This relationship between birth or head trauma, TMJ dysfunction and ADHD, could represent a specific subset of patients with non-neuromusculoskeletal complaints who may be responsive to chiropractic care<sup>35</sup>.

## Conclusion

At this time there is no conclusive information on the causation of the various DDS. This ultimately leads to some lack of clarity about treatment options, particularly for children sensitive to medication or who do not choose medication as an option. Patients are actively seeking alternative care, and particularly care that offers low risk and measurable benefits should be brought to their attention. Since for many patients and their families the option of no treatment for DDS is not an "option," we need to explore which patients might best respond to conservative therapies such as chiropractic.

The current evidence supports the premise that some DDS may be secondary to trauma and related to the sensory-motor impairment syndrome known as dyspraxia. While the studies are inconclusive, there is an emerging evidence base that does show chiropractic care may be successfully employed in the treatment of patients with DDS such as dyslexia, dyspraxia, learning disabilities, and ADHD. Studies will be needed for understanding, which patients might benefit most from chiropractic care, where co-treatment is indicated, and in the development of consistent outcome assessment tools to measure changes so that the mechanisms of care can be evaluated. The case report described here cannot conclusively be extrapolated for a large patient segment but offers some

glimpse into what is appearing routinely in some chiropractic clinical practices. Greater research is indicated into the relationship between chiropractic care of DDS in children, particularly secondary to trauma, to determine what subset of these children might be helped with manual therapies.

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