Chiropractic Treatment of Epilepsy/Seizure Disorders

A Literature Review

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ABSTRACT

Objective: To ascertain the efficacy of the chiropractic adjustment in treating epilepsy/seizure disorders.

Data collection: The information in this literature review has been obtained by reviewing related literature with emphasis placed on neocortical involvement in epileptic seizures as a window of treatment available to the Chiropractic doctor. This is not an experiment.

Results: Chiropractic adjustments are effective in decreasing the frequency and severity of seizures.

Conclusion: It has been hypothesized that the chiropractic adjustment is effective in treating epilepsy/seizure disorders via increasing the inhibitory function of cortical basket cells on pyramidal cells. More field research is needed to further substantiate this hypothesis.

INTRODUCTION

Epilepsy is defined as "*recurrent transient attacks of disturbed brain function. Characterized by various combinations of the following: motor, sensory, or psychic malfunction with or without convulsions; altered or complete loss of consciousness. Because convulsions are not a consistent finding in epilepsy, it is best to speak of epileptic seizures to describe all types of attacks.*" (1) A seizure is "*an abnormal behavior (with symptoms or signs) resulting from abnormal discharges of cortical neurons. It is an observable phenomenon which is finite in time.*" *(2) That is to say that a seizure can be diagnosed by direct observation.* In contrast to this, a syndrome is

"a cluster of symptoms and sings that occur together but, unlike a disease do not have a single known etiology or pathology."(2) Therefore, the epileptic syndrome, in contrast to a seizure requires more information in the way of patient history, family history, and age of onset, frequency, diagnostic imaging studies, precipitating factors and etiology. This is key in making a correct diagnosis and therefore increases the likelihood that the correct treatment is obtained.

There are many possible etiologies in the occurrence of epileptic seizures such as: (a) cranial trauma; (b) vascular malformations; (c) central nervous system lesions; (d) hypoxia; (e) and infection. (3) Regardless of the etiology, epileptic seizures are characterized by abnormal cortical discharges. When there is a lack of inhibition of cortical regions, an escape is allowed and depending on the area involved, we may see such escapes as absence, tonic-clonic, or myoclonic seizures.

Hauser states that every year in the United States alone there is an estimated 70,000 to 129,000 newly6 diagnosed epilepsy patients. (4) In the pediatric population, the prevalence is 4.3 to 9.3 per 1000 children. Of those, there are between 150,250 and 325,000 case between the ages of 5 and 14 years. The cases represented are only epileptic and do not represent febrile convulsions or unprovoked seizure events. (4,5). This disease is second only to strokes in prevalence of neurological diseases. About .5 to 1% of the population suffer from epilepsy.

There are two categories typically used when discussing epilepsy, partial and general. Partial (focal) epilepsy is used to describe a form of seizure that begins in a localizable area of the brain and may or may not spread to the adjacent cortex. The patient may or may not lose consciousness. In 1985, the International Classification of Epileptic Syndromes and Epilepsies (ICES) adopted the term localization related instead of partial or focal (6). This helped, as it is more descriptive than those seen previously, although one sees all three used in current literature.

DISCUSSION

Drug Therapy vs. Chiropractic Treatment

Epilepsy is a devastating disease and a certain stigma often follows those unfortunate enough to have this. Treatment occasionally consists of dietary changes, removal of precipitating factors, exercise and occasionally biofeedback training. Most frequently, anticonvulsant and anti-epileptic medications are employed. These drugs have many deleterious effects and are frequently expensive and in a certain patient population are ineffective. Good long-term control or disappearance of seizures occurs in 40-60% of the patients on phenytoin, phenobarbitol, carbamazepine and valproate. (7) For those patients that have intractable seizures, there is the possibility of surgery.

As chiropractors we occasionally hear of cases that were helped by chiropractic adjustments. Unfortunately, there is a paucity of case studies or journal articles addressing

this problem. I propose to put forth a possible mechanism of why chiropractic adjustments could be effective in treating this disease. Due to the frequency, cost, chronic nature and devastating effects on personal and social lives, epilepsy represents a significant problem to the patient suffering from it. If we, as chiropractors can effectively impact this problem, it would behoove us to do so.

Cases Studies

The first case study was of a five year old female with a history of birth trauma (she was breech and small for her age) with frequent infections and many attacks of otitis media. In October 1988, at the age of four years, she struck her head on a table. Within two hours her fast grand mal seizure occurred. A second seizure occurred within three weeks. The child was evaluated at the Mayo Clinic and was experiencing 10 - 30 seizures per day with no seizure free days. Seizure types were described as tonic, clonic, akinetic and grand mal. She was diagnosed with Lennox-Gestaut Syndrome.

All laboratory tests, (CBC, serum ammonia, and SMA 20) were within normal values. CT and MRI were also negative for any pathology or fracture. Her EEG study showed slow spike-wave abnormalities. He prognosis was not good as medical treatment of this disorder rarely has any beneficial results. She was given Depakote, Zarontine, and ACTH therapy singly and then stopped due to adverse reactions. Tegretol seemed to produce some benefit by decreasing the grand mal seizures but the patient then began to have drop attacks.

In July 1989, she was evaluated and treated at the Palmer College Chiropractic Clinic. The patient was experiencing 30 to 70 seizures per day. Her examination revealed decreased verbal skill. Physical examination showed wax buildup in the ears obscuring the tympanic membranes. The neurologic evaluation revealed hyper-reflexia and asymmetric reflexes. The orthopedic evaluation was unremarkable. The chiropractic examination revealed spasm of paravertebral muscles, severe restriction of cervical spine ranges of motion, particularly in right lateral bending, right leg deficiency and possible atlas subluxation. The patient was shifted anterior in weight bearing. Radiographic analysis also revealed misalignment of the occipito-atlanto-axial region anteriorly with some rotation present. The patient received adjustments to the upper cervical spine on three consecutive days with the adjustment taking place between 9:00 and 1:00 p.m. The seizure frequency was high the remained of the first day. After the second treatment, the patient had no more seizures during that day. On the third and final day, the patient had no more seizures after 1:00 on that day. The patient had exacerbation on the 17th day and on the 27th day the seizures abated and remained absent for nearly four weeks. The dosage of her medication remained constant throughout this period. Her dosage was decreased by half and at the time of the article, she had six or fewer seizures per day and absent completely on some days.

Post-treatment x-ray analysis showed a 91% decrease in misalignment and the anteriority was corrected and there was no leg length deficiency. The patient as speaking in

five or six word sentences and a speech evaluation was pending.

This study shows that in this case, the chiropractic treatment was beneficial to the patient when the full range of anti-epileptic drug therapy had little positive effect. (8)

Another case involved a 21-year old male with petit mal and grand mal seizures. He had a history of severe head trauma and loss of consciousness while playing football two years prior to the onset of the seizures. After evaluation by his medical doctor which included CT, MRI, blood chemical analysis, radiographic and EEG studies. At that time, no diagnosis was made. The patient was given Tegretol at 600mg per day and later increased to 800 mg when the previous dosage was shown to be ineffective in controlling the daily seizures. After another grand mal seizure, the physician made the diagnosis of epilepsy and increased the dosage to 1000 mg daily. The tegretol caused many side effects that interfered with the patient's normal daily activities and so he sought chiropractic care.

The chiropractic evaluation showed cranial faults, reversal of the normal cervical sagittal curve and possible subluxation of C1 and C2. The treatment consisted of correction of the cranial faults and chiropractic adjustment to the segments listed. He was treated 3 times per week for a period of four weeks. At the end of the first month, the patient reported only 2 micro-seizures and no grand mal attacks.

While this case is far from complete, it appears that chiropractic care played an essential part in the patient's decrease in seizure episodes. (9)

Etiologies and Diagnosis

The EEG is key in the diagnosis of epilepsy but it requires clinical correlation as described previously. It shows: (a) alteration of background activity and focal polymorphic activity which would suggest a lesion in subjacent structures and (b) paroxysmal events, localized spikes and spike slow-waves. (10) These EEG recordings should include readings during waking and sleeping states, hyperventilation, and photic states. (11) The EEG may also show diffuse spike waves with or without localized anomalies. The one factor that remains constant throughout is that no matter what type of seizure the patient experiences, it manifests the same way, as uninhibited firing of that area of brain. (11)

Dr. Rajna out of the Semmelweis University of Medicine puts the idea of a "two factorial" model (TFM) for the clinical manifestation of epileptic dysfunction. Briefly, he proposes that there is a parallel between seizure threshold and an innate physiological anti-epileptic defense system PAS). This would explain why family members have similar spike wave activity and yet one has seizures and the other does not. Also, it may explain why patients may have similar amplitude of spikes and yet very different severity of seizure activity. (12,13) The seizure type is therefore, merely a concomitant of which area of brain is firing.

This appears to reinforce the fact that due to the integrative individuality of our patients, we must examine them thoroughly.

The Neurophysiology of Chiropractic Treatment

We know that the largest input to the cortex is via joint mechanoreceptors in the upper cervical spine through the thalamus to the contra-lateral cortex. If the cortex is firing spontaneously there could be a variety of reasons such as (a) increased input from cerebellum; (b) chemical irritation; (c) tumor, all of which could cause a lack of inhibition on pyramidal cells from basket cells. (14)

In one study of patients with intractable seizures, an electrode was placed in the centro-median nuclei of the thalamus bilaterally. Stimulation of this area produced a significant decrease in seizure activity. This of course is highly invasive and is controversial at this point but it would follow that applying chiropractic treatment you would increase the inhibitory firing of basket cells, which act to inhibit the pyramidal cells of the cortex. By inhibiting pyramidal firing, we could ostensibly ameliorate or stop completely the incidence of seizure activity in a certain population.

Recommendations

The chiropractic profession needs to undertake a thorough investigation into the efficacy of chiropractic adjustments in the management of epileptic/ seizure patients. The few cases available would suggest that we could have a great impact on a specific patient population but research is needed to better define our role in treatment and to

predict which patients would best respond to chiropractic treatment. Careful investigation is needed of each case to afford each patient the most effective avenue in his or her case.

A complete analysis of each patient would include a thorough personal and family history, age of onset, precipitating factors, seizure frequency and duration, physical and neurological examinations, EEG studies pre- and post- seizure, and examination by a qualified chiropractor. After careful analysis we could then predict which patients would be candidates for chiropractic care.

CONCLUSION

Research shows that seizure activity occurs with hyperdepolarization of cortical neurons. In cases where there is increased firing due to a dis-integration of thalamocortical pathways, it can be hypothesized that specific chiropractic adjustments could increase the frequency of firing of the spino-thalamo-cortical pathways. This would stimulate the inhibitory function of basket cells on pyramidal cells thus decreasing or ceasing altogether seizure. Hence, routine chiropractic spinal examination and care become a logical method of management of the epileptic/seizure patient.

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