CASE STUDY

Improvement in Autism in a Child Coupled with Reduction in Vertebral Subluxations: A Case Study & Selective Review of the Literature

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Abstract

Objective: To describe and discuss the objective and subjective changes in a 6 year old male child following chiropractic care over a period of 16 weeks who was originally diagnosed with Autism.

Clinical Features: A 6 year old boy presents with reduced social interaction, altered behavioral patterns, language deficits, and learning difficulties. The child was previously diagnosed with Autism by a neurologist after brain pathology was ruled out. The child was up to date with all vaccinations per the recommended medical schedule.

Interventions and Outcomes: Objective data, such as static palpation, motion palpation, and leg checks were used to determine the presence of vertebral subluxations in the child. The Autism Treatment Evaluation Checklist (ATEC) was also used. A chiropractic adjustment schedule along with dietary and supplementation recommendations were advised at the initial visit. Diversified, Thompson Drop Assisted techniques, and trigger point therapies were used to reduce the subluxations that were found. Over the 16 week period, where adjustments were given regularly, a reduction in vertebral subluxation patterns and an improved ATEC score were noted. Improvements in learning abilities, social interactions, language skills, and behavioral patterns were also noted.

Conclusion: In this case, a possible link between chiropractic care and the reduction of autistic signs and symptomatology is indicated due to the improvements in subjective and objective findings. Studies of a similar nature have been conducted previously with similar outcomes. However, more research needs to be conducted in order to evaluate the precise connection between vertebral subluxation, chiropractic care, Autism, and other Autistic-like Disorders.

Kev Words: *Autism, Chiropractic, Subluxation, Pediatric, ATEC, Diversified technique, Thompson technique*

Introduction

Autism is defined as a brain development disorder that causes impaired social interaction, decreased communication ability, restrictive repetitive or stereotypical behaviors, and decreased cognitive and learning abilities. [1, 2] The prevalence of autism in the United Kingdom has been reported by Chakrabarti et al to be 16.8 per 10,000 in 2001 [3] and 22.0 per 10,000 in 2005.[4] In the United States the number of people with autism ages 6-21 has risen from 5,145 in 1991-1992 to 118,602 in 2001-2002. The increase in students in the United States with autism has risen 1700% in that same time period.[5] This has profound implications not only on the population but also on the economy for it is estimated that as of 2000, $18,581,511,000 is spent annually in the United States for children with autism and autistic like disorders in their education.[5]

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The exact cause of autism is still unknown. Multiple theories have been proposed to explain the possible causes. A study conducted by Gregg et al showed similar genetic sequences and expressions in immune natural killer cells in children with autism as compared to controls.[6] A review of neuropathophysiological literature conducted by Palmen et al demonstrates the various studies done to show the changes in cellular morphology and density in the limbic systems, cerebral cortexes, and cerebellums of children with autism compared to control subjects.[7] Ashwood et al suggests that immune system abnormalities, such as skewed T helper cell type cytokine profiles (Th1/Th2), decreased lymphocyte numbers, decreased T cell mitogen responses, and serum immunoglobulin level imbalances, all have the ability to disrupt early neuroimmune interactions, which can retard early neurological development seen in autism.[8]

Elder cites a possible nutritional cause, where gluten and casein may cause increased intestinal permeability to opiod proteins, which, when metabolized by the brain, may effect the endogenous opiate system and neurotransmission of the brain.[9] It has also been suggested that the rise in autism is somehow linked to vaccinations containing Thimerosal,[5, 10] which is an organic compound used as a preservative that contains mercury.[11] According to the FDA, as of 2005, multiple vaccines, including those generally given to children 6 years of age and younger, contain traces of Thimerosal.[11]

Mercury has been shown to have a neurotoxic effect in humans, especially in its ability to alter the transport of glutamate in astrocytes.[12] Also, mercury has been found to cause a T helper cell subtype 2 dominance over T helper cell subtype 1 in mice, which showed increased tendencies towards immunostimulation, autoantibody formation, and autoimmune problems.[13,14] This suggests a possible link between mercury-containing Thimerosal and the various immunological and neurological causes of autism. However, it is possible that the exact cause of autism is a combination of multiple factors.

Case Report

Patient History

A 6 year old male enters into a private practice for chiropractic care with a diagnosis of autism. This diagnosis was made one year prior by a neurologist. Prior to entry into chiropractic care, the patient had received EEG, MRI and a neurological consult to rule out brain pathology to account for loss of social skills, inability to make eye contact, constant head rocking, and a jabbering type of speech pattern with minimal vocalizations. All tests were negative for brain pathology and an autism diagnosis was made.

The patient's previous history includes a vaginal birth assisted by epidural medication; not being breast fed as an infant; and receiving all typical vaccinations. The child was up to date with all vaccinations upon entry into chiropractic care, received daily doses of Ritalin, and received speech therapy in school twice weekly. This was done by the school psychologist, who confirmed the diagnosis of autism.

The mother brought the child in for chiropractic care because the literature she had found informed her that chiropractic care can assist children with autism. She also had a desire to wean the child off Ritalin. She states that she was not sure if the patient had regressed after successive vaccinations. Upon further questioning, the mother reported that the patient's diet excluded sugar as much as possible. However, the mother admitted that the patient preferred chicken fingers and french fries over all other foods. The only exercise the child received consisted of bouncing on a trampoline while at their weekend campsite.

Autism Treatment Evaluation Checklist

Prior to the initial examination, the mother was asked to fill out an Autism Treatment Evaluation Checklist (ATEC) in order to have a baseline for the monitoring of future clinical changes of the patient. The ATEC, created by the Autism Research Institute, was "designed to assist parents, physicians and researchers to evaluate virtually any treatment for Autism."[15]

It consists of 4 sections, which cover the patient's communication/speech abilities, sociability, sensory/cognitive awareness, and health/physical behavior (See Figure 1). Each section is scored independently in order to show the patients status in each area. Then, the four scores are added together to give a total score in order to assess total impairment. The higher the score a patient has, the higher the patient's level of impairment; the maximum score a patient can receive is 180.[15] The reliability and validity of the ATEC survey will be discussed later. Based on the scoring method, which is provided free of charge on the Autism Research Institutes website, the patient's initial scores were 16/28 in communication impairment, 16/40 in sociability impairment, 15/36 in sensory/cognitive awareness, and 23/75 in health/physical behavior, for a total score of 70/180. A score of 70 indicates that the patient is in the 50-59th percentile of severity, indicating a moderate severity.[15]

Examination

The initial chiropractic examination revealed that the child appeared well nourished and presented with a right head tilt, right elevated shoulder tilt, and walked with his right foot internally rotated. The child would not make eye contact when addressed and would whine when palpated. Cervical range of motion, measured by the use of a goniometer, revealed that rotation was limited by 50% (40/80 degrees) in left rotation as well as left lateral flexion (20/40). Upon lying prone on the examination table, it was noted that the patient had a functional right short leg by one inch when compared to the left. Through the use of Derefield leg checks, static bony palpation, static muscle palpation, motion palpation, and postural analysis, a vertebral subluxation pattern was determined.

The Derefield leg check, also known as the Derefield-Thompson leg check, was developed to allow clinicians to quickly determine a leg length inequality.[16] This is accomplished by having the patient lie prone, and quickly observing which leg is shorter than the other. After a "short leg" is identified, the clinician would then proceed to flex the patient's knees to 90° in order to observe any changes in leg

length. This is done to identify pelvic/sacral subluxations. If a short leg becomes observably lengthened in the flexed position, it is termed a "positive Derefield," indicating a posterior-inferior ilium. Conversely, if the short leg stays short or balances in the flexed position, it is termed a "negative Derefield," indicating either an anterior-inferior sacrum, posteriorly rocked ischium, or lumbar subluxation.[16, 17] It has also been found that the reliability between examiners in determining the presence of subluxation through Derefield leg checks is high.[16, 18]

Static palpation is used by many clinicians in order to determine the location or position of bony structures, sites of pain or tenderness, and the presence of edema.[19] It is essential in knowing the actual position of vertebral segments, for it helps to determine the exact area of the body that requires attention and the area of the spine that is subluxated. Research has shown there is high inter/intraexaminer reliability with static palpation when used to elicit pain. However, it was also found that no palpatory technique is superior to another.[19]

Motion palpation is often used by clinicians in order to identify if specific segments are moving freely and are not restricted in any of their normal ranges of motion. This is useful in identifying segments in the spine that are subluxated.[20] It has been determined that motion palpation is useful as an assessment tool for the location and removal of perceived motion restrictions.[20]

Clinicians often use postural analysis in order to link the structure and function of the neuromusculoskeletal system.[21] It looks to find symmetric relationships between vertebral segments. Posture can be analyzed in a static or dynamic position.[21] Furthermore, if postural abnormalities are found, analysis must be used to determine if the abnormalities are functional, due to soft tissue abnormalities, or structural, due to congenital anomalies.

The subluxation pattern included a fixated right ilium, posterior and inferior with external rotation, which was confirmed with palpation and right short leg that crossed over, indicating positive Derefield. Also, the second thoracic vertebra was listed as posterior-left and second cervical spinous process was left of midline. Tender trapezius trigger points and spasms were noted on the right.

Intervention

After the examination was completed, the patient received his first adjustment session. The sacro-iliac adjustment was done prone using a drop piece, in accordance with Thompson Drop Assisted Technique, incorporating a lateral to medial, inferior to superior line of drive. The Thompson Drop Assisted Technique utilizes the aforementioned Derefield leg checks to determine the presence of subluxation, either in the cervical region or pelvic region. If a subluxation is deemed present, the clinician will adjust the patient on a table that has a drop assisted mechanism in order to help facilitate the delivery of the adjustment.[17]

A drop mechanism consists of segmental portions of an examination table that is able to lift slightly, either mechanically with a lever or through air pressure. The mechanism will then drop a distance up to an inch when enough force is applied to the section of the table that is cocked. The amount of force needed may be altered by using spring tension or air pressure. It is designed to lighten the adjustive force given by the clinician while still delivering the proper force required to adjust the specific segment.[17] After the adjustment is delivered, the legs are checked again for any length discrepancy. If no discrepancy is found, the patient is considered to be "balanced," and the clinician is free to move on to any other adjustments or analysis he/she sees fit.[17]

The thoracic adjustment was made with a prone spinous contact and posterior-anterior, lateral-medial, inferior-superior line of drive utilizing Diversified technique. The subluxation found at C2 was corrected using a Diversified supine maneuver with a lamina contact and posterior-anterior, lateral-medial, inferior-superior line of drive. The Diversified technique is described as a segmental model, where each vertebral segment is assessed for alterations in proper intervertebral motion and position. If alterations are found, the segment is defined as subluxated.[22]

After the adjustments were rendered, recommendations for the usage of probiotics and antioxidants were given. However, the mother admitted to having already placed the child on a regimen of Vitamin C. At that time, a plan of two visits per week for eight weeks was given and a reassessment of the patient would be conducted.

Outcome

Improvement was noted after the 4th adjustment. The mother mentioned that the child no longer rocked his head and jabbered less. Also, after the 4th adjustment, the right SI was adjusted in a side posture Diversified position with the same line of drive as the previous sacro-iliac adjustment. After his 6th adjustment, the child began spelling out the words on video cassette covers, which is something he had never done before. The spelling of words in lieu of vocalizing the words continued for 6 weeks. He would either jabber or spell, but he would not vocalize words. The mother reported that after 7 weeks, the child began to vocalize his name, as well as the words that he had been spelling.

After 8 weeks, a reassessment was conducted, which showed marked improvement (See Table 1). It showed that cervical ROM had returned to within normal limits, and the leg length discrepancy had reduced from 1 inch to ½ inch. Postural analysis showed the removal of the previous right foot internal rotation, right head tilt, and right shoulder tilt. Trigger points in the trapezius reduced from full spasm to a small degree of hypertonicity. Changes in vertebral subluxations were also noted. Upper cervical subluxations had been eliminated, confirmed by ROM and palpation. Subluxation patterns after 8 weeks had changed to a posterior-inferior right ilium with no external rotation, an anterior T4-5, and a posterior-right C6. This was determined utilizing the same methods of objective analysis used in the initial examination.

The adjustments during the 8th week, utilizing Diversified Technique, included side posture for the sacroiliac joint with line of drive previously mentioned, anterior to posterior line of drive for the thoracic adjustment, and a lamina supine contact

for C6 with posterior-anterior, lateral-medial, inferior-superior line of drive.

By the 12th week of care, the child was performing well in school. It was reported that the patient did exceptionally well in math and was reading in class. The mother was able to change the child's diet to a more healthy option. At that time, the mother withdrew Ritalin. It was also noted by the mother that there were improvements in his communication skills, sociability, awareness, and behavior. The child was able to use sentences that contained four or more words; he would make eye contact and show less disagreeability; he began to understand his own name more often and would understand explanations more frequently; and there were no incidences of rocking, less incidences of crying, obsessive speech, and hyperactivity.

Thus, a second ATEC was given to the mother in order to measure the progress of the patient. There were improvements in all four sections (See Figure 2). Speech/communication impairment improved from 16/28 to 9/28, sociability impairment reduced from 16/40 to 7/40, sensory/cognitive awareness improved from 15/36 to 6/36, and the health/physical behavior score reduced from 23/75 to 10/75. When all four scores are totaled, a reduction from 70/180 to 32/180 is seen, which is a 54.3% overall improvement, indicating mild severity.[15]

During further chiropractic visits, it was noted that the child had begun to complain of a sore throat. This was diagnosed by the pediatrician as gastric reflux, and the mother refused medication for the child's reflux. The mother was informed by the chiropractor that the increased reflux was possibly due to a parasympathetic rebound from months of sympathetic stress from subluxation and medication.

Since alterations in the parasympathetic nervous system have been shown to cause symptoms of gastric reflux,[23] it is possible that a parasympathetic rebound phenomenon, where a surge of parasympathetic activity is noted after sudden intense or prolonged periods of stress, is the cause of the patient's gastric reflux. At that time, recommendations for the introduction of probiotics were made again, and the previously mentioned cervical and pelvic listings were adjusted for 4 weeks before throat symptoms and subluxation patterns abated.

Discussion

Proposed Mechanisms

The improvements in objective and subjective criteria are clearly stated, and show a possible link between the reduction of vertebral subluxations and the signs and symptomatology of autism. A vertebral subluxation is defined as a mechanical problem of the spinal column that causes nervous interference. A mechanical problem can consist of a bony misalignment which can cause stretching or loosening of surrounding soft tissues.

For example, surrounding musculature can be pulled taut or relaxed depending on position of the vertebral segment and location of the muscles attached. These muscles contain muscle spindles, which are defined as sensory receptors that measure muscle length and/or change in muscle length.[24] This information is sent to the CNS in order for it to modify or control the activity of the receptors. Motion of muscles will cause either the increase or decrease of impulses from the spindles to the CNS. Current physiological science shows that sustained lengthening or shortening will cause the CNS to "reset" the length to tension ratio of the spindle, essentially allowing the current length of the muscle to be maintained as normal. Thus, the sensory information from the receptors is altered in favor of the new altered output. This is called "dysafferentiation."[22, 25]

Sensory dysafferentiation from mechanoreceptors and nociceptors can lead to altered output to the cerebellum and cerebrum. This has the potential to mimic lesions of the vestibular nuclei, cerebellum, cerebral cortex, and basal ganglia. In the case of autism and other autism spectrum disorders, these lesions could be the cause behind the multitude of signs and symptoms exhibited, such as hyper/hypoactivity and sensory dysfunction.[25, 26]

A proposed mechanism for the improvement of children with autism is the adjustment of vertebral segments that are determined to be subluxated. Since it has been determined that muscles that are used for fine motor control and posture contain the highest amount of sensory receptors,[24] adjustments to the spine could have the highest impact on afferent sensory information. By restoring proper position and motion to these segments, afferent sensory information is returned to normal, effectively resolving the neurological dysafferentiation.

The complete reduction of subluxation is a clear indication of improvement. However, it may be perceived that the continued presence of vertebral subluxations, although in different areas or listings, indicates a lack of progress. This may not be the case.

According to the theory of pattern analysis[27] utilizing a dynamic nervous system model, a patient that has a healthy nervous system is able to adapt to his/her environment. If a patient is subluxated, a patient is unable to optimally adapt to changing stimuli. This can be seen in recurring vertebral subluxations and similar thermal patterns obtained from thermography.[27]

Another possible mechanism connecting subluxation to autism and other autism spectrum disorders is called "functional disconnection."[28] It is proposed that a functional disconnection between the right and left hemispheres of the brain coupled with reduced activity and coherence in the right hemisphere can help to explain the signs and symptoms of autism as well as the observed increase in sympathetic activation. Specifically:

"…lack of synchronization or a temporal coherence between two hemispheres and/or various large areas of the central nervous system leads to a lack of optimized communication between these areas. This lack of optimized activity leads to an under connectivity between brain regions and these two factors result in a functional disconnection syndrome. This disconnection is due to one hemisphere being more active and functioning at a higher oscillation rate. This prevents the

ability of the two hemispheres to synchronize, bind and share information thereby theoretically impeding temporal binding of distant neurons. This forces the individual to choose between different virtual sensory images of the world and due to cortical-cortical inhibition the underactive areas are suppressed or impaired, leading to reliance of information primarily from one hemisphere."[28]

By increasing input into the right hemisphere of the cortex, the imbalance may be corrected and proper connection may be created. As mentioned previously, sensory information is carried from the spine to the cerebellum and to the cerebral cortex. It is understood that mechanoreceptor information from the body travels afferently to the ipsilateral cerebellum, which is carried to the contralateral cerebral cortex. It has also been documented that lesions in cerebellar nuclei can result in deficits and problems within the cerebrum.[29] By increasing mechanoreceptor sensory information to the left side of the body, information will travel to the left and from the left cerebellum to the right cerebral cortex. Therefore, chiropractic adjustments to the left side of the body may achieve the desired stimulation of the right cortex.

In addition to the chiropractic care received, alterations to nutrition and supplementation may have aided in the improvement of the objective and subjective findings. One possibility includes the introduction of probiotics into the diet.

It is well documented that the normal gut flora of the intestinal tract aids in the digestion of nutrients, yields important effects on the intestinal epithelium, assists in the formation and maintenance of normal cell-mediated and humoral immunity, and protects against invasion of possible harmful and opportunistic bacteria.[30] Evidence also shows that children with autism or other autism spectrum disorders tend to suffer from a lack of normal, healthy gut flora in favor of high amounts of the bacteria type *Clostridium.* [31]

By introducing probiotics into the diet, the removal of possibly pathogenic bacteria and resumption of normal physiology is possible. The removal of the fried, fatty foods may have also contributed to the improvement of the patient. Sugars, trans-fatty acids, and foods that are overly-refined and processed have been shown to cause the body to enter into an inflammatory state,[32, 33] which then alter immune patterns.

Food allergies also have the ability to alter immune function of children. The previously mentioned study by Elder mentions the presence of gluten and casein could impact the normal gut physiology of autistic patients.[9] Also, Cade et al showed that autistic patients tend to have high titers of IgG antibodies to gluten and casein, and that a diet that reduces gluten and casein can result in a reduction of symptomatology.[34]

Food allergies, improper gut flora, and improper diet all have the capability of altering T helper cell type cytokine profiles and serum immunoglobulin levels, which, as previously mentioned, can disrupt neuroimmune interactions and neurological development.[8]

Chiropractic Literature

Current literature within chiropractic has yet to determine the efficacy of chiropractic care in the treatment of autism. However, many studies have shown improvement in children with autism similar to this case. A study conducted by Hoffman et al showed that through the elimination of vertebral subluxation, a 3 ½ year old autistic girl saw improvement in subjective and objective findings.[26] Over 10 weeks of care, the child received Full Spine adjustments where indicated utilizing the Torque Release Technique protocol and the Integrator instrument. The clinicians utilized palpation, range of motion, spinal thermal graphing, and spinal electromyography (EMG) to determine the presence, location, and reduction in vertebral subluxations. Improvements were first seen after the 2nd week and 5th visit. After one month of care, the patient was reported to have increased spontaneity, increased expressions of joy, better posture, fewer occurrences of nightmares, less hyperactivity, and fewer expressions of discomfort and sadness. The patients thermal and EMG scans showed increased symmetry as well.

A study by Khorshid et al focused on improvements in 14 autistic children utilizing Full Spine technique and upper cervical care.[35] Specifically, Atlas Orthogonal technique was used for the upper cervical care. The aim of the study was to determine the clinical outcome differences of autistic children under Full Spine care versus Atlas Orthogonal care. The study utilized leg checks, x-ray analysis, and ATEC surveys to monitor the progress of the patients. ATEC scoring indicated that 6 of the 7 children under Atlas Orthogonal showed improvement, and that 6 of the 7 children under Full Spine care also showed improvement. Furthermore, it was shown that children under Atlas Orthogonal treatment showed 32% improvement in ATEC scoring while children under Full Spine care showed 19% improvement.

Another study conducted by Aguilar et al observed the effect of chiropractic adjustments on 26 autistic children over a 9 month period utilizing the "Orthospinology specific" upper cervical technique.[36] The criteria for adjusting were supine leg checks, Brain Stem Evoked Potentials (BSEP), x-ray analysis, and thermography. After the 9 month period of time, the objective findings were as follows: all of the children no longer had a leg length discrepancy, thermal graphing was more symmetrical in the majority of the children, and there was decreased latency in the BSEP waves in most of the children. Subjective observations were either made by the parents or teachers of the children. During the course of treatment, Ritalin was no longer given and improvements in bowel and bladder were noted. There were also observable behavioral changes. Some of the children started to speak, and in others, hyperactivity and aggressiveness decreased. Some children began to make eye contact and had improved attention spans. Furthermore, five of the children were able to attend mainstream classes at school for the first time.

ATEC Reliability and Validity

The reliability and validity of the ATEC survey has been tested and confirmed by the Autism Research Institute and independent studies. According to the ARI, the reliability of the ATEC was examined by "conducting a split-half reliability

test on over 1,300 completed ATECs." Using the Pearson split-half (internal consistency) coefficient for uncorrected r, where N = 1358, speech was 0.920, sociability was 0.836, sensory/cognitive awareness was 0.875, and health/physical behavior was 0.942.[15] The previously mentioned study conducted by Khorshid et al utilized 14 patients under chiropractic care. Improvements in ATEC scores were matched by improvements in leg length analysis and x-ray analysis.[35]

Another study by Lonsdale et al utilized the ATEC to monitor improvement of 10 autistic children who were being treated with thiamine tetrahydrofurfuryl disulfide (TTFD).[37] Eight of the ten children showed improvement in their ATEC scores, which was confirmed with urinary and hair analysis and erythrocyte transketolase levels.

Traditional and Alternative Treatments

Aside from chiropractic, treatments for autism and other Autistic Spectrum disorders are wide-ranging. The "best practices" for treatment of autism consists of two therapies.[38] The first is called Applied Behavioral Analysis (ABA). It focuses on the breaking down of life skills, play skills, and academic tasks into less complex sub tasks. Once each subtask is mastered, the patient moves on to the next with the goal of combining all of the tasks together in order to perform the complex task itself.

The second therapy is social-pragmatic therapy. It builds upon the patient's current social and communication abilities and behaviors by focusing on the patient's motivation and concentration.[2, 38] Other therapeutic approaches that are used include communication-focused interventions, contemporary ABA, developmental approaches, environmental modification programs, integrative programs, sensory motor interventions, and social skills development interventions.[39]

Many pharmacological therapies that have been shown to treat autism and other autistic like disorders focus on serotonin and dopamine uptake in the brain.[40] Studies that have utilized drugs such as "Olazapine" and "Risperidone," by focusing on this mechanism, have seen improvement in autistic patients.[41, 42] Another pharmacological therapy was previously mentioned in a study conducted by Lonsdale et al,[37] which utilized TTFD in order to address an observed deficiency of sulfur and thiamine in autistic patients.

Nutritional therapies have also been shown to cause improvement in patients with autism. The previously mentioned review conducted by Elder suggested a diet free of gluten and casein would prevent the possible metabolic and gastrointestinal causes of Autism and other Autism Spectrum Disorders.[9] Furthermore, the study by Cade et al showed improvement in the symptoms of Autism within 3 months when removing gluten and casein from the diet.[34]

Also, a study conducted by Amminger et al demonstrated that supplementation of Omega-3 fatty acids when compared to placebo showed improvements in the signs and symptomatology of Autism.[43] Another study suggests that supplementation of vitamins A and D into the diets of autistic patients may improve symptoms.[44]

Conclusion

This case demonstrates that there is a possible link between chiropractic care and the reduction of autistic signs and symptomatology, as seen by the improvements in subjective and objective findings. However, more research needs to be conducted in order to evaluate the precise connection between vertebral subluxation, chiropractic care, autism, and other autistic-like Disorders.

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Figure 1 – The Autism Treatment Evaluation Checklist created by the Autism Research Institute in order to assist parents, physicians and researchers to evaluate Autism treatments

ARI/Form
ATEC-1/11-99

Autism Treatment Evaluation Checklist (ATEC)

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Project/Purpose:				
Scores: I	II	III	IV	Total

This form is intended to measure the effects of treatment. Free scoring of this form is available on the Internet at: www.autism.com/atec

Name of Child _____ _____ ☐ Male Age _____
Last First ☐ Female Date of Birth _____
Form completed by: _____ Relationship: _____ Today's Date _____

Please circle the letters to indicate how true each phrase is:

I. Speech/Language/Communication:
[N] Not true [S] Somewhat true [V] Very true

N S V 1. Knows own name
N S V 2. Responds to 'No' or 'Stop'
N S V 3. Can follow some commands
N S V 4. Can use one word at a time (No!, Eat, Water, etc.)
N S V 5. Can use 2 words at a time (Don't want, Go home)
N S V 6. Can use 3 words at a time (Want more milk)
N S V 7. Knows 10 or more words
N S V 8. Can use sentences with 4 or more words
N S V 9. Explains what he/she wants
N S V 10. Asks meaningful questions
N S V 11. Speech tends to be meaningful/ relevant
N S V 12. Often uses several successive sentences
N S V 13. Carries on fairly good conversation
N S V 14. Has normal ability to communicate for his/her age

II. Sociability:
[N] Not descriptive [S] Somewhat descriptive [V] Very descriptive

N S V 1. Seems to be in a shell – you cannot reach him/her
N S V 2. Ignores other people
N S V 3. Pays little or no attention when addressed
N S V 4. Uncooperative and resistant
N S V 5. No eye contact
N S V 6. Prefers to be left alone
N S V 7. Shows no affection
N S V 8. Fails to greet parents
N S V 9. Avoids contact with others
N S V 10. Does not imitate
N S V 11. Dislikes being held/cuddled
N S V 12. Does not share or show
N S V 13. Does not wave 'bye bye'
N S V 14. Disagreeable/not compliant
N S V 15. Temper tantrums
N S V 16. Lacks friends/companions
N S V 17. Rarely smiles
N S V 18. Insensitive to other's feelings
N S V 19. Indifferent to being liked
N S V 20. Indifferent if parent(s) leave

III. Sensory/Cognitive Awareness:
[N] Not descriptive [S] Somewhat descriptive [V] Very descriptive

N S V, 1. Responds to own name
N S V 2. Responds to praise
N S V 3. Looks at people and animals
N S V 4. Looks at pictures (and T.V.)
N S V 5. Does drawing, coloring, art
N S V 6. Plays with toys appropriately
N S V 7. Appropriate facial expression
N S V 8. Understands stories on T.V.
N S V 9. Understands explanations
N S V 10. Aware of environment
N S V 11. Aware of danger
N S V 12. Shows imagination
N S V 13. Initiates activities
N S V 14. Dresses self
N S V 15. Curious, interested
N S V 16. Venturesome - explores
N S V 17. "Tuned in" — Not spacey
N S V 18. Looks where others are looking

IV. Health/Physical/Behavior:
Use this code: [N] Not a Problem [MI] Minor Problem [MO] Moderate Problem [S] Serious Problem

N MI MO S 1. Bed-wetting
N MI MO S 2. Wets pants/diapers
N MI MO S 3. Soils pants/diapers
N MI MO S 4. Diarrhea
N MI MO S 5. Constipation
N MI MO S 6. Sleep problems
N MI MO S 7. Eats too much/too little
N MI MO S 8. Extremely limited diet
N MI MO S 9. Hyperactive
N MI MO S 10. Lethargic
N MI MO S 11. Hits or injures self
N MI MO S 12. Hits or injures others
N MI MO S 13. Destructive
N MI MO S 14. Sound-sensitive
N MI MO S 15. Anxious/fearful
N MI MO S 16. Unhappy/crying
N MI MO S 17. Seizures
N MI MO S 18. Obsessive speech
N MI MO S 19. Rigid routines
N MI MO S 20. Shouts or screams
N MI MO S 21. Demands sameness
N MI MO S 22. Often agitated
N MI MO S 23. Not sensitive to pain
N MI MO S 24. "Hooked" or fixated on certain objects/topics
N MI MO S 25. Repetitive movements (stimming, rocking, etc.)

Table 1 – Pre and post treatment findings are noted by the chiropractic initial examination and re-evaluation

	Pre Treatment	Post Treatment
Subluxation Pattern (Spinous Listing)	R Ilium PIEX, T2 PL, C2 PL	R Ilium PI, Anterior T5/T6, C6 PR
Range of Motion	Cervical Left Rotation 40◦/80◦, Cervical Left Lateral Flexion 20◦/40◦	All ROM within normal limits
Trigger Points	Tender and Spastic Trapezius Trigger Points	Mild Trapezius Hypertonicity
Postural Analysis	R Head Tilt, R Elevated Shoulder, R Foot Internal Rotation	Posture within normal limits
Medication Usage	Ritalin	None

Figure 2 – A graphical representation of the % impairment improvements pre and post treatment as noted by the Autism Treatment Evaluation Checklist