Introduction

Colic & GERD

Colic has been traditionally described as crying, in a healthy infant, more than three hours per day, more than three days a week, for more than three weeks.\(^1\) It is thought to be prevalent in up to 21% of infants.\(^1\) The continuous crying and irritability of the infant has been shown to affect the baby’s development by causing delays neurologically along with negative behavioral problems up to three years of age. Children affected also tend to have more temper tantrums and sleeping difficulties.\(^1\) One study described upper cervical adjustments using knee chest being delivered to 16 infants experiencing...
colic and GERD, of which 100% of cases responded positively to care. The symptoms were completely resolved within 2-8 weeks of treatment. These infants were determined to have subluxations based on thermal asymmetry (using para spinal imaging) and vertebral misalignment (measured through cervical radiographs).

Standard medical practice for GERD is prescription medication. Zantac is the preferred drug of choice, but it is not always successful. Anti reflux procedures can also be used but there is no disease specific quality of life instrument for GERD in children.

Colic is usually managed with the prescription of Dicyclomine. Dicyclomine is commonly given which reduces crying 63% of the time but has side effects of apnea, seizures and coma and Dicyclomine usage is a contraindication if the infant is under 6 months of age. Research in chiropractic has shown that after infants are adjusted, parents report a reduction in the colicky symptoms and less time crying.

**Developmental Delay**

Milestones are used to track a child’s development, for example, the proper age for standing and walking is 9 and 11 months. If a child is having speech and language delays the course of action is to determine if there is a primary cause of unknown etiology or a secondary effect. These delays can stem from conditions like autism, hearing impairment, general developmental difficulties, behavioral or emotional difficulties, or neurological impairments. Speech therapy has been proven to be beneficial for these children.

In the past decade there has been a 5-20% increase in the number of children who experience developmental delay syndrome (DDS). Research has found that poor muscle tone is related to postural disorders, sensory motor, coordination disorders, and kinesthesia in children with DDS. Since 1990 the number of prescriptions for Methylphenidate (Ritalin) has increased by 700%. This may be why people have started seeking alternative medical care including chiropractic, dietary modification, and the use of vitamins, minerals, and other dietary supplements.

The children who are treated pharmacologically suffer from subtle or not so subtle cognitive impairments that persist into adulthood and this can affect employment status, educational achievements, health care consumption, and criminality. Fortunately, there is some evidence that multimodal chiropractic methods have been efficient in helping children by reducing symptoms in DDS as well as non-musculoskeletal conditions.

**Case Report**

**History**

A 15-month-old female patient presented to the chiropractic clinic after her mother noticed developmental delays in the child. These developmental delays included not standing, walking or talking for her age level. She was fully vaccinated. She had not been speaking more than 2 syllables, which was congruent with an 8-month developmental pattern. She was crawling which was congruent with a 9-month-old developmental pattern. Overall, she had a 6-month developmental delay. If she had met the proper milestones, she would have been walking unassisted by 12 months and speaking at least 2-3 word phrases.

Previous chiropractic care had been sought for complaints of GERD and colic in the child from birth to 5 months of age. At that time, it was determined that she had abnormal response to testing of cranial nerve 8. Other abnormalities included absent biceps reflex bilaterally and abnormal Cross Extensor, Landau, Rooting, Placing and Sucking. Toggle sustained contact technique was utilized to address misalignment of C1. A listing of anterior, superior, lateral, ASL, was determined for the left side of C1, via leg length analysis. After three visits, the symptoms related to colic and GERD had resolved. Afterwards, the patient was inconsistent with care and then presented to the office at 15 months showing signs of developmental delay.

**Examination**

Upon physical examination, she had a left head tilt, left high shoulder, left cervical and thoracic paraspinal hypertonicity. Also revealed was a left hip restriction, left prominent occiput, right high occiput, right short leg ¼ inches, and left hyper mobile TMJ. Her reflexes were normal, however she had abnormal oculomotor signs. This included abnormal left eye tracking and pupillary response.

Vertebral subluxations were identified at C1 and sacrum. C1 had misaligned anterior, superior, and lateral on the left, listing of ASL, via a supine leg check according to Toggle protocol. Her left leg was short by ¼ inches and when left C1 was pressure tested, her legs balanced.

Subluxation at sacrum was determined by observing the gluteal folds in the prone position. Pressure was applied to both gluteals from lateral to medial, the fold deviated to the right. This was indicative of an anterior, inferior (AI) sacrum on the right.

**Intervention**

She was seen once a week for a total of 19 visits. C1 was adjusted using a Toggle Headpiece with a light thrust and a drop. The right sacrum was adjusted using Logan sustained contact.

Logan procedure is based on the concept that the sacrum is out of alignment, which causes stress and instability. The doctor stands on the opposite side of the AI sacrum and finds the sacrotuberous ligament. This can be done by locating the coccyx and locating the ischial tuberosity and then locating the midpoint between the two segments.

The doctor uses the 5th digit of the inferior hand to make contact along an anterior to posterior, inferior to superior, and medial to lateral line of correction. The palm of the inferior hand is facing up. The superior hand contacts the spinouses to the cervical region, three fingers at a time.
Developmental Delay

As this is performed, the line of drive for the 5th digit changes and emphasizes more on the inferior to superior vector. When the superior hand reaches the occiput the procedure is complete. As the thumb reaches between the mastoid and occiput on the same side, the doctor will hold until they feel synchronous pulsing. After each adjustment, her legs balanced in supine position and the gluteal fold was centered.

Outcomes

By the third visit, she started walking with assistance, but no improvements were noted in speech. By the 4th visit, she was walking on her toes with assistance. Cranial work was performed and exercises on a stability ball were integrated into her care. The exercises were performed by supported sitting and supported standing on top of a ball in order to strengthen the core. The cranial work focused on opening the sutures by applying pressure to the sagittal, coronal, and lambdoid sutures. Cranial work such as this is performed to help restore circulation and drainage to somatosensory areas of the cortex especially through the sagittal sinus.7

By the 6th visit, she was walking by holding on to the table and had also added more words to her vocabulary. By the 9th visit, she had taken 6 steps by herself and added three more words to her vocabulary.

By the 18th visit, she was standing by herself and had added 3-4 more words to her vocabulary including some she spoke in Greek. A reassessment was done on the 19th visit, at which time she was 19 months old. She was walking at a 12-month level. Her speech was at the proper developmental milestone. All postural distortions were resolved except for hypertonicity of the left thoracic region and a high occiput on the right.

Discussion

Characteristics of delayed speech and motor skills in walking have many times been associated with other etiologies such as general developmental difficulties and autism, behavioral or emotional difficulties, or neurological impairments.5 Autism spectrum disorder (ASD) is a developmental disorder with no known etiology and is usually noticed around 18 months when the behavior and actions of the child are not progressing along for the appropriate age. Also noted in this category are impairments in social interactions, communication, motor coordination, and problems with executive function.

One theory suggests exposure to mercury, which is an ingredient in many vaccines as the cause. Another theory suggests it is a breakdown in communication between the brain regions.8 Those who receive treatment interventions earlier seem to improve more than children starting at an older age 9 with health and lifestyle improvements early in life having an impact on health and quality of life in later years.

Muscloskeletal problems in children are associated with both physical and psychological issues which can impact the individual’s health throughout life.10 In a study done at the Angelo – European College of Chiropractic (AECC) on 781 pediatric patients younger than 3 years of age, 85% of the patients’ parents reported an improvement and there were no serious complications resulting from chiropractic treatments.11

In 2007, The National Center for Health Statistics found that manipulation by chiropractors or osteopathic physicians is the most sought after care for children as complementary and alternative (CAM) therapy amongst US children under the age of 18.12

Cuthbert and Barras reported on 157 children with Developmental Delay Syndrome. Applied Kinesiology (AK) technique was used to assess structures producing the muscular dysfunction.9 Manipulative therapy was then used to improve the motor response and post treatment showed improvements in muscular strength, coordination, flexibility, and timing with improvements in gross and fine motor function. The children showed 6-33% improvements in 20 psychometric tests.6

A study performed by Psycho-Educational and Guidance Services stated chiropractic treatment was effective in reducing symptoms common in a wide range of learning and behavioral dysfunctions. Chiropractic was 20-40% more effective than medications.13

Elster described the work of BJ Palmer in her case report on a patient with Multiple Sclerosis. Palmer, a pioneer in chiropractic, stated that through upper cervical care improvements could be seen in spasticity, muscle cramping, muscle contracture, joint stiffness, fatigue, joint coordination, trouble walking and muscle weakness.14

Based on the literature it seems that chiropractic adjustments can be beneficial in helping children with DDS. The patient in this case saw immediate improvements after being adjusted. Chiropractic care is based on the analysis and correction/reduction of vertebral subluxations. There are several models to describe the vertebral subluxation including the vertebral subluxation complex (VSC) which includes but is not limited to myological, kinesiological, neurological, components.

Another model - The Proprioceptive Insult Hypothesis states vertebral misalignment produces overstimulation of proprioceptive nerve endings in and around the area. It is hypothesized to cause impaired spinal function at that level and increase muscle tone.15

The Dysafferentation Model states similarly that the spine is loaded with nerve endings, mechanoreceptors and nociceptors, which are monitored by the central nervous system. Proper input into the brain has a direct effect on output and can result in these types of neurological and functional delays.16

Conclusion

The case of a 15 month old female with developmental delays and a past history of colic and GERD was presented. Significant improvements were noted following the introduction of chiropractic care utilizing Toggle Infant Headpiece, Logan sustained contact technique, cranial release, and prescribed stability ball exercises. This study
adds to the evidence regarding chiropractic care and DDS. More research needs to be done in the area of developmental delays and the benefits of chiropractic care for the pediatric population.

References