

CASE STUDY

Resolution of Nocturnal Enuresis Following Adjustment of Vertebral Subluxations: A Case Report

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Abstract

Objective: To describe the successful chiropractic care of a child with nocturnal enuresis and vertebral subluxation.

Clinical Features: A 10-year-old female presented for chiropractic care with a history of nocturnal enuresis of 6 years duration that began after a urinary tract infection was treated with multiple courses of antibiotics.

Intervention and Outcomes: The framework of detection and removal of spinal subluxations using Activator Methods and Torque Release Technique was applied at twice per week for a total of 5 patient visits. Improvement in the patient's nocturnal enuresis was observed following 2 visits that continued with follow-up care and observation.

Conclusions: This case report provides supporting evidence that patients with nocturnal enuresis may benefit from chiropractic care.

Key words: *Chiropractic, nocturnal enuresis, vertebral subluxation, adjustment, spinal manipulation*

Introduction

Defined as bedwetting frequency of >3 wet nights per week, nocturnal enuresis has an estimated prevalence of nearly 10% in children aged 7 years.¹ The disorder affects about 5 to 7 million children in the US and 200,000 in Canada, with a higher percentage in younger age groups.^{2,3} The pathophysiology of nocturnal enuresis is not well understood, with explanations often involving the central nervous system with many neurotransmitters and receptors indicated, circadian rhythm, and bladder function derangements.

Medical treatment often employs Desmopressin, which needs to be carefully monitored by parents for hyponatremia/water intoxication symptoms and alarms or bells as behavioral treatments. In the creation of a consensus guideline in the medical care of children with NE, Vande Walle et al.¹ found that medical treatment of nocturnal enuresis "is neither optimal nor efficient, which can have a profound impact on affected children and their families." Nocturnal enuresis has a spontaneous resolution in about 10-20% affected children³ but in most, it can also persist into adolescence and can become particularly difficult to treat as the child matures. Urinary tract infections are associated in approximately 10% of adolescent cases.⁴ Nappo et al.⁴ advocate that enuretic children should receive adequate treatment before reaching

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adolescence to prevent the difficulty of treating this problem as the child matures. Given the state of medical care for these children, alternative therapies become an attractive option for children and their parents. There is supporting evidence in the scientific literature on the chiropractic care of children with nocturnal enuresis, in addition to other non-musculoskeletal childhood conditions.⁵⁻⁶ To further contribute to evidence-informed practice, this case report describes the chiropractic care of a patient with secondary nocturnal enuresis of a child following a bout of urinary tract infection and ankle sprain.

Case Report

A 10-year-old girl was presented for chiropractic consultation and possible care after recurrent right ankle sprains and primary nocturnal enuresis. The child's bedwetting began after a urinary tract infection at 4 years of age and was "on and off" for 6 years and treated with 4 courses of 7 day cycles of antibiotics. The patient's mother cannot recall what medications were prescribed for her daughter, but did say the last cycle was for antibiotic resistant *Escherichia Coli*. The patient's mother noted that her daughter's nocturnal enuresis started after the patient began taking the antibiotics. The parent denied a family history of enuresis or incontinence. The patient was experiencing wet nights at a frequency of 5 times per week or more at the time of chiropractic consultation. According to the girl's mother, the child's antibiotic treatment had ended two weeks prior to presentation. The patient's diet consisted of plenty of fruits and vegetables, whole grains, protein, and minimal sugar and fried foods. The patient's mother found that bedwetting worsened around the holidays that she attributed to her daughter's extra sugar intake. The patient played sports nearly every day and was active on days without scheduled sporting events.

Chiropractic examination revealed an active 10-year-old girl with a swollen right ankle. Postural examination from the sagittal plane revealed a left head tilt and no curvatures. Active cervical spine range of motion (ROM) was decreased bilaterally with rotation. Static palpation of spinal segments revealed taut and tender paraspinal muscles at the C₁, L₄ and right Sacroiliac (SI) joint with edema at the L₄ vertebral level. A positive Cervical Syndrome Test and Derefeld leg checks were observed on the right side. In addition to the aforementioned examination procedures, paraspinal surface electromyography (sEMG) and rolling paraspinal thermography were used to complement the examination procedures (see Figure 1 and 2). The sEMG indicated hypertonicity of paraspinal muscles in the lower cervical and lower thoracic spine. The thermography scans revealed abnormalities in the lower cervical, thoracic and lumbosacral areas.

Based on the history and physical examination findings, the patient's mother consented for a trial of chiropractic care. The patient's initial chiropractic care was set at a frequency of 2 visits per week for 8 visits. However, the patient was only able to attend 5 times at the set duration of care. The patient was re-examined at once per week following her initial care and then two weeks thereafter. Re-examination revealed decreased fixation in pelvis, improved range of motion in cervical spine, decreased postural distortion, and tight lower

thoracic paraspinal muscles linked by the patient to a heavier backpack than normal. The techniques used were Activator Methods⁷ and Torque Release Technique.⁸ The first visit's adjustment revealed subluxations at right occiput, right sacrum, left fifth lumbar and eighth thoracic vertebrae. Upper cervical spine and sacrum was involved in every adjustment.

Following the patient's first set of adjustments, patient's mother reported that her daughter only experienced 1 wet night of bedwetting. In addition, the patient's mother reported that her daughter had increased urgency on the car ride home following chiropractic care, for which they had to pull over immediately and run into the nearest restroom. Following the patient's second visit, the patient's mother reported that her daughter experienced no more wet nights and no more increased urgency. The patient has had all dry nights since her second visit over a 4-month duration. Given the success of chiropractic in addressing the child's complaint of nocturnal enuresis, her parents elected to place their daughter on a wellness chiropractic care program.

Discussion

Nocturnal enuresis affects approximately 10% of all children at 7 years of age, with decreases in population of children affected at older ages. As millions of children have the condition, little is truly understood about its cause and medical interventions often lack effectiveness.¹ When left unresolved in childhood, adolescents may continue night time bedwetting and can be very difficult to manage.⁵ While there is on occasion reported spontaneous resolution, it has been found that this probably only applies to children with mild symptoms, which is defined as less than 3 wet nights per week of bedwetting.⁹ At 5 years of age, 2% of children wet every night, and 1% are still wetting every night into their late teenage years.¹⁰ Given the effect of compromising the quality of life and risk for psychological and physical abuse in these children¹¹, there is a need for an integrative approach to their care. More research, including those describing the alternative clinical encounter as in this case report, will inform such an integrative approach.

In the realm of the chiropractic clinical encounter, case studies have been published that show similar clinical changes in wet night frequency following very few chiropractic adjustments¹²⁻¹³, while others may follow children for weeks to months of chiropractic care resulting in significant decrease in symptoms.¹³⁻¹⁴ While one aspect of chiropractic care is not dependant on symptomatology¹⁵, many chiropractors have found that many issues involving both musculoskeletal (MSK) and non-MSK disorders have ameliorated with the detection and removal of spinal subluxations as a framework.⁶ Indeed, this clinical and theoretical paradigm renders chiropractic unique from all the professions that apply "spinal manipulative therapy" as part of their armamentarium of patient care. The World Health Organization defines subluxation as "A lesion or dysfunction in a joint or motion segment in which alignment, movement integrity and/or physiological function are altered, although contact joint surfaces remains intact. It is essentially a functional entity, which may influence biomechanical and neural integrity."¹⁶ Even though chiropractic care is often simply associated with the improvement of spinal pain symptoms, there is a myriad of

research as documented in this Journal that suggest that the removal of subluxations and improvement of spinal function through chiropractic can affect much more than pain symptoms. Consider the studies by Alcantara and colleagues¹⁷⁻¹⁸ that found in addition to improvement in presenting symptoms, children under chiropractic care were found to have improved immune functions, better sleep and improved attitudes.

In terms of the chiropractic lesion perspective, models of subluxation when combined with motor control theories suggest that dysfunctional segments (i.e., spinal misalignment) in the spine can cause ligamentomuscular reflexes as well as somatosympathetic reflexes that alter local vasomotor and sudomotor control, and potentially end organ function.¹⁹ Consider that a subluxation of the sacrum may affect the proper functioning of the pelvic splanchnic (S₂₋₄) nerves. The pelvic splanchnic nerves (S₂₋₄) innervate the pelvic viscera through the vesical, prostatic, rectal, uterovaginal, and inferior hypogastric plexus. Pelvic splanchnic nerve (PSN) stimulation causes the urinary bladder wall to contract and relax the internal sphincter urethrae muscles to allow void of urine.²⁰ It is possible that activation of the PSN at inappropriate times (i.e., during sleep) could be caused by sacral subluxations.

The theoretical and clinical framework approach (i.e., Torque Release Technique and Activator Methods) here was based on the premise that spinal subluxations can be segmental/neurological or tonal. Segmental subluxations involve nerve root pressure, from which research has shown that a pressure of 5-10mmHg can disrupt venous blood flow to spinal nerve roots as well as their action potentials.²¹ The tonal model of chiropractic subluxations posits an improper spinal cord tension. This tension affects somatosensory evoked potential, as well as blood supply and perfusion to the cord, brainstem and cranial nerves, neurogenic motor potentials, and mitochondrial metabolism.²² These tonal subluxations are affected during TRT analysis by targeting the vertebra with dural attachment to the cord. Tonal subluxations are considered the primary target to address during chiropractic care, as cord tension can lead to segmental (secondary) subluxations.

As the spine of children and adults have definite structural/biomechanical differences, certain emphasis must be placed on the safety and efficacy of the chiropractic care for children. With regards to safety for children receiving chiropractic adjustments, a literature review performed by Doyle²³ found a mild adverse event (AE) rate of 0.53 to 1% chance after an adjustment is performed by a chiropractor. Placed into context, osteopathic manipulation has been reported to result in mild AE prevalence of 9%.²⁴ Based on the published literature thus far, chiropractic care is safe for children with the acknowledgement that AEs may be under-reported, as with all healthcare interventions. As there have been very few randomized control studies with regards to the topic of enuresis and chiropractic care, this case provides a measure of evidence and clinical encounter. It is not meant to be generalized to treatment of any other individuals, but will hopefully provoke more research into the mechanism by which chiropractic care may be able to help with nocturnal enuresis or other visceral disorders involving children.

Traditional caveats with respect to research methodologies necessitates our acknowledgement that case reports lack generalizability due to confounders (i.e., lacking a control group, spontaneous remission, self-limiting course and natural history of the disorder, subjective validation, and expectations for clinical resolution). However, from a constructivist research orientation, we would argue that the findings reported in this case report are epistemologically in harmony with our clinical experiences and those of our patients. Traditionally, this has formed the basis for generalizations and affirmed our conviction on the effectiveness of our care approaches.

Conclusion

We described the resolution of nocturnal enuresis in a child receiving chiropractic care following 2 patient visits. This case provides supporting evidence that chiropractic care may provide help to patients with similar complaints. We support more research to evaluate the cause and effect relationship of chiropractic care and restoration of healthy physiology in children and adults, including amelioration of nocturnal enuresis.

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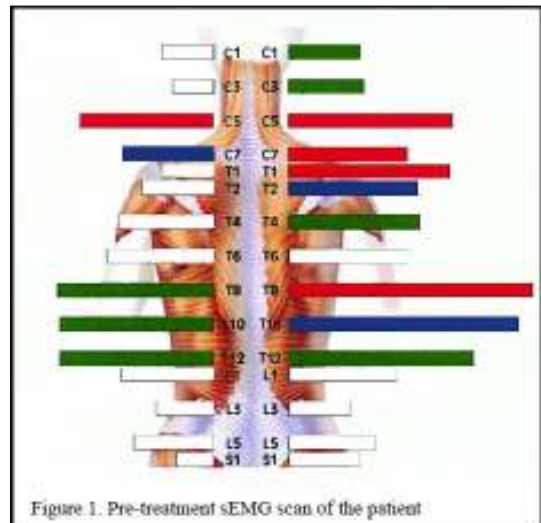


Figure 1. Pre-treatment sEMG scan of the patient

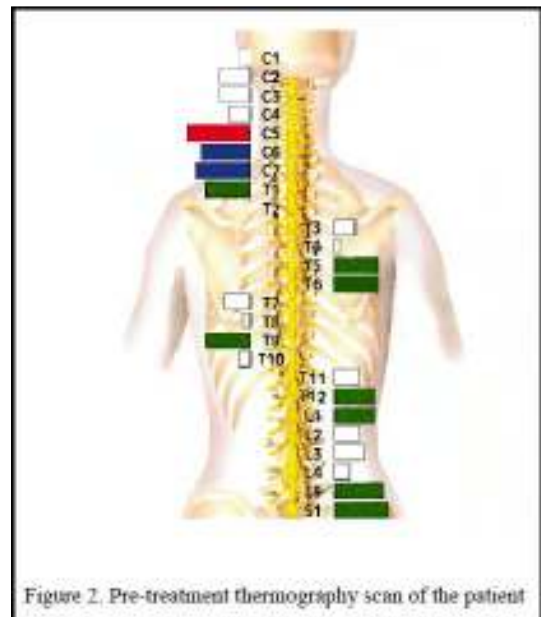


Figure 2. Pre-treatment thermography scan of the patient