Cessation of cyclic vomiting in a 7-year-old girl after upper cervical chiropractic care: a case report

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Abstract

Objective: The purpose of this case report is to describe chiropractic management of a child with cyclic vomiting syndrome.

Clinical Features: A 7-year-old girl had a history of cyclic vomiting episodes for the past 4 1/2 years. She also had a 2-month history of headaches and stomachache.

Intervention and Outcome: The patient received low-force chiropractic spinal manipulation to her upper cervical spine. There was improvement in her symptoms within an hour after the chiropractic manipulation. Her symptoms only returned after direct trauma to her neck. The recurring symptoms again disappeared immediately after treatment.

Conclusion: This case study suggests that there may be a role for the use of chiropractic spinal manipulative therapy for treating cyclic vomiting syndrome. Controlled studies are necessary to aid our understanding of this finding.

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Introduction

Cyclic vomiting syndrome (CVS) is defined as fits of self-limiting vomiting, lasting minutes to hours to even days at a time, which are reoccurring^{1,2} and affect mainly preschool children.^{2,3} It is second only to gastroesophageal reflux as the most common cause of recurrent vomiting,² affecting 1.9% of school-aged children.⁴ It has also been described as a migraine-equivalent disease^{2,3}; and in one third of the patients, the CVS will evolve to a migraine headaches.^{3,5} The

symptoms are usually relieved by sleep, but most children will continue vomiting after they awake.¹ It is important, when caring for these children, to remember that during the symptomatic episode, the child may become dehydrated and dangerously ill.¹

Current understanding of CVS is that the disease has 2 sets of criteria: essential and supportive.¹ The essential criteria “include recurrent, severe, discrete episodes of vomiting, with varying intervals of normal health between episodes.”¹ The supporting criteria “include vomiting episodes and patterns which are similar to each other within each individual case.”¹

The diagnosis of CVS is difficult because there are no specific diagnostic tests and is therefore based on the combination of the patient’s history and examination.¹

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All laboratory and radiographic studies are typically negative for pathology.^{1-3,5} Cyclic vomiting syndrome has no specific treatment or specific management.² Today, the accepted diagnosis of CVS includes 3 or more recurrent episodes of vomiting, varying intervals of normal health between episodes, stereotypical episodes that are repetitive with regard to symptom onset and duration, and the absence of laboratory and radiographic findings.²

This case report discusses the chiropractic care of a 7-year-old girl who had CVS for the past 4 1/2 years and had begun to experience headaches of a 2-month duration.

Case report

A 7-year-old female patient reported to the clinic with migraine headaches and with midback and abdominal pain for the past 2 months. She had been diagnosed with CVS by her gastroenterologist 9 months before seeking chiropractic care. She was experiencing cyclical vomiting episodes once every 1 to 2 months. The episodes lasted 12 to 20 hours; and 8 episodes required hospitalization, all of which were preceded by illness or stress. The CVS episodes consisted of uncontrolled vomiting, leaving her dehydrated, and, in the cases that resulted in hospitalization, required the intravenous replacement of fluids.

She originally saw a gastroenterologist at 10 months of age for weight loss and failure-to-thrive. She was diagnosed with gastroesophageal reflux disorder (GERD) and placed on Reglan (metoclopramide) (ESI Lederle Generics, Philadelphia, PA), Pepcid (famotidine) (Johnson and Johnson, New Brunswick, NJ or Merck and Co., Whitehouse Station, NJ), Zantac (ranitidine HCl) (GlaxoSmithKline, Middlesex, United Kingdom), and Periacin (cyproheptadine) (Merck and Co.), with specific feeding instructions. At the time of diagnosis, she underwent an upper endoscopy and small bowel biopsy, the results of which were shown to be normal. At 17 months of age, she continued to fail to gain weight, leading her physician to state that she was not having adequate energy intake. At this time, all of her medications were stopped. Her physician recommended that she should be hospitalized for nasogastric tube feeding and that her thyroid levels be checked. Both recommendations were refused by her parents.

From the age of 17 months until 6 years, she was admitted to the hospital 8 times for episodic vomiting. Nine months before beginning chiropractic care, she

underwent a repeated upper endoscopy and small bowel biopsy, the results of which were normal. She was again diagnosed with GERD and CVS and placed on Reglan (metoclopramide), Zantac (ranitidine HCl), and Periacin (cyproheptadine), with little relief.

Our examination revealed pain in the upper cervical, suboccipital, occipital, trapezius, and frontal regions of her head and neck upon palpation. The patient, using the Faces Pain Scale,⁶ rated her pain level at 8 of 10 for her abdominal pain; her headache was rated at 6 of 10. The pain was described as sharp in nature, intermittent throughout the day, and worse at night. She also described feeling nauseous and finding it difficult to swallow.

Palpation of her cervical spine revealed tenderness and hypomobility of the occiput through sixth cervical vertebrae. Her suboccipital musculature was taut and guarded on the right side. Cervical range of motion was mildly limited in all directions except for flexion. Palpation of the thoracic spine revealed tenderness, and an abnormal curvature of the thoracic spine was visible upon Adam forward bending test. The patient was apprehensive and guarded throughout a palpation examination in which fixation of the atlantooccipital joint was found. Cervical radiographs were ordered using the Blair chiropractic technique protocol⁷ to guide management and treatment.

She received an 8-week course of chiropractic low-velocity, low-amplitude adjustments, following upper cervical pediatric protocol.⁷ She received 7 treatments

Fig 1. C1 adjustment performed with the tip of the chiropractor's thumb gently pressing on the transverse process of the patient's C1.

Table 1 Symptoms and reaction to SMT of care for the first 8 weeks

Visit	Symptoms	SMT	Response to SMT	Noted trauma before symptoms returned
1	Stomach- and headache	LVLA C1	Stomachache relieved 5 min following SMT	None
2	None	LVLA C1	Tolerated well/no symptoms after SMT	None
3	None	No SMT	NA	None
4	None	No SMT	NA	None
5	None	LVLA C1	Tolerated well/no symptoms after SMT	None
6	Cyclic vomiting episode	LVLA C1	Episode stopped within an hour after the SMT as verbalized by mother	Jumping on trampoline earlier that day
7	Stomachache	LVLA C1	Stomachache relieved within an hour as verbalized by mother	Ran into mother with her head
8	None	LVLA C1	Tolerated well/no symptoms after SMT	None
9	None	LVLA C1	Tolerated well/no symptoms after SMT	None
10	None	No SMT	NA	None
11	None	No SMT	NA	None
12 ^a	None	No SMT	NA	None
13	None	No SMT	NA	None

LVLA, low velocity–low amplitude; NA, not applicable.

^a Patient taken off all medications by medical doctor.

to the C1 vertebrae over 13 visits, with no report of adverse symptoms after these treatments. Each adjustment was with the patient in the supine position. A light force was applied in a 45° anteroposterior, right to left direction at a 90° and 45° superior to inferior direction over the right C1 transverse process (Fig 1). The directional misalignment was determined as an anterior-right misalignment by using pediatric Duff analysis (as described by Forest⁷) on her upper cervical radiographs. The patient reported and the mother confirmed relief of head- and stomachache no more than 1 hour after the first adjustment. She received 2 adjustments to her C1 vertebrae during this time, once when she was experiencing a cyclic vomiting episode and the other while she had a stomach ache. Both symptomatic episodes followed a trauma to the patient's neck (Table 1). In both cases, the symptoms were relieved within an hour following spinal manipulative therapy (SMT). At 20 months of follow-up after the initial 13 patient visits, it was reported that the patient has not experienced any other CVS episodes. Her mother describes her as a “normal child” who is no longer on any medications for cyclic vomiting, GERD, or headaches.

Discussion

This case is interesting because the patient experienced immediate relief following chiropractic manipulation. It is possible that the SMT performed on this child may have affected the autonomic nervous system

(ANS). With the anterior-right misalignment assumed by the chiropractic radiographic analysis, there are 2 possible mechanisms of ANS irritation to consider. The first arises from anterior displacement of the C1 vertebrae, placing pressure or torsion on the carotid sheath containing the common carotid artery, internal carotid artery, internal jugular vein, and the glossopharyngeal, vagus, and spinal accessory nerves.^{8,9} The second mode arises from torsion or pressure upon the superior cervical ganglion located at the vertebral body of the axis and posterior to the carotid sheath.^{8,10} Chelimsky and Chelimsky⁴ report a study where the ANS was linked to CVS cases. All 6 patients studied had a personal or family history of migraine headaches. Our patient was currently complaining of migraine headache episodes. The 6 pediatric patients demonstrated normal cardiac parasympathetic and sympathetic innervation. However, result of a sudomotor test was abnormal in all 6 patients, suggesting autonomic neuropathy. Pickar¹¹ states that there is evidence demonstrating that SMT evokes paraspinal muscle reflexes and alters motoneuron excitability. He states that “sensory input from paraspinal tissues can evoke visceral reflexes affecting the sympathetic nervous system and may alter end-organ function.” Noxious paraspinal sensory input, which may be caused by the spinal segmental dysfunction, appears to have an excitatory effect on sympathetic outflow. This may produce the abnormal sudomotor test results found by Chelimsky and Chelimsky. Correcting the segmental dysfunction through SMT may normalize the sensory input, thus having an inhibitory effect on the somato-visceral reflexes.¹¹ Levine¹² states that cervical

spondylitic myelopathy may be caused by tensile stress transmitted to the spinal cord by the dentate ligaments that may cause stress at the lateral columns of the spinal cord. This stress may be the cause of noxious sympathetic input causing abnormal viscerosomatic effects.

To date, no specific therapy has proven to be effective for CVS in controlled trials.² Medical interventions include prophylactic therapy such as cyproheptadine (<5 years of age), and amitriptyline (>5 years of age).¹³ Acute therapy includes intravenous fluids with up to 10% glucose to limit ketosis.¹⁴ α -Blockade using dexmedetomidine and clonidine has been reported to be helpful.¹⁴ Other possible interventions include proton pump inhibitors or H2 receptor antagonists for children who have prolonged and/or frequent CVS episodes.¹⁴ Hikita et al¹⁵ found that the combination of valproate sodium and phenobarbital may be helpful for the prophylaxis of vomiting in patients with intractable CVS. However, the most common medical treatments have only inconsistent success.² Because of the lack of medical success with this patient, our approach was to focus on the upper cervical spine. Through clinical experience, we believed that this was the area that needed to be addressed. Once the vomiting begins, minimizing the symptoms involves attention to psychologic distress, severity of vomiting, and dehydration.¹⁴ Management includes care in a quiet room with minimal lighting.

When performing the chiropractic workup, the clinicians palpated the upper cervical spine; and because of the apprehension, sensitivity, and guarding of the patient, neither felt confident in obtaining a segmental misalignment listing by motion palpation alone. Therefore, we ordered pediatric radiographs using Blair chiropractic technique protocols for the management of this patient.⁷ It should be noted that it is not typical protocol to do radiographic examinations on every pediatric patient; yet in this case, we felt that it was necessary.

Limitations

Because this is a case report, one cannot assume that response to chiropractic care for this patient can be generalized to all cyclic vomiting patients. It is also possible that the patient's condition may have improved on its own due to the natural course of this disorder. It is uncertain if the chiropractic management was directly responsible for improvement; however, in the time line of treatment, it appears to be associated.

Conclusion

The possible relationship between the first cervical vertebrae misalignment and CVS is not yet known. No studies have been performed on the relationship between SMT and CVS. Based upon our clinical observations, there might be a correlation between the specific SMT and the patient's relief of symptoms.

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