Use of Complementary and Alternative Medicine in Epilepsy

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Complementary and alternative medicine (CAM) has become much in vogue, and CAM practitioners have increased in tandem with this. The trend of using CAM for treating epilepsy does not differ from that in other medical conditions, with nearly one half of patients using CAM. In this article we review the major complementary and alternative medicines used for treatment of epilepsy. They include mind-body medicines such as reiki and yoga; biologic-based medicine such as herbal remedies, dietary supplements, and homeopathy; and manipulative-based medicine such as chiropractic. In the available literature, there is a sense of the merit of these therapies in epilepsy, but there is a paucity of research in these areas. Individualized therapies such as homeopathy and reiki cannot be compared with medicines in a conventional pharmaceutical model. Hence, many studies are inconclusive. In a science of double-blind, randomized controlled trials, appropriate designs and outcome measurements need to be tailored to CAM. This article explains the principles of the major CAM therapies in epilepsy, and discusses peer-reviewed literature where available. More effort needs to be put into future trials, with the assistance of qualified CAM professionals to ensure conformation to their therapeutic principles.

Introduction

The use of complementary and alternative medicine (CAM) has increased dramatically, generating public attention, including the formation of the National Center for Complementary and Alternative Medicine (NCCAM) at the National Institutes of Health in 1998 [1]. CAM therapies refer to a group of diverse health systems and products that are not presently considered to be part of conventional or allopathic medicine. In CAM, complementary therapies are used with allopathic medicine, and alternative therapies are used in place of allopathic medicine. CAM includes acupuncture, biofeedback, bodywork, chiropractic, dietary supplements, energy healing, herbal medicines, homeopathy, hypnosis, massage, meditation, pranotherapy, prayer/spiritual healing, reflexology, reiki, and yoga. A significant number of these therapies are currently used with or without allopathic medicine to treat neurologic conditions, including epilepsy [2]. Despite the fact that there is a growing body of literature addressing the rates of CAM use in the general population, less is known about the mechanism of action of these products and their benefits or risks in a clinical setting. We present here a literature review of the major complementary and alternative medicines used for treatment of epilepsy.

Background

CAM therapies have become much in vogue, and it behooves Western medical practitioners to inform themselves about CAM. Historically, healing in a broader sense has co-existed with medicinal healing, and in our modern world there is an increasing convergence among different systems of knowledge, as well as interest from some patients and clinicians in bridging these various approaches to health. A 1998 study found a 47% increase in total visits to CAM practitioners in the United States, from 427 million in 1990 to 629 million in 1997 [3]. According to a survey carried out in 2004 by the NCCAM, it was estimated that in the United States 36% of adults are currently using some form of CAM. Overall use is greater in women, in people with higher educational levels, and in people who have been hospitalized. The most common CAM therapies used include mind-body medicine (60%) such as reiki, spiritual healing, or prayer; biologic-based medicine (22%) such as herbal remedies, vitamins, and homeopathy; and manipulative-based medicine (11%) such as chiropractic and massage. In the survey, people were asked to select reasons among five options to describe why they use CAM: 55% of people believed that CAM improves health when used in combination with conventional medicine, and 28% felt that conventional medicine does not help [4]. The NCCAM has planed to collaborate with the National Health System to further analyze these survey findings.

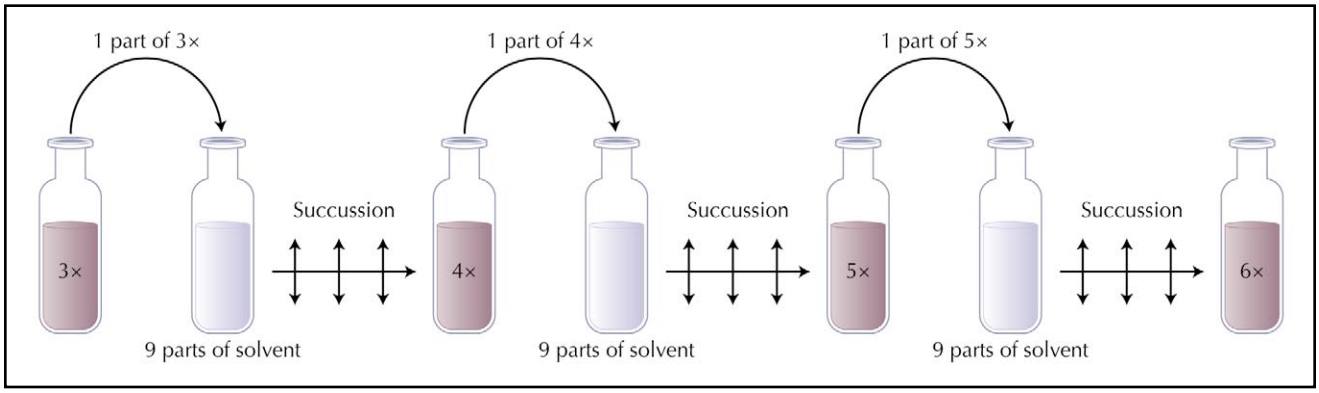

Figure 1. A schematic representation of the method of preparation of homeopathic remedies. Between each dilution, vigorous shaking (succussions) transfers the information of the solute into the solvent.

Epilepsy and CAM

The history of epilepsy in Western medicine can be traced to the fourth century BC, when Hippocrates reasoned that supernatural forces did not cause epilepsy. Before then, it was strongly believed that evil spirits possessed individuals affected with epilepsy; therefore they required spiritual healing. The Bible points to faith, prayer, and fasting for treatment (Mark 19:14–29). In Shamanism, which is an ancient set of practices involving meditation, a form of exorcism is still practiced to treat epilepsy [3]. Because of the immense advances in knowledge of the pathophysiology of epilepsy, perhaps the therapeutic "laying-of-hands" in the treatment of epilepsy has been lost during the centuries. There are several features of contemporary medicine's limitations that encourage patients to look to CAM as adjunctive treatment. These include psychosocial issues, pharmacotherapy side effects, and refractory epilepsy.

Epilepsy is a multidimensional condition because it includes many aspects of the person. Most patients feel that epilepsy impacts negatively on their social life, and in many circumstances stigma is still associated with epilepsy. Other patients feel discriminated against at work. Poor compliance with medication due to side effects (eg, weight gain, somnolence) is often a problem, especially when many patients require long-term and sometimes life-long therapy [5]. Moreover, 30% to 40% of patients with epilepsy suffer from refractory seizures [6]. There is not a general consensus on the definition of refractory seizure; however, according to the International League Against Epilepsy (ILAE) classification it can be defined as the persistence of seizures on three or more antiepileptic drugs in full dosage and total compliance over a period of 3 years. Drug resistance in epilepsy is likely to have a complex multi-factorial basis, including genetic contributions [7]. These factors contribute to the reasons why patients diagnosed with epilepsy seek help from CAM.

The trend of using CAM for treating epilepsy does not differ from that in other medical conditions. Sirven et al. [8], in a study of adult patients in Arizona, found that approximately 42% have used some form of CAM for non-seizure conditions, and 44% have used CAM specifically for their seizures. Another study showed that among children with epilepsy treated with anti-epileptic drugs, 32% had been treated at some time with CAM, whereas only 15% were currently being treated with CAM. This percentage is not significantly different from that of otherwise healthy children treated for acute illness [9]. A study carried out by Peebles et al. [10] in 2000 reports similar figures. Their research showed that 24% of patients with epilepsy used CAM therapies along with their conventional medicine, but only 31% of them informed their neurologists, underscoring the fact that health care professionals need to question patients more thoroughly about CAM because many patients do not volunteer this information [10]. Even these studies, which are limited by population selection, suggest that there are a considerable number of patients affected by epilepsy who choose to try CAM therapies. Such a tendency encourages us to look closer into the most popular CAM therapies and try to understand their potential value.

Homeopathy

Samuel Hahnemann (1755–1843) is the founder of homeopathy. Homeopathy is a form of therapy that is based on two major principles: the "dynamization" principle and the "similia" principle. The first principle is that remedies that come from natural elements are prepared by a process of serial dilutions and succussions (vigorous shaking) (Fig. 1). The more times this process is performed, the greater the potency of the remedy. In high-potency remedies (ultra-high dilutions of C12 and above), substances have been diluted and succussed beyond Avogadro's number, so they should not contain a single molecule of the original substance. It is believed that during this process bioenergy is transferred from the original substance to the solvent. The latter principle states that a minimal dose of a compound, which in a higher dose disturbed the biologic system, is used to

cure it (homologous). A minimal dose of a different compound, which at a higher dose causes the same biologic disturbance, is used to cure it (heterogeneous). As a clinical example, homeopathic dilutions of bee venom appear to be capable of inhibiting cutaneous erythema induced both by bee venom itself (homologous) as well as by ultraviolet rays (heterogeneous).

Despite several proposed mechanisms of action, there is no consensus agreement on how homeopathic remedies might work; however, it is strongly believed that the mode of action cannot be explained by a biochemical model. There is also very little evidence that clinical effects of homeopathy are not placebo effects. Recently, a comparative study of placebo-controlled trials of homeopathy and allopathy was carried out by Shang et al. [11]. Placebo-controlled trials of homeopathy were identified by a comprehensive literature search and matched to allopathic medicine trials for disease. Although at first sight both homeopathy and allopathy seemed effective, it was only when a meta-regression on a subgroup of trials was carried out that a greater propensity for a biased clinical effect was shown for homeopathy. According to the article, clinical effects of homeopathy are compatible with placebo effects. The Swiss Association of Homeopathic Physicians (SAHOP) [12] responded to the results of this study in a letter. Homoeopathists feel that the study did not assess homeopathy as currently practiced because trials were designed as disease specific, thereby ignoring the intrinsic homeopathic principle of basing therapy upon the totality of the individual's symptoms and signs. Moreover, the negative outcome of the study was strongly based upon a statistical extrapolation from a small number of large trials with negative results. Such trials are considered of very low quality from a homeopathic point of view. Finally, the homoeopathists argued that the study was incomplete and not transparent. Only 110 randomized homeopathic trials were included in the study despite the fact that there are hundreds available in the literature, and of those 110 trials the assignment of rank and weighting for the meta-analysis was not clearly described.

The main principles of homeopathy, *similia cum similibus curentur* (like cured by like) and potentization, illustrate that homeopathy aims to address the individual as a whole and not to simply treat symptoms. Therefore, treatment can often vary from subject to subject even if presenting with the same disorder. The Liga Medicorum Homeopathica Internationalis [13] advises that clinical trials, when organized with the aim of demonstrating a potential efficacy of homeopathy, should be done with the assistance of qualified professionals capable of conducting such work in conformity with homeopathic principles.

The most frequently used homeopathic remedies in epilepsy are silicea, cuprum, causticum, hyosciamus, *Aethusa cynapium*, *Agaricus muscaricus*, *Artemesia absinthium*, stramonium, and *Cicuta virosa*.

The way homeopathy remedies are used differs from conventional medicine. A patient is treated as a whole, and as such the treatment is not focused on the presenting complaint but on numerous personal, constitutional, physical, and mental characteristics of the patient. This explains why history taking in homeopathy can take up to 90 minutes. The individuals are described according to the characteristics that more closely resemble the remedy (*similia cum similibus*). Accordingly, one constitutional remedy is given with or without one or more remedies, which are more specific for the presenting complaint.

Silicea

Silicea is used in epilepsy that presents mainly in children and young adults. The silicea type of patient is usually distressed, especially at night or early in the morning, often has frightful dreams, and presents with spasm of limbs. The agitation, which increases with sleep deprivation, can lead to a generalized tonic-clonic seizure. The patient often describes the seizure spreading from the solar plexus (the abdomen) to the brain. Attacks could be preceded by coldness of left side, shaking, and twisting of left arm. Patients could suffer from vertigo and tinnitus, pressing bursting headaches over the eyes and the occiput, and profuse night sweats and fever [14].

Cuprum

Cuprum is used in individuals who present with clonic spasm after mental and physical overexertion and patients who present after sleep deprivation. As children, these patients often suffered from febrile convulsions, especially during teething. If the physical and mental strain becomes prolonged, it could lead to a generalized seizure. In between seizures or after a seizure, the patient can have signs of psychosis [14].

Causticum

Causticum is used in patients with seizures characterized by violent movements of the limbs, whose hands and feet are very cold while the rest of their body is warm and febrile, and whose seizures are often accompanied by screams, constriction of the facial muscles, and grinding teeth. These individuals are generally subject to spasms of the limbs, especially at night, and sensation of spasm of the throat [14].

Hyosciamus

Hyosciamus is a remedy used in patients who present with a background history of tics and convulsion movements/spasms that occur at the minimum excitatory stimulus. Seizure can often occur after meals, after a fright, after a dream, and after sexual intercourse. These patients can reach a paralytic state after seizing, associated with hallucinations and often with delusions [14].

Aethusa cynapium

Aethusa cynapium is used in epileptiform spasms with thumbs clenched, red face, cold limbs, eyes turned downwards, and pupils fixed and dilated. Patients suffer from food intolerances or allergies, most often to milk [14,15].

Agaricus muscaricus

Agaricus muscaricus is used in seizures that present from suppressed eruptions. The aura is characterized by a sensation of cold in the dorsal spine. Patients also presents with tremors and weakness of the lower limbs and lack of coordination. They could also suffer from rigidity of the back muscles, associated with twitching and pain [14,15].

Artemesia absinthium

Artemesia absinthium is used mainly for alcohol-related seizures. Seizures are preceded by trembling, especially of the tongue, and are characterized by involuntary twitching of the facial muscles [14,15].

Stramonium

Stramonium is used in patients who present with spasms of the neck muscles and occipitus. Their neck becomes stiff and bends backwards. They also suffer from spasms of the upper airway and muscles of the mouth. These individuals often stutter [16].

Cicuta virosa

Cicuta virosa has a wide range of use in epilepsy. The aura begins in the stomach or about the head and throat and extends downwards. The direction is downwards, instead of upwards as for cuprum. Seizures are often associated with redness of face, blue lips, bloody foamy mouth, trismus, prolonged loss of consciousness, distortion of the limbs, and violent spasm of the diaphragm, which causes post-ictal hiccups and swelling of the epigastrium [16].

Summary

As mentioned previously, the mode of use of homeopathic remedies is much more complex than it might appear from the brief descriptions given. Homeopathy requires appropriate scientific studies in conformity with homeopathic principles, perhaps with the assistance of homoeopathists. The scope of this review is beyond a discussion of dosing.

Herbal Remedies, Ayurveda, and Chinese Medicine

Herbal remedies

The practice of herbal medicine flourished during the medieval age in Europe when botanic gardens were created to grow plants with specific medicinal properties. In the seventeenth century, the trend shifted towards pharmaceutical products. However, in recent decades herbal medicine has had a popular renaissance and more studies have been performed. Anticonvulsant effects of herbal remedies have been examined in animal models, but some relevant data exist for human subjects too. The topic has been extensively reviewed by Tyagi and Delanty [17•], who discuss how some herbs may have anticonvulsant properties, some may lower the threshold for seizures, and some may interact with allopathic medications.

Ayurveda

Although not very commonly used in Western culture, Ayurveda is very important in the Indian subcontinent. According to an Indian survey, 32% of patients with epilepsy use CAM in India. Ayurvedic medicine is the most widely used, accounting for 43% of patients as monotherapy and 38% of patients using it in combination with other CAM therapies [15]. Ayurveda is an ancient Indian medical system that, when translated from Sanskrit, means "science (*veda*) of life (*ayu*)." Epilepsy was described in the second century BC by Characa, and later on by Sushrutha, a surgeon who practiced in the first century BC, and subsequently by Vagbata. According to Ayurveda, there are three fundamental systems in the body. The *doshas*, meaning the humors, govern physiologic and biochemical activities of the body and are divided into three parts: *vata* is responsible for motor and sensation of the body; *pitta* is responsible for metabolism; and *kapha* is responsible for coordination and compactness of the body. Health and disease in an individual generate from balance and disturbances of the *doshas*, respectively. Epilepsy was described as *apasmara* (*apa* meaning "loss of" and *smara* meaning "consciousness"), and it was known to occur when the patient would fall down, had jerky movements of the limbs, and twitching of the tongue and eyes. An aura was recognized and was called *apasmara poora roopa*. Characa gives a list of numerous forms of symptoms, including altered sensation, dream-like state, dripping of saliva, delusions, and vertigo. A feeling of void was added to this description of auras by Sushrutha. He also mentioned 18 causes of epilepsy, including transgression of dietary rules, eating contaminated food, wrong hygiene habits, extreme mental weakness, fear, anxiety, and agitation. Therefore, first-line management of epilepsy included diet restriction and education on hygiene. Furthermore, epilepsy was classified into four types, three of them being caused by disturbance in the three types of *doshas*, and the fourth type being a combination of disturbances. The *vata* type is characterized by very frequent, brief, and violent seizures where the patient is unconscious. The *pitta* type describes very agitated patients who present with an aura of feeling extreme heat, often accompanied by extreme thirst, yellow froth from the mouth, and striking on the ground, with the seizures being more prolonged than in the *vata* type. In the *kapha* type of epilepsy, seizures are very prolonged, with the interval between seizures being

very long, and convulsions are preceded by an aura where the patient feels cold and heavy. The fourth type is the most severe and incurable because it is caused by a combination of disturbances of the three humors. According to the diagnosis of epilepsy, suitable drugs are given. Preparation of these therapeutics includes fermenting the substances, extracting them, filtrating them, purifying them, and heating them. The most commonly used ingredients include gandhaga (sulfur), ghee (aged clarified butter), and herbs such as *Achyranthes aspena*, *Holanthena antidysenterica*, and *Ficus carica*. Mixed herbal preparations include Pancamula and Triphala [18]. No scientific evidence exists that these products have anticonvulsant properties, and to date no scientific research has been carried out on these products. In current practice in India, Mentat is still used in conjunction with allopathic anticonvulsant therapy and it has been reported to be of value in alcohol-withdrawal seizures [17•].

Chinese medicine

According to a Chinese survey, over 16% of patients in a general hospital in Taiwan use antiepileptic drugs in combination with traditional Chinese medicine [19]. The history of Chinese medicine is not well known, although we know that epilepsy was first mentioned in *The Yellow Emperor's Classic of Internal Medicine*, a collective work of Chinese physicians from 700 to 200 BC. Status epilepticus was first described in the 1770 AD. According to Chinese medicine T'ai Chi is the progenitor of the universe, and it is divided into two opposite forces: *Yang* (energy from the sun) and *Yin* (energy from the earth). Human activity and health is the reflection of the balance between these forces. It is believed that when the balance between *Yin* and *Yang* is altered, disease occurs. Moreover, according to Chinese medicine the human body is made of a mixture of five primordial elements: metal, wood, water, fire, and earth. As long as the proportions remain unaltered, health persists. Epilepsy was classified according to these beliefs and eight rules were proposed in treating epilepsy [20]. The therapy also includes the use of acupuncture and herbs. Studies reported that *Uncaria rhynchophylla* possesses anticonvulsant properties [19]. Qingyangseng root was suggested to be helpful in conjunction with anticonvulsant therapies [17•]. Other commonly used agents, such as scorpion, antelope's horn, and goat's intestine, that are often used in Chinese medicine have not been scientifically tested.

Aromatherapy

Aromatherapy is a treatment that uses essential oils from aromatic plants, trees, and grasses. Oils are inhaled, vaporized, used in baths and saunas, and for massage. The use of perfumes can be traced as far back as 4500 BC when the Egyptians used special fragrances to cover statues of deity and to embalm their bodies in oils, believing that they would last forever. Hippocrates himself believed that the way to maintain health was to have an aromatic bath and scented massage every day. Modern aromatherapy stems from the work of René-Maurice Gattefossé at the beginning of the nineteenth century. Later, a better understanding of the olfactory system stimulated research and experimentation with aromatherapy. Fragrances play an important role in the limbic system to enhance the body and the mind [21]. It is possible that such mechanisms as conditioning through heterosynaptic plasticity play a role in inhibition of seizure development through limbic/olfactory inputs [22]. In 1957, Efron [23] showed that jasmine aroma could be used as a countermeasure to prevent an oncoming seizure, and eventually triggering the memory of the fragrances was enough to stop the seizure.

An interesting 2-year follow-up study using aromatherapy in 100 patients with refractory epilepsy was conducted in Birmingham, England in 2003. Some of the patients had a series of aromatherapy massages only, some had aromatherapy massage and hypnosis, and the others had hypnosis only. These patients were followed-up for 2 years after treatment ended. The oils chosen were jasmine, ylang-ylang, lavender, chamomile, bergamot, and marjoram. Oils containing camphor were avoided because of concern that they may precipitate convulsions. Of the three treatments, aromatherapy plus hypnosis had the best and most lasting effect, as one third of patients were still seizure free after 2 years. Although this study was not done in a blinded fashion, the authors suggest that aromatherapy is a useful adjunct for treatment of refractory seizures [24].

Reiki

Reiki is a relatively recent form of healing practice that involves transfer of life force from the healer to the patients by positioning the hands on specific parts of the body, particularly on "energetic channels" called chakras (Fig. 2). The founder of traditional reiki was Dr. Mikao Usui. In 1914 he decided to leave his practice to spend time meditating on Mt. Kurama by a Buddhist temple. During such an experience he established reiki as a form of healing. Soon after, the first reiki clinics opened in Japan. The reiki treatments are hypothesized to act via quantal energy. In epilepsy the fifth chakra, otherwise known as the third eye, is considered the major energetic center triggering seizures.

Only one published study on epilepsy and reiki exists. In a randomly selected sample population with refractory epilepsy from a single neurology department, data were collected (including serum magnesium levels) on 15 patients before treatment and 3 months after treatment. The patients were aged between 20 and 30 years and had no co-morbidities. Seizure frequency at the end of treatment was reduced and there was also a significant increase in serum magnesium. Although the study was conducted poorly, with these results they postulated that reiki has its foundations in quantum mechanic theory. Unfortunately,

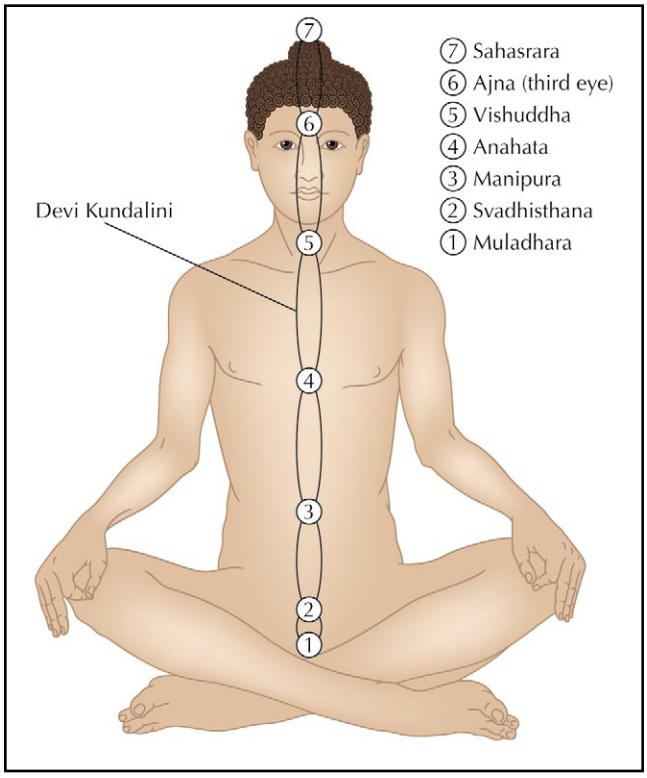

Figure 2. A diagram of the seven chakras and the kundalini energy flow. Seizure disorders are visibly seen by reiki healers as disturbances of the sixth chakra (the third eye) and its related aura. The aim of therapy is also to rebalance the kundalini energy flow between chakras, which can also be achieved through kundalini yoga.

the authors do not detail how random selection in such a single-arm study was done, but the results deserve further and more scientifically based study [25].

Yoga

Yoga is an old Indian psychophysical method of relaxation and enhancement of health. It is a method of controlling the mind through the individual energy, known as *Prana*, with the universal energy known as *Brahman*. Several different yoga techniques are practiced. Yoga involves meditation, controlled deep breathing, muscle stretching, and specific body postures and routines. It is well recognized that yoga has an effect on body physiology, as several studies had been carried out on Yogis in India by physicians. Various studies specifically looked at electroencephalogram (EEG) changes in individuals practicing yoga. Meditation has been shown to produce relaxation. In a study by Yardi [26•] 32 patients with epilepsy were divided into three groups: one group practiced Sahaj yoga for 6 months, one group practiced exercises mimicking yoga for 6 months, and one group served as the control group. In the first group, a 62% reduction in seizure frequency was reported at 3 months, and a further decrease of 86% at 6 months. Power spectral analysis of interictal EEG also showed a shift in frequency from 0 to 8 Hz towards 8 to 20 Hz. No significant changes were noted in the other two groups [26•]. The possible mechanism underlying the beneficial effect of yoga and meditation is not known. There are several theories that propose a limbic modulation via hypothalamus, which results in regulation of endocrine release. However, further studies are necessary.

Chiropractic

There are many reports supporting chiropractic as a non-pharmaceutical health care approach for epilepsy, especially in pediatric patients, but they are all anecdotal in nature. An interesting case report describes a 21-year-old woman suffering from tonic-clonic seizures who underwent chiropractic treatment and who had reduced seizure activity after the first visit [27]. In another report, a number of children with epilepsy treated with chiropractic showed changes in the frequency of seizures and changes in the EEG patterns. There are several proposed modes of action on how chiropractic could affect epilepsy. One theory proposes that chiropractic adjustments promote the release of neurotransmitters. Another theory states that these adjustments activate receptors in the spine, resulting in alteration in neuronal afferent input to the brain [27]. However, all the theories have failed to give scientific evidence and explanations.

Diet

There is an increasing interest in the role of diet in epilepsy. Grapefruit and pyrrolizidine, which are found in some herbal teas, are known to interact with anticonvulsants, and dietary supplements such as ephedrine and aspartame are associated with seizures [17•].

In 1998, a multicenter study of the ketogenic diet was done in the United States. The ketogenic diet was developed in 1920 and it consists of a high-fat, low-protein, low-carbohydrate diet used for the treatment of seizures. Fifty-one children aged 1 to 8 years with more than 10 seizures a week who were refractory to medications were treated with the ketogenic diet. The patients were admitted to the hospital, and family and staff were educated on how to carry out the diet. After 3 months of the study, six children were free of seizures and the remainder had a reduction of seizures ranging from 50% to 90%. One year later, 24 of the 51 children remained on the diet and they had 50% to 90% reduction in seizures [28]. However, the ketogenic diet has some important drawbacks: it restricts calories, fluids, and proteins, resulting in side effects such as kidney stones, constipation, acidosis, diminished growth, iron deficiency anemia, and weight loss [29]. Recently, a study of a modified Atkins diet was done in the United States. The advantage of this diet is that there is no restriction on calories or need for fasting. Twenty children, aged between 3 and 18 years, were enrolled. They had tried at least two anticonvulsants and had at least three seizures per week. They were followed up at 3 and 6 months of

treatment. Sixteen of the 20 patients completed the 6-month study: 19% were seizure free, 19% had greater than 90% seizure reduction, and 37% had greater than 50% improvement. Side effects in this cohort of patients were limited and weight loss was minimal [30].

Another variation of possible dietary therapy for epilepsy is the low-glycemic index diet. This is a diet that allows a more liberal intake of carbohydrates but is restricted to foods that produce relatively little increase in blood glucose (ie, a low- glycemic index). In a retrospective chart review, 20 patients with refractory epilepsy who were initiated on the low-glycemic index treatment were analyzed. Of this group of patients, 50% experienced a 90% reduction in seizure frequency. According to the authors, a low-glycemic index treatment is considered easier to follow than the classic ketogenic diet and causes fewer side effects [31]. These studies show that diet should be explored further as a source of seizure control.

Conclusions

The use of CAM is common among patients with epilepsy and should be asked about during history taking. There are many reasons why so many people use CAM, and certainly CAM appears to offer something of value to many. However, there is a lack of good quality research in CAM in epilepsy, and this shortfall needs to be addressed by the epilepsy community and by CAM practitioners. Although some modes of CAM may be amenable to study using the controlled clinical trial model of conventional allopathic medicine, other study paradigms may need to be devised in conjunction with CAM practitioners. CAM should be embraced as having a potential important role in the integrated holistic management of patients with epilepsy.

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