A case study utilizing Vojta/Dynamic Neuromuscular Stabilization therapy to control symptoms of a chronic migraine sufferer

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Received 10 November 2010; received in revised form 21 December 2010; accepted 14 January 2011

Summary

Introduction: Migraine is a complex disorder of the brain characterized by severe headache, photophobia, phonophobia, and nausea. This case report demonstrated the reduction of a 49-year-old female’s chronic migraine symptoms after 12 weeks of Vojta/Dynamic Neuromuscular Stabilization (DNS) therapy.

Methods: Vojta/DNS treatment occurred either in the office or at home over a 12-week period. Symptoms were tracked via a patient diary, a VAS pain scale, and a Headache Disability Index (HDI).

Results: The patient’s migraine symptoms were typically of 3 days duration, a frequency of 8–10 times per month, and an intensity of 10/10 on a VAS pain scale. After a 12-week trial of Vojta/DNS care, subjective improvements were noted, with a reduction in frequency to 1–2 times per month, duration of 12 h at most, and decreased intensity to a 2/10 on a VAS pain scale. HDI scores dropped from 48% to 34%.

Discussion: This therapy reduced the patient’s migraine symptoms in frequency, duration and intensity. This therapy is not well-known in North America despite its use for over 40 years in Europe.

Conclusion: This case demonstrated that Vojta/DNS treatment over a 12-week period helped manage the patient’s migraines and could be a possible treatment option for future research.

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doi:10.1016/j.jbmt.2011.01.019
Introduction

Migraine is a complex disorder of the brain which is typically characterized by spontaneous attacks of unilateral, throbbing headaches which are often aggravated by movements (Messlinger, 2009), along with non-headache symptoms including photophobia, phonophobia, and nausea (Sprenger and Goadsby, 2009). These characteristic symptoms are found in all types of migraine, the most common types being migraine without aura, followed by migraine with aura (Messlinger, 2009). It has been found that nearly half of the world’s population has an active headache disorder and according to the American Migraine Prevalence and Prevention study of 2004 (Lipton et al., 2007), migraine in particular has a prevalence of 12% in the general population, 18% in women, and 6% in men (Robbins and Lipton, 2010). Migraine is reported to be among the top 20 causes of disability worldwide, as more than half of those affected have such severe symptoms that they cannot function normally in their routine daily activities, including work, school, and social activities (Brandes, 2009). 48.2% of migraineurs reported some level of impairment, 22.1% were severely disabled, and more than half reported the need for bed rest (Lipton et al., 2007). In addition, during the periods between attacks, worry, stress, and expectation of future attacks may also lead to functional impairment, a phenomenon known as the interictal burden (Brandes, 2009).

It is commonly noted that migraine attacks may be precipitated by a number of factors, which are often termed “migraine triggers.” Approximately 76% of migraine sufferers report identifiable triggers (Sauro and Becker, 2009). Reported triggers are widely varied, including hormonal changes in women — migraine headache is related to the menstrual cycle in about 60% of female patients (Lambert and Zagami, 2009) — certain foods, missing meals, weather changes, alcohol, and sleep disturbances. Fatigue is the most commonly reported trigger, with stress the second most common (Sauro and Becker, 2009). Additional triggers can include flickering lights, loud noises, strong smells, drugs which deplete the brain of the neurotransmitter serotonin, environmental changes — especially in temperature and barometric pressure — and for many patients no external trigger is apparent at all (Lambert and Zagami, 2009).

The variety of triggers and the individual nature of triggers have led to the hypothesis that only some kind of neural event can explain triggering. There is much evidence in the literature at this time to support the notion that migraine is more than a headache disorder, but instead is a pathophysiologically complex disorder that arises from a neurovascular disturbance in the brain itself, and involves modulatory mechanisms in the brainstem, subcortical, and cortical levels to process pain. These processing mechanisms may be abnormal in migraine, which uses otherwise normal neural pathways for pain transmission (Purdy, 2010). As depression travels slowly across the cerebral cortex (cortical spreading depression), trigeminal nerve terminals surrounding the meningeal arteries are stimulated, eliciting a trigeminovascular reflex that explains subsequent vascular changes and headache (Martins, 2009).

Migraine sufferers typically try a multitude of interventions in an effort to reduce the frequency and severity of their attacks as well as to improve function and reduce disability (Brandes, 2009). There are numerous pharmacological interventions, including beta-blockers, antidepresants, anticonvulsants, calcium channel blockers and serotonin antagonists, but side effects and contraindications because of co-morbidities can complicate treatment (Sprenger and Goadsby, 2009). Over half of the diagnosed migraineurs in the US use OTC analgesics, which are effective in up to 60% of cases (Whyte et al., 2010). Many migraine patients try manual therapies; primary choices are physical therapy, massage, and spinal manipulative therapy (Biondi, 2005). Recent reviews have shown physical therapy is most effective in combination with other therapies such as biofeedback, relaxation training, and exercise (Biondi, 2005). Massage therapy was shown to be beneficial in reducing frequency of migraine attacks, as well as improving perceived stress and coping efficacy (Lawler and Cameron, 2006). There is also some evidence indicating that spinal manipulation has effectiveness similar to a first-line prophylactic prescription medication (amitriptyline) for the prophylactic treatment of migraine (Bronfort et al., 2010). In addition, migraine patients also frequently use complementary and alternative medicine (CAM), with relaxation therapies and chiropractic care being the most common CAM therapies employed (Astin and Ernst, 2002). Additional alternative treatments include: vitamins and minerals such as riboflavin, niacin, and magnesium; supplements such as feverfew, butterbur, and coenzyme Q10; mind-body therapies such as biofeedback, cognitive behavioral therapy, guided imagery, “headache school,” self-hypnosis, meditation, and relaxation training; physical treatments such as acupuncture, massage therapy, physical therapy, and spinal manipulation; and lifestyle modifications such as food and alcohol elimination, aerobic exercise, and sleep hygiene (DynaMed, 1995).

Vojta/Dynamic Neuromuscular Stabilization Therapy (DNS) is a therapy used predominantly in Europe to manage neurological and musculoskeletal conditions (Laufens et al., 1999; Niethard, 1987; Böhme and Futschik, 1995; Bauer et al., 1992; Vojta and Peters, 2007). Vojta therapy was developed from 1955 to 1969 by a Czech pediatric neurologist Vaclav Vojta (Bauer et al., 1992; Vojta and Peters, 2007). His treatment approach in the broadest of terms involved utilizing digital pressure on specific points of the body to provide afferent stimulation to evoke genetically predetermined CNS motor programs to address various neurological-based conditions (Vojta and Peters, 2007). Since the mid-nineties, these treatment principles and approaches have since been modified by Pavel Kolár, a physiotherapist from the Czech Republic. His modified approach was eventually named Dynamic Neuromuscular Stabilization (Bokarius and Bokarius, 2008). The purpose of this case report is to demonstrate how the Vojta/DNS treatment approach greatly reduced diagnosed migraine symptoms over a 12-week period for a 49-year-old female who had consistently experienced intense frequent symptoms over her last 40 years.

Methods

The initial treatments consisted of Vojta/DNS therapy for 10–15 min in a supine position with the patient’s palms
placed down on the treatment table. The patient was positioned supine due the ease of maintaining cervical spine neutral posture. On general patient visual observation of the cervical spine on both standing and supine the patient had a slight left lateral shearing and rotation along with anterior head carriage. It was theorized that this postural aberration may have been the possible cause for the patient’s chronic symptoms. To neutralize this postural issue in the cervical spine, mild long-axis digital pressure was applied at the occiput to help hold the cervical spine in the neutral position while minimizing upper cervical hyperextension. This positioning maximized cervical spinal joint centration, ultimately relaxing overactive cervical muscles and establishing a neutral cervical spine posture. Along with this positioning, firm digital pressure was applied between ribs seven and eight at the mid-clavicular line directed towards the fourth thoracic vertebral body to provide proprioceptive afferent input as part of the treatment approach. Clinical judgment determined daily treatment times based upon a reduction of cervical tension to enhance neutral cervical posture; treatment times were longer in the initial stages of care as compared to the end stages of daily treatment times. Care was taken to apply firm pressure without causing a painful stimulus to the patient and that digital pressure did not cause any lateral bending, rotation, or shear in the thoracic spine to maintain a neutral spine. The above treatment procedure was performed on one side of the body for half the treatment time, then switched to the contralateral side based upon the patient’s cervical asymmetries (Kolár, 2007).

During the course of treatment, the patient’s initial Vojta/DNS treatments started at 2–3 days of treatments each week for the first three weeks, then tapered to one treatment every 2–3 weeks until the last month of care when the patient was only seen once. At three weeks of care it was apparent that positive outcomes were obvious by patient report, at which time the patient’s spouse was trained to provide basic care at home on non-office days to enhance neutral cervical posture; treatment times were based upon a reduction of cervical tension to enhance neutral cervical posture; treatment times were longer in the initial stages of care as compared to the end stages of daily treatment times. Care was taken to apply firm pressure without causing a painful stimulus to the patient and that digital pressure did not cause any lateral bending, rotation, or shear in the thoracic spine to maintain a neutral spine. The above treatment procedure was performed on one side of the body for half the treatment time, then switched to the contralateral side based upon the patient’s cervical asymmetries (Kolár, 2007).

Results
Prior to treatment, the patient reported symptoms of intense headaches, light sensitivity, vision disturbances, vomiting, and fatigue which occurred 8–10 times per month and lasted consistently for three days. After a 12-week clinical trial, subjective improvements were noted, with a reduction of symptom frequency of one to two times a month, lasting at most 12 h in duration and with an eight-point reduction on a ten-point VAS pain scale. Headache Disability Index scores dropped from 48% to 34%. At one time during therapy, the patient was without migraines for a three-week period, which she recalled had never happened before.

Discussion
Vojta/Dynamic Neuromuscular Stabilization therapy has been utilized in the management of neurological and musculoskeletal conditions (Laufens et al., 1999; Niethard, 1987; Böhme and Futschik, 1995; Bauer et al., 1992; Vojta and Peters, 2007) throughout Europe, though it is not well known as a care option in North America. Vojta therapy has been applied roughly from the 1950s to present and was initially developed by the pediatric neurologist Václav Vojta (Bauer et al., 1992; Vojta and Peters, 2007). Through his clinical observation of the development of healthy infants, he noted a natural progression that they underwent for functional movements. He believed this was not a learned behavior but a genetically predetermined program that was expressed by the CNS as it developed (Vojta and Peters, 2007). Vojta’s clinical approach to less-than-ideal development movement patterns was to manually stimulate specific zones of the body to evoke genetically predetermined efferent motor expressions of the CNS to regain ideal movement patterns. This program was defined as “reflex locomotion” (Vojta and Peters, 2007). This approach was eventually applied to adults for numerous neuromusculoskeletal conditions. The principles and treatment methods were later expanded upon by Pavel Kolár, Director of the Rehabilitation Department at University Hospital Motol, in Prague, Czech Republic. Dr. Kolár added active components and loaded positioning to these methods to address dysfunctions and coined the name Dynamic Neuromuscular Stabilization (DNS) (Bokarius and Bokarius, 2008).

In this case, the patient had been diagnosed with migraines by two neurologists and three MRIs spanning a twenty-year period. She tried many treatment approaches with nominal results. She had tried upper cervical specific chiropractic care for an approximately three-month period of time with an occasional mild reduction of symptoms which would quickly return within a week. Also she had tried soft tissue release for two visits to address the hyperflexion of the upper cervical spine which greatly intensified the frequency, intensity and length of her migraine symptoms. The therapy she most utilized was OTC pain and headache medicines with only mild temporary results. She reported having “debilitating” migraines once to twice a year that would be relieved by Imitrex (triptan) injections.

Unfortunately, there exists little published Vojta/DNS literature on the concepts and treatment approaches, with even less articles written in English. The Vojta/DNS approach was considered in this case due to its proposed speculative ability to address global neurological disturbances at a subcortical level, based upon the concepts and treatment possibilities presented in printed materials (Laufens et al., 1999; Niethard, 1987; Böhme and Futschik, 1995; Bauer et al., 1992; Vojta and Peters, 2007; Kolár, 2007). With the theories of migraine as a pathophysiologically complex disorder that arises from a neurovascular disturbance in the brain itself, and involves modulatory mechanisms in the brainstem, subcortical and cortical
levels to process pain (Purdy, 2010), the authors postulated that it would appear worthy of a clinical trial for this patient’s particular condition utilizing Vojta/DNS therapy. Vojta/DNS care was also considered as a possible method of treatment due to her responses to other previous neuromuscular care. Although negative with the soft tissue treatment and only slightly positive with the upper cervical adjunctive care the authors speculated that a treatment in the cervical spine given the postural asymmetries could be minimized or eliminated from the neuromuscular impacts suggested in published articles (Bokarius and Bokarius, 2008; Laufens et al., 1999; Kolár, 2007).

The supine position was utilized to help facilitate global neutral positioning of the cervical spine to address left lateral shear and rotation along with anterior head carriage to reduce cervical postural asymmetries in hopes to impact symptoms. The stimulation point and body posture utilized is considered the most effective at facilitating sagittal stability (Vojta and Peters, 2007). Other beneficial reasons for the choice of this treatment position were its comfort for the patient and the relative ease of educating the patient’s husband to perform the appropriate positioning and treatment at home for an effective therapeutic response by a lay person.

Conclusion

This case demonstrated that Vojta/DNS treatment over the course of 12 weeks helped manage the patient’s migraines. This treatment approach demonstrated an effect on this patient’s condition by reducing the patient’s reported frequency, duration and intensity of symptoms along with reduced VAS pain scale and Headache Disability Index scores. Migraine is a disorder of the brain characterized by a complex sensory dysfunction, and as such, interventional neuromodular approaches with neural targets are most promising (Sprenger and Goadsby, 2009). Looking at migraine from a neurobiological approach, it would seem that any approaches which involve change or perturbation of the abnormal processes could reduce migraine symptoms (Purdy, 2010). The positive outcomes achieved in this case using the Vojta/DNS approach to addressing neurological disturbances have promising potential. Further research is needed to evaluate this clinical approach and its success in treating other patients with migraine disorders.

Conflict of interest

The authors declare that they have no conflict of interest.

References


