

CASE STUDY

Resolution of Childhood Nocturnal Enuresis Following Subluxation-Based Chiropractic Care: A Retrospective Case Report

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Abstract

Objective: Case study of resolution of nocturnal enuresis following the introduction of subluxation based chiropractic care in a pediatric patient.

Clinical Features: An 11-year-old boy with a history of nocturnal enuresis and attention problems was determined to have subluxations noted during chiropractic examination.

Intervention and Outcomes: Contact-specific, high velocity, low-amplitude adjustments (Gonstead technique), as well as Activator instrument adjustments, were applied at sites of vertebral subluxations at the C₂, C₆, T₁, T₅, T₁₂, L₃, L₅ and pelvic segments. The patient and mother reported a significant decrease in episodes of bedwetting and an improvement in his attention problems.

Conclusions: The chiropractic care of a patient presenting with nocturnal enuresis and attention problems is presented. There was significant decrease in episodes of bedwetting and a marked increase in attentiveness. This is one of few studies regarding chiropractic care and its effect on childhood bed wetting. More studies need to be performed in order to further explore chiropractic's role in the management of enuresis.

Key Terms: *Chiropractic, pediatric, enuresis, ADHD, bedwetting, vertebral subluxation*

Introduction

Nocturnal enuresis is more commonly known as bedwetting. It is an extremely common problem in children, affecting approximately 10 – 20.4% of children up to 7 years old, with a spontaneous cure rate of 15% per year. 2.3% of childhood bed wetters become adult bedwetters.¹ Bedwetting is an extremely difficult problem to deal with for both girls and boys. According to Butler, “between 15-22% of boys and

7-15% of girls wet the bed at 7 years of age reducing to approximately 1-2% in the later teenage years.”² Primary nocturnal enuresis is considered present when there is at least one wet night per month in children over 5 years old.¹ According to the DSM-IV, marked primary nocturnal enuresis is considered in children aged 5 years or more who wet their bed at least two nights a week.³ Not only is bedwetting hard to deal with for children, it is also hard for their families. “Washing bed linens, changing bedclothes, replacing

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mattresses, etc., are considered a significant burden of additional time, effort, and financial impact by these families.^{3,4}

It has been shown that there is a clear correlation between nocturnal enuresis and disruptive behavior.⁵ It has also been shown that there is a higher prevalence rate of ADHD in an enuretic population compared to community samples.⁶ Even though there are many ways to treat nocturnal enuresis only relatively few are justifiable in terms of empirical data.⁷

Case Report

The patient presents as an 11 year old male brought to a chiropractor for his symptoms of bedwetting seven nights per week and attention problems as described by his mother. Both of these complaints have been present for his entire life. His history includes a non-traumatic vaginal hospital birth. He currently plays flag football and hockey. During his lifetime, the subject has had 5-10 total courses of antibiotics, and 5-10 total prescription medications, none of which have been in the past 6 months. He is right hand dominant, weighs 150lbs, and is 5 feet tall.

Upon initial examination posture analysis of the subject revealed a left head tilt (-R ^{h/z}), left lateral flexion of the thorax (-R ^{l/z}), and left lateral flexion of the pelvis (-R ^{p/z}). His weight distribution was 70 lbs on the left and 80 lbs on the right. His grip strength was equal at 40 lbs per hand. His range of motion was as follows: cervical flexion 50°; cervical extension 60°; left cervical lateral flexion 40°; right cervical lateral flexion 45°; left and right cervical rotation 80°; lumbar flexion 75°; lumbar extension 20°; and left and right lumbar lateral flexion 25°.

Orthopedic examination revealed tight musculature of the upper trapezius muscles while performing the Shoulder Depressor test bilaterally. When performing the Soto-Hall test he had pain in his upper thoracic region. He had slight pain when performing the Double Leg Raiser and pain in his left hip with the Patrick-Fabere test.

X-rays revealed misalignments at C₂, C₆, T₅, T₁₂, L₃, L₅ with a listing of PL (-ΘY), T₁ with a listing of PR (+ΘY), and pelvis with a listing of PI(-Z, -ΘX) in the left innominate and AS(+Z, +ΘX) of the right innominate. Motion and static palpation were also used; abberant motion, hypomobility/fixation, pain, tenderness, and restriction were found at these same levels. These criteria, in addition to left-side + Derefield leg check with a short leg on the left, were used to diagnose the vertebral subluxations. Cooperstein states that the short leg found with the patient in the prone position and the knees at 90° of flexion is associated with pelvic asymmetry.⁸

Treatment included Gonstead technique, using contact-specific, high-velocity, low-amplitude adjustment procedures, and Activator instrument adjusting.^{9,10} The listing of PI (-Z, -ΘX) of the left innominate was adjusted in the side posture position contacting the ilium. The listing of AS (+Z, +ΘX) of the right innominate was adjusted in the side posture position contacting the ischium. The T₁₂, L₃, L₅ segments with a listing of PL (-ΘY) were adjusted using the Activator instrument on the transverse processes of each segment. The T₁ segment

with a listing of PR (+ΘY) and the T₅ segment with a listing of PL (-ΘY) were adjusted with the patient in the prone position using a single hand contacting the transverse process of each segment. The C₂ and C₆ segments with a listing of PL (-ΘY) were each adjusted with the patient in the supine position using a spinous process contact.

The patient was seen a total of 33 times. Assessments at each visit included abberant motion, hypomobility/fixation, pain, tenderness, restriction, Derefield leg check and evaluation of short leg. Throughout care his bedwetting dramatically improved from 7 days per week to one time every two-three weeks. His attention problem also improved as reported by the patient and his mother.

Discussion

According to Yeung et al., the frequency and severity of wetting episodes gets progressively worse as age increases; and someone presenting with severe symptoms is much more likely to have problems persisting into their adult lives. At age 5 years only 14.3% of enuretic children wet 7 nights/week, compared with 48.3% at 19 years old.¹¹

Although previous studies support the idea that spontaneous resolution occurs during childhood and adolescence, enuresis can continue into adulthood. A previous epidemiological study of primary nocturnal enuresis in adolescents and adults up to 40 years old demonstrated that prevalence of primary nocturnal enuresis is static with no significant decrease after the age of 10 years old. Greater than two percent of both men and women remain enuretic into their adult years.¹¹ Therefore, it is important to closely observe the development, frequency, and severity of enuresis in these children.¹² It is of greater importance in cases such as the boy in this paper because the subject is 11 years old at the beginning of chiropractic care when the chance of spontaneous resolution is decreased.

One literature review endorsed nocturnal enuresis as a “difficulty” for children. Factor analysis showed that nocturnal enuresis is constructed as a social problem. This problem is different for girls compared to boys. Girls are more likely to consider the social and emotional aspects as the difficulty. Boys rated the antisocial events as more difficult.¹³ Our patient is a male with a higher chance of having high problem scores. According to Butler, the chance of an enuretic boy to have increased problem scores on a behavioral rating scale is twice as high as that for an enuretic girl.¹⁴

There have been many studies that demonstrate “a clear correlation between enuresis and disruptive behavior and anxiety disorders in children.”¹⁵ According to Ward-Smith, among the children who suffer from nocturnal enuresis, a majority of them do not show psychological disorders. This suggests that bedwetting is the cause of this psychological distress for the child, not the result of psychological distress.¹⁵ Baeyens has showed that about 15% of all enuretic children were diagnosed with the full syndrome of ADHD, an additional 22.5% and 2.5% met the DSM-IV criteria of ADHD predominantly inattentive and predominantly hyperactive/impulsive subtypes, respectively.¹⁶ This correlation between ADHD and nocturnal enuresis also seems

to become more severe as age increases. In 6-12-year old children admitted to a university hospital setting for nocturnal enuresis. This finding was most pronounced in 9- to 12-year old children mainly in relation to attention problems.¹⁶ Although the patient in this study has not been diagnosed with the full syndrome of ADHD, he has demonstrated attention problems.

Due to his age, sex, and severity of symptoms, the subject's chances of developing attention problems becomes increased in comparison to younger age groups. Probability of symptoms of nocturnal enuresis into his adult years is also increased and because of his age, he is less likely to experience a spontaneous resolution.

There are many management and treatment options for nocturnal enuresis. These management strategies include lifting which involves the parent lifting the child and carrying him to and from the toilet without ever waking the child from sleep. Other options for the family of an affected child include restricting drinks before bed, regular daytime toilet trips, rewards for staying dry, protective undergarments, and showing displeasure. The treatment interventions may include alarm, medication, homeopathy, hypnosis, and health worker advice.² Since ADHD has shown correlation with enuresis patients could benefit from multi-disciplinary treatment focusing on both disorders simultaneously.⁶

The normal neurologically intact urinary system is very complex, and "coordinating volitional control with the sympathetic and parasympathetic neurological processes involved can be challenging for children. Most children achieve this by 3 years old. Children tend to gain control over daytime urination before gaining control over night time urination.¹⁷

According to Adis International Limited, normal urinary filling or storage involves the cerebral cortex as the inhibitor to the bladder along with the sympathetic nervous system increasing outlet resistance at the bladder neck and inhibiting parasympathetic activation.¹⁷ In a study on normal urination of infants those subjects who woke before urination, and therefore were not bedwetting due to being aware of the urge of urinating demonstrated signs of the activation of various brainstem and cortical structures.¹⁸

This study also showed how the autonomic nervous system is affected by the sleep state. The activity of the autonomic system is profoundly affected by the sleep state. AS [active sleep] is characterized by high sympathetic tone, whereas during QS [quiet sleep] parasympathetic activity is higher. This relationship is especially marked among infants and children.¹⁸

Active sleep is equivalent to rapid eye movement (REM) sleep in adults and quiet sleep is equivalent to non-REM sleep.¹⁸ "It is well established that the voiding reflex is initiated by parasympathetic detrusor stimulation and sympathetic inhibition. As a consequence, bladder voiding mostly occurs during QS."¹⁸ The pathophysiology that causes nocturnal enuresis is complex, involving many different factors.¹⁶

In chiropractic, a vertebral subluxation is a biomechanical

change in the spinal column that causes neurological complications. Although medical authorities acknowledge that neurological complications may result from subluxation, classic chiropractic definitions mandate the presence of a neurological component.¹⁹ Because of these neurological complications chiropractic care not only has an effect on musculoskeletal disorders but may affect visceral function as well.

Hawk shows evidence from controlled studies that support chiropractic care as providing benefit to patients with such symptoms as asthma, cervicogenic vertigo, and infantile colic. The evidence is also promising for potential benefit of manual procedures for children with otitis media and elderly patients with pneumonia.²⁰ It could be suggested that due to the autonomic and cortical aspects of control of micturation, the neurological component of vertebral subluxation could have an effect on normal urinary control. Based on this relationship, reduction of the vertebral subluxation may reverse the neurological deficits to restore normal function to the urinary system and relieve associated behavioral problems.

Conclusion

The patient reported on in this case presented with nocturnal enuresis and associated attention problems. He was diagnosed with vertebral subluxations by his chiropractor. These vertebral subluxations were reduced using a series of chiropractic adjustments and his symptoms started to significantly improve. There are very few studies regarding chiropractic care and its effect on childhood bedwetting.²¹⁻²³ In order to determine the role of chiropractic in the management of enuresis more research needs to be conducted in this area.

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