Complementary and alternative medicine (CAM) for epilepsy treatment in the Middle East and North Africa (MENA) region

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ABSTRACT

Introduction: The aim of this study is to provide the reader with a review on Complementary and Alternative Medicine (CAM) treatment in epilepsy in the Middle East and North Africa (MENA) region, to describe the extent and factors associated with its use among patients with epilepsy (PWE), and to recommend how effectively we will be able to reduce this alarming use.

Material and Methods: Retrospective literature search from 1945 to December 2019, regarding CAM use in the MENA region, using electronic databases (PubMed, Scopus, Google Scholar, Web of Science).

Conclusion: The use of CAM and consultation of traditional healers for the treatment of epilepsy has so far been widespread practice for centuries in the MENA region. Lack of health professionals and non-adherence to conventional epilepsy treatment are strongly associated with the use of CAM. Improvement in the level of knowledge of epilepsy among PWE, healthcare professionals, including traditional healers, will educate PWE and their caregivers on potentially unsafe practices and promote adherence to Antiseizure Drugs (ASDs). Additionally, randomized controlled trials are needed to study the role and value of various CAM treatment options in PWEs.

1. Introduction

The history of epilepsy and its management dates back to at least four millennia, to the ancient civilizations of the Middle East (Asadi-Pooya et al., 2012a). Herbs are mentioned in ancient Egyptian medical papyri. (Atanasov et al., 2015; Issa et al., 2014) Ebers Papyrus is among the oldest and dates from about 1550 BC (Issa et al., 2014). Past epilepsy treatments were typically empirical, reflecting clinical observations of ancient physicians or even superstitions. These treatments included diets, medicinal herbs, and occasionally surgery such as skull trephination, among other strategies (Asadi-Pooya et al., 2012a; Gross, 1992). Drug therapy is currently the mainstay of epilepsy treatment. Many new antiseizure drugs (ASDs) have been introduced to the market in the last few decades, so there are now around 30 ASDs available for the treatment of epilepsy (Kwan and Brodie, 2000). However, about one-third of patients with epilepsy have drug-resistant seizures despite using the appropriate ASDs (Kwan and Brodie, 2000). Drug-resistant epileptic seizures are associated with increased risks of morbidity and mortality (Asadi-Pooya et al., 2012b; Sperling et al., 2016); as a result, many people with epilepsy (PWE) are often desperate to seek help wherever they can find it, even if it is a nonconventional option. Complementary and alternative medicine (CAM) is defined as “those healthcare and medical practices not currently an integral part of conventional medicine” (Eisenberg et al., 1998). These may include traditional medicine, herb drugs, special (e.g. religious) ceremonies, and meditation, among others. The use of CAM is prevalent worldwide. More than 40% of the populations in Western countries use CAM for various health conditions (Sirven, 2007). The current research aims to provide a
narrative review of the use of CAM for epilepsy treatment in the Middle East and North Africa (MENA) region.

2. Methods

The following electronic databases were searched: PubMed, Scopus, Google Scholar, Web of Science, from 1945 to December 2019, for articles including the following keywords in their title: CAM, Complementary medicine, alternative medicine, traditional practice, traditional treatment, traditional medicine, epilepsy, convulsions, MENA, Middle East and North Africa. The same databases were also investigated using the same keywords, and each time the name of one country of the MENA region was added successively: Algeria, Egypt, Iran, Iraq, Kingdom of Bahrain, Kingdom of Jordan, Kingdom of Saudi Arabia (KSA), Kuwait, Lebanon, Mauritania, Morocco, Palestinian Territory, Qatar, Sudan, Sultanate of Oman, Syria, Tunisia, United Arab Emirates (UAE), Yemen. Relevant articles from MENA countries were identified; relevant articles and reviews from other countries were also considered and evaluated if necessary. In addition, articles written in French reporting the use of CAM in North Africa were included.

2.1. Role of the research team

All authors were involved in the initial sets of literature search. Researchers who specialized in different countries of the MENA region were in charge of writing sections of the articles from countries of interest as follows: 4 authors, B Mesraoua, D Deleu, A Musab and G Melikyan for the Middle East, L Elsheikh and H Alhail for Sudan and Egypt, A Asadi-Pooya for Iran and N Kissani for North Africa. The following authors: B Mesraoua, D Deleu, A Asadi-Pooya, and S Wiebe interpreted, analyzed the data, and drafted the manuscript; finally all authors critically revised the manuscript.

3. Complementary and alternative medicine for epilepsy in Iran

History of epilepsy and its treatments in Iran dates back to ancient times. Avicenna, who was a Persian-speaking Iranian, Muslim polymath and the foremost physician and Islamic philosopher of his time (1000 years ago) has many recommendations for the treatment of PWE in his book, “The Canon of Medicine” (Asadi-Pooya et al., 2012a). These include herbs [e.g. 6 Rue, (Ruta), Chives (Allium schoenoprasum), Summer savory (Satureja hortensis), Sheeba (Artemisia absinthes), Dill (Anethum graveolens), and Hyssop (Hyssopus)], and also avoidance of precipitating factors for seizures, such as alcohol, overfeeding, and sleep deprivation (Asadi-Pooya et al., 2012a). Herbal remedies have been used to treat seizures for centuries in this country (Sahranavard et al., 2014). In two previous studies we observed that CAM is a therapeutic option considered by many PWE and also by many physicians involved in the care of PWE in Iran, even at the present time (Asadi-Pooya et al., 2019; Asadi-Pooya and Emami, 2014). In one study, 70 % of the patients believed that CAM would be helpful in treating epileptic seizures. The most commonly reported CAM therapies for epilepsy were as follows: prayers (46 %), exercise (28 %), and herbs (23 %) (Asadi-Pooya et al., 2019). In the same study, 16 % of the patients had actually used CAM for the treatment of their epileptic seizures; however, only one patient perceived that CAM was more effective than ASDs in controlling her seizures (Asadi-Pooya et al., 2019). The patients who used CAM expressed that dissatisfaction with the cost of conventional ASDs (88 %), dissatisfaction with the effectiveness of conventional ASDs (63 %), and dissatisfaction with the adverse effects of conventional ASDs (57 %) were their motives for using CAM (Asadi-Pooya et al., 2019). No randomized controlled trials have ever investigated the efficacy of various CAM treatment options for epileptic seizures (Sirven, 2007; Asadi-Pooya et al., 2019; Asadi-Pooya and Emami, 2014; Giovagnoli et al., 2019; Rajesh et al., 2006; Samuels et al., 2008). The high rate of perception of the effectiveness of CAM in treating epileptic seizures in Iranian society is probably attributable to cultural misbelieves (Asadi-Pooya and Emami, 2014); when a minority of them used CAM to treat their epileptic seizures, most did not notice any benefit (Asadi-Pooya and Emami, 2014). Health care professionals involved in the care of PWE may also play a significant role in creating or alternatively correcting misbeliefs on epilepsy treatment strategies (Asadi-Pooya et al., 2019). In one study from Iran (Asadi-Pooya et al., 2019), 55 % of the neurologists believed that CAM would be helpful in treating epileptic seizures. The most commonly reported CAM therapies for epilepsy were as follows: meditation (39 %), yoga (35 %), and exercise (29 %) (Asadi-Pooya et al., 2019). Nineteen percent of these neurologists had actually recommended CAM to treat PWE; however, only one physician perceived that CAM was more effective than ASDs; he used traditional diet recommendations (Asadi-Pooya et al., 2019).

4. Complementary and alternative medicine in the Middle East

In the Middle East, as in other regions of the world, the use of CAM seems to be a common practice in PWE (Fenkin, 1945). There are communities that perceive epilepsy as being caused by supernatural forces, and therefore, PWE provides fertile ground for traditional healers or the use of CAM (Schachter, 2008). In addition, the side effects resulting from ASDs contribute to poor adherence to conventional treatment (Sweileh et al., 2011), thereby opening the way to the use of CAM (Ferrari et al., 2013). Studies have shown that most PWE tend to use both CAM and ASDs (Rhodes et al., 2008; Cheuk and Wong, 2008; Ramaratnam et al., 2008; Ranganathan and Ramaratnam, 2005). Historically, the Middle East region is distinguished from other regions by a rich inventory of CAM, medicinal plants in particular (Schachter, 2008). Archaeological evidence indicates that the use of medicinal plants dates back to the Paleolithic age, approximately 60,000 years ago. Written evidence of herbal remedies dates back over 5000 years to the Sumerians who compiled lists of plants (Anon, 2020). Traditional Arab and Islamic medicine (TAIM) holds a prominent place in this area, (Allrawi et al., 2017). TAIM is often based on the use of plants. For many, TAIM is the first choice in the treatment of various diseases such as infertility, epilepsy, psychosomatic disorders, and depression. Research on TAIM herbs has been carried out in many countries in the Middle East such as Syria, Yemen, Egypt, Iran, and others. More than 250 species from different families have been described in recent surveys of plant species from this area, many of which are still in use (Schachter, 2008; Said et al., 2002; Zyoud et al., 2015). There is a dearth of studies reporting the use of CAM in epilepsy in the Middle East. In a cross-sectional study (Al Asmi et al., 2013), the researchers explored the types and sociodemographic correlation of CAM use among PWE in the Sultanate of Oman. From the 101 patients studied, 73 % were CAM users. Frequently used CAM types were: ‘mind–body’ type (incantations and fumigation) and biologically based (herbal concoctions) methods, or a combination of both. A significant proportion of CAM users thought nonbiomedical factors to be the cause of their disease, such as ‘evil eyes’ when compared to non-CAM users (P = 0.04). CAM use was highly associated with age of >30 years, low family income, having basic school education, and unemployment (Al Asmi et al., 2013). Another group of researchers studied CAM use among children attending a pediatric neurology clinic in North Jordan (Aburahma et al., 2010). Among the 176 patients studied, 99 parents (56 %) used CAM for their children neurological illness, including epilepsy. Frequently used CAM options were prayer/reciting Quran (77 %), religious healers (30 %), olive oil massage (52 %), and honey (29 %) (Aburahma et al., 2010). Religious beliefs (68 %), fathers older than 30 years, and mothers with basic school education were the factors associated with CAM use. None reported a lack of confidence in modern medicine as the reason behind CAM use (Aburahma et al., 2010). In a cross-sectional study involving
parents attending pediatric neurology clinic at King Faisal hospital in the KSA (Zainy et al., 2013), a questionnaire was used to examine the demographics, knowledge and attitude of 117 parents; 44 % thought that epilepsy had correlation with evil and 29 % used traditional or religious practices (Zainy et al., 2013). Finally, in a study of mothers visiting an outpatient clinic in Western KSA (Jan et al., 2009), the authors interviewed 79 Saudi mothers regarding the contributing factors for CAM use in their children with chronic conditions including epilepsy; 33 families (42 %) used CAM for their children, in 57 % even before asking for medical help. 82 % relied on Spiritual (religious) healing and oral preparations or herbs was used in 30 %. Basic school education of fathers and positive family history of using CAM were strongly associated factors with the use of CAM (Jan et al., 2009).

5. Complementary and alternative medicine in Sudan and Egypt

Sudanese health culture has its roots in earlier civilizations of the Nile Valley (EI, 2007). Other foreign influences from neighboring African, North African and Middle East cultures have also reshaped the original society. Supernatural powers as a cause of epilepsy is still a general belief in Sudan (EI, 2007). Consultation with traditional healers for epilepsy treatment has been a general practice for centuries in this country (WHO, 2020). Traditional medicine has recently been confronted with the rivalry of modern medicine; however traditional medicine with its powerful establishement, remains a reality in Sudan because it is sustained by a continuing popular demand. In a recent cross sectional hospital-based study, carried out in Sudan, the authors looked at the impact of spiritual beliefs that may explain epilepsy etiology and the choices and methods of CAM used in the treatment of children with epilepsy (CWE). A total of 180 caregivers were interviewed using a questionnaire. Fifty-eight (32.2 %) caregivers believed epilepsy is due to supernatural causes. A large majority of them (705 %) used CAM [e.g., incantations (45.6 %), spitting cure (37.2 %), ritual incensing (36.7 %)] to treat epilepsy (Mohammed and Babikir, 2013). As frequently reported in many countries in the MENA region, the use of CAM commenced to treat epilepsy (Mohammed and Babikir, 2013). In another study from Khartoum city, 2015) (El-Nimr et al., 2015; El-Tallawy et al., 2016; Meinardi et al., 2001; Taher et al., 2018). Peganum harmala L. and Ruta graveolens L. are the best examples of known plants for the treatment of epilepsy (Nunn, 2002). Bedouins in the Sinai desert, used many herbs for the treatment of seizures such as Anastatica hierochuntica L. (Kaff Mariam) (Essa et al., 2014). One study from Egypt revealed that 77.7 % of adults use CAM in the treatment of chronic diseases, including epilepsy (El-Nimr et al., 2015). In this country, the alarming epilepsy treatment gap is related to the cost of treatment, cultural beliefs, and unavailability of ASDs and may explain the widespread use of CAM in treating epilepsy in Egypt (El-Nimr et al., 2015; El-Tallawy et al., 2016; Meinardi et al., 2001; Mbuba et al., 2008; Junaid Farrukh et al., 2018).

6. Complementary and alternative medicine for epilepsy in North Africa (Morocco, Algeria, Tunisia, Libya and Mauritania)

In Mauritania, Classical Arab and Islamic Medicine dates back to the 7th century CE; it has its roots in the Greek hippocratnic tradition with major contributions from Avicenna, and is used by a large part of the population (Graz, 2010; Oumeish, 1998). In Mauritania, there is a good collaboration between CAM practitioners and modern medical practitioners (Graz, 2010; Graz et al., 2003). In Algeria, medicinal plants have been used for centuries to treat various diseases, including epilepsy (Benarba et al., 2015; Ramdane et al., 2015; Vasisht and Kumar, 2004). In the south, the Sahara, local populations have continued to rely on traditional healers for their healthcare for centuries (Vasisht and Kumar, 2004). Medicinal plants have always played an important health and economic role in traditional medicine in Morocco (Rankou et al., 2013; Benabid, 2000; Montanari, 2014). Traditional medicine has also a special place in Tunisia and Libya (Agricultural Investment Promotion Agency, 2003; El-Mokasabi, 2014). Very few studies have assessed the exact prevalence of CAM use in PWE across North Africa despite the fact that the use of CAM is widespread among the general public (Hyodo et al., 2005). Two Moroccan studies highlighted the popularity of traditional practices in PWE in this country. These surveys showed that 60 and 74 % of PWE were treated by traditional healers long before consulting a medical doctor. According to the authors, illiteracy, financial limitations, lack of neurologists and their poor distribution in the country, are the reasons behind using CAM in PWE (Mebrouk, 2012; Louhab et al., 2005). In one research from Mauritania, in 150 PWE (Traore et al., 1998), 77 % of patients were treated by traditional remedies (CAM). In this country a large part of the population, the Moroish population believes that epilepsy is due to excessive food intake called "iguindi"(Traore et al., 1998); hence ingestion of food considered an antidote to iguindi is the correct CAM treatment for epilepsy. In a community-based cross-sectional study conducted in Libya, many people believed that PWE are possessed by evil spirits (704%); furthermore, epilepsy was considered to be a treatable disease using CAM (441%) (Taher et al., 2018).

7. Discussion

This paper regarding CAM treatment in epilepsy in the MENA region contains diagnostic, therapeutic and cultural elements unknown to many health care professionals from the region and the western world Table 1. Although some of the CAM practices reported in the current study may never be applied in a world of federal drug approval, however, it will help us understand the rational and hazard of using CAM. Unless some of the CAM remedies targeting particularly herbal medicine and plants and other CAM practices have been subjected to rigorous clinical trials, official acceptance of CAM in epilepsy by the neurological epilep- city community is still a remote possibility. The major issues encountered in this endeavor are financial, technical and methodological limitations especially in the poorest countries of the MENA region.

In this region, CAM has evolved from cultural and religious beliefs in a population with increased religiosity and spirituality to generally become low cost treatment, as compared to the high cost of modern epilepsy management in the western world. Although many of the CAM therapeutic applications go back centuries, often earlier, patients continue to embrace these practices and remedies which are still part of the therapeutic armamentarium not only in the MENA but also in many parts of the world. As our study points out, the popularity of these treatments and practices among PWE and their caregivers in the MENA region is enormous. However, the enthusiasm for the excessive use of CAM in epilepsy is not scientifically consistently supported, as reported by a recent study from the same region, Iran, which shows that very few neurologists consider CAM to be superior to ASDs (Asadi-Pooya et al., 2019).

An important point worth discussing is the availability of ASDs in the MENA region. There are certainly important access issues to these pharmacological drugs, especially the newer ASDs, in many countries of the MENA. For example, the following newer ASDs: Felbamate, Tiaga- bine, Zonisamide, Briveracetam, Rufinamide and Stiripentol are not available; on the other hand, Lacosamide, Eslicarbazepine, Perampanel are only available in very few countries of the MENA region, particularly in the richest countries (Gulf countries). Furthermore, in a recent study from the Sultanate of Oman reporting the use of ASDs in this country, the most frequently prescribed drug in monotherapy was Sodium Valproate
Table 1
CAM use in epilepsy: Comparison of studies results from MENA region.

| MENA Country /Region | History of CAM use | Causes of epilepsy nonbiomedical factors for CAM users vs non users (P < 0.004) | CAM use before medical consultation (27 %) | CAM users (77 %) | Patients/caregiver/physician opinions about CAM use | CAM users (70 %) | Disatisfaction with cost of ASDs (88 %) effectiveness of ASDs (63%), adverse effects of ASDs (57 %) | CAM users (73 %) | Poor adherence to ASDs due to side effects (Samuels et al. 2008) |
|----------------------|---------------------|-----------------------------|-----------------------------------------------|-----------------|---------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------|
| Middle East | Paleolithic, 60,000 yrs ago (Cheuk and Wong, 2000) | Prayer (77 %), Religious beliefs (68 %); fathers older than 30 yrs; mothers with basic school education (AlRawi et al., 2017) | CAM users (70 %) (Eisenberg et al., 1998) | CAM users (73 %) (Anon., 2020) | Patient’s age of >30 yrs, low family income, having basic school education, and unemployment (Anon., 2020) | CAM users (56 %) (Ait Rawi et al., 2017) | ‘mind–body’ (Incantations, fumigations, herbal concoctions or both (Anon., 2020) | CAM users (70 %) (Eisenberg et al., 1998) | Cost, unavailability of ASDs, and cultural beliefs (Mohammed and Babikir, 2012; Younis, 1983; El-Simir et al., 2015; El Tallawy et al., 2016; Meinaudi et al., 2001) |
| Sudan | 4000–3000 BC (Medicinal plants Ancient Egypt) (Zainy et al., 2013) | Prayer (27 %), Spiritening cure (37.2 %) | CAM use (60 %) (Al Zaif et al., 2012) | CAM users (70 %) (Hyodo et al., 2005) | Illiteracy, financial limitations, lack of neurologists poor distribution in the country (Hyodo et al., 2005) | CAM users (77 %) (Hyodo et al., 2005) | Traditional healers (Agricultural Investment Promotion Agency, 2003; El-Mokasabi, 2014) | CAM users (77 %) (Hyodo et al., 2005) | Epilepsy due to excessive food intake “iguindi”; ingestion of iguindi antidote – correct CAM treatment for epilepsy (Traore et al., 1998) |
| North Africa | 7th century AC (TAIM) (Junaid Farihah et al., 2016) | CAM use (27 %) (Hyodo et al., 2005) | CAM use before medical consultation (27 %) | CAM users (77 %) (Hyodo et al., 2005) | Traditional healers (Agricultural Investment Promotion Agency, 2003; El-Mokasabi, 2014) | CAM users (70 %) (Eisenberg et al., 1998) | Prayer (46 %), Exercise (28 %), Herbs (23 %) (Eisenberg et al., 1998) | CAM users (73 %) (Anon., 2020) | Poor adherence to ASDs due to side effects (Samuels et al., 2008) |
| Iran | Ancient times, 4000 yrs ago (Asadi-Pooya et al., 2012a) | CAM helpful in treating seizures (55 %) of neurologists (Eisenberg et al., 1998) | CAM users (70 %) (Eisenberg et al., 1998) | CAM users (70 %) (Eisenberg et al., 1998) | Poor adherence to ASDs due to side effects (Samuels et al., 2008) | CAM users (56 %) (Ait Rawi et al., 2017) | ‘mind–body’ (Incantations, fumigations, herbal concoctions or both (Anon., 2020) | CAM users (70 %) (Eisenberg et al., 1998) | Cost, unavailability of ASDs, and cultural beliefs (Mohammed and Babikir, 2012; Younis, 1983; El-Simir et al., 2015; El Tallawy et al., 2016; Meinaudi et al., 2001) |

CAM : complementary, Alternative Medicine ; ASDs : antiseizure drugs ; TAIM : Traditional Arabic and Islamic Medicine.

(27 %) followed by Carbamazepine (23 %) and in combination Sodium Valproate with clonazepam (12 %) and Sodium Valproate with Lamotrigine (12 %) (Al Za’abi et al., 2013). The same prescribing pattern of ASDs was recently reported from Jordan where two old ASDs are most frequently prescribed as monotherapy, Valproic acid (50.5 %) and Carbamazepine (33.3 %) and in combination Valproic acid with Carbamazepine (17.3 %), Carbamazepine with Levetiracetam (13.0 %) and Valproic acid with Levetiracetam (12.3 %) (Albsoul-Younes et al., 2016). Another recent study from Iran reported the same pattern of prescribing ASDs, in several countries of the MENA region: Sodium valproate, followed by Carbamazepine followed by Phenobarbital in monotherapy (Rezaeian Yazdi et al., 2015). Such a pattern of prescribing ASDs in several countries of the MENA, as described above, offers very limited options for almost exclusively older ASDs with more side effects thus representing one of the factors associated with the use of CAM in this region (Asadi-Pooya et al., 2019; Sweileh et al., 2011).

The use of CAM in epilepsy is still the standard in many countries of the MENA region and beyond. CAM remedies and practices to manage a variety of illnesses including epilepsy has also become increasingly common in Western societies (Eissa et al., 2014; Gross, 1992; Frass et al., 2012; Harris et al., 2020). A recent study involving 21 European countries and analyzing the availability of CAM use in these countries found that health expenditure was linked to the prevalence of CAM treatments in these countries (Fijer et al., 2020).

These CAM practices will remain for many decades, if not centuries. In addition, in several regions, medical institutions have incorporated CAM in their curriculum, and the practice has been established to educate and teach about CAM. Our study clearly explains the reasons that have led to the current situation.

This study has some limitations, including the lack of high-quality data from randomized clinical trials on the use of CAMs in this region.

8. Conclusion

Many countries in the MENA region, the poorest in particular, suffer from lack of health care professionals and their poor distribution in the region. Non-adherence to conventional treatment for epilepsy in this region is strongly associated with the use of CAM, as is the increase in religiosity and spirituality among this population. Providing evidence-based and appropriate information to PWE and also to healthcare professionals about the dangers of not taking ASDs and alternatively seeking help from an unconventional treatment option is very important. Increasing access to more ASDs options in this region would be beneficial and may also support less CAM use. While some CAM treatment options (e.g., spirituality meditation, music, exercises may be helpful for PWE (e.g., to improve their quality of life) (Giogagnoli et al., 2019; Rajesh et al., 2006; Afra et al., 2018; Shawahna and Abdelhaq, 2020), others (e.g., exorcism or some herbal medicines) are a clear risk to patients (Al Asmi et al., 2013; Mohammed and Babikir, 2013). Equally important is the provision of adequate education about epilepsy to primary caregivers in all socio-demographic settings. This includes traditional healers and the public in general. Increasing the level of knowledge and understanding about epilepsy among these groups can harness the benefits of traditional medicine while avoiding practices that are potentially hazardous to patients. Well-designed randomized controlled trials are necessary to investigate the precise role and value of various CAM treatment options in PWE.

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Declaration of Competing Interest

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