Seizure 23 (2014) 328–332

Contents lists available at ScienceDirect

Seizure

journal homepage: www.elsevier.com/locate/yseiz

Review

Medicinal plants used in Iranian traditional medicine to treat epilepsy

Shamim Sahranavard [a,b,*], Saeedeh Ghafari [b], Mahmoud Mosaddegh [a,b]

[a] Traditional Medicine and Material Medical Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[b] Department of Traditional Pharmacy, School of Traditional Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article history:
Received 4 September 2013
Received in revised form 14 January 2014
Accepted 16 January 2014

Keywords:
Iranian traditional medicine
Epilepsy
Medicinal plants

ABSTRACT

Antiepileptic drugs used to treat epilepsy can cause severe, life threatening side effects. In Iranian traditional medicine, herbal remedies have been used for centuries to treat seizures. In this study, the five most important herbals in Iranian traditional medicine, namely Canon, al-Hawi, al-Abniah 'an Haqaeq al Adwia, Tuhfat al-Mu'minin, and Makhzan ul-Adwia, were searched for the term "sar-e", which means epilepsy, to identify the herbs used for treatment in ancient times. We also searched scientific literature for pharmacological evidence of their effectiveness.

Twenty-five plants were identified as herbal remedies to treat epilepsy. Pharmacological data related to the antiepileptic activity of eleven of these plants exists. A large number of these plants which have not been investigated pharmacologically for antiepileptic activity would be good candidates for study in exploring new herbal anticonvulsant remedies.

1. Introduction

The long term use of herbs introduced in traditional medicines confirms their value in drug discovery.[1,2] Based on historical evidence, herbal therapies were used to treat convulsive seizures for centuries.[3] Medicine has always played a significant role in Iranian culture and civilization. Thousands of years of history and hundreds of books have placed Iranian traditional medicine among the oldest and richest alternative medicines.[4,5]

Epilepsy is an important issue in the field of traditional Persian neuroscience. Iranian scientists such as Avicenna (Ibn Sina) and Rhazes (Zakariya al-Razi) defined epilepsy, described its signs and symptoms, and gave different approaches to prevent and treat it.[6]

It cannot be claimed with one hundred percent certainty that what was described in Iranian traditional medicine as epilepsy (sar-e) matches the same illness in conventional medicine, because of the lack of diagnostic equipment in that time. However, some signs and symptoms in both sar-e and epilepsy such as unconsciousness and seizure indicate that there is a resemblance and make the assumption more reasonable.

In this study, we investigated remedies listed in the most famous Iranian traditional medicine books as treatments for sar-e, and we selected those which were used most and were effective in managing the condition.

2. Material and method

The five books mentioned above were among the most important Iranian herbals dating from between the 10th and 18th centuries. In all the reviewed references, the term denoting epilepsy is 'sar-e'; therefore, it was the main keyword searched in the texts.

First the Canon of Avicenna was searched, as it is the most celebrated book in medicine. Thereafter, the plant names were searched in other books to find their usage as anticonvulsant remedies. Then these herbal medicines were scored based on the frequency of their mention in order to recognize the most valuable herbal drugs used to treat epilepsy through hundreds of years.

The plants used to treat epilepsy in Iranian traditional medicine were identified by matching their names with scientific names using different comprehensive glossaries including comparative descriptions of old medicinal plants.[7,8]

A substantial search of scientific databases such as "Google Scholar" and "Medline" for the plant names in combination with the terms 'epilepsy' and 'anticonvulsant' was performed to find the plants' possible anticonvulsive activities.

3. Literature sources

3.1. The Canon of Avicenna

The Canon, which means "The Law", was the most significant contribution made by the most famous Persian physician, Ibn Sina, known as Avicenna in the western world (980–1037 AD). It is the most influential textbook ever written. For six centuries, it

* Corresponding author at: Traditional Medicine and Materia Medica Research Center (TMRC), Shahid Beheshti University of Medical Sciences, P.O. Box 1516745811, Tehran, Iran. Tel.: +98 88773525; fax: +98 88776168.
E-mail address: ssahranavard@itmrc.org (S. Sahranavard).

1059-1311/$ – see front matter © 2014 British Epilepsy Association. Published by Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.seizure.2014.01.013

dominated the medical schools of Asia and Europe. The Canon surpassed other similar books on medicine and is considered the biggest medical encyclopedia of its time.[9]

Avicenna was the first person in medical history to use the term 'epilepsy', which means "being possessed by an outside force" in Latin. Ibn al-Nafis, a great Arab physician and scientist of his time, systematically described the symptoms and recovery of "head sick", which is a synopsis of the Canon written 250 years earlier.[10–12]

The Canon consists of five books. The first book is about general principles of medicine; the second book comprises the *materia medica*, which lists about 800 mineral, herbal, and animal-based medicinal materials; the third book is on therapy; the fourth book discusses those diseases that affect the body and are not restricted to a single part of the body, such as fevers; the final book presents recipes for compound drugs.[13,14]

Avicenna assigned a chapter of the Canon to epilepsy under the title 'Head and Brain Disorders'. From his point of view, there are two types of epilepsy: one that occurs suddenly and is over quickly, and one that is intense and continuous and may lead to death. In his opinion, epilepsy is a type of seizure which affects the brain.

Avicenna described symptoms of epilepsy as being weakness, forgetfulness, depression, nightmare, yellow tongue, tongue paresthesia, anger, and distress. He described an epileptic attack as follows: "The patient feels agitated and becomes unconscious, turns red, and stares with eyes distorted; respiration is impaired and the patient becomes cyanotic". Muscle contractions, dizziness, salivation, and teeth gnashing are other symptoms and signs.[6]

Avicenna theorized that the blockage of humors, especially phlegm and black bile, was a possible mechanism of epileptic convulsions.[15] In the Canon, he classifies epilepsy based on age (children, adults) and the organ in which the attack starts (liver, stomach, spleen, or uterus). He explains that some precipitating factors (environmental temperature, direct solar radiation, bathing or training with a full stomach, overwhelming anger, fear or sorrow, and dyspepsia) provoke epileptic attacks.

Avicenna explains the general recommendation (to avoid excessive heat or cold, excess sexual intercourse, swimming, and postprandial exercise) and states that therapy is based on the specific condition of the patient.

Plant-based antiepileptic therapy constitutes a great part of the treatments described in the Canon and other Iranian traditional medicine references.[16]

3.2. Al-Abniah 'an Haqaeq al Adwia

The oldest preserved Persian text on *materia medica* (10th century), al-Abniah 'an Haqaeq al Adwia (principles of the attributes of plants) written by Abu Mansur Movafaq ibn Ali al-Heravi, is an introductory treatise on medicine and pharmacy. The book deals with 584 mineral, herbal, and animal-based drugs. Each monograph includes the name of the drug and its synonyms in Greek, Indian, and local Persian dialects, its therapeutic effects, methods of countering the side effects, and the dosage of the drug.[17,18]

3.3. Al-Hawi fi al-Tibb

Before Avicenna's Canon, the best written work on medicine was al-Hawi fi al-Tibb (The Comprehensive Book of Medicine). It was written by Abu Bakr Mohammad ibn Zakariya Razi, known as Rhazes (865–925 A.D.), a renowned Iranian physician, philosopher, and chemist who wrote about 250 books and treatises. Al-Hawi is Rhazes' most important and complete book in which he surveyed Greek, Syrian, and early Arabic medicine, as well as some Indian medical knowledge. Throughout his work, he added his own considered judgment and his own medical experience as commentary. It was repeatedly printed in Europe during the 15th and 16th centuries under the title "Liber Continens", and it had a major influence on the development of medical practices in Europe.[19–21]

3.4. Tuhfat al-Mu'minin

This work is also known as Tuhfeh-ye Hakim Mu'min (1669 AD). It is a medical treatise written by Mir Muhammad Mu'min Husaini Tonekaboni, known as Hakim Mu'min, the physician and pharmacist to the court of the Safavid Shah Sulayman in Persia. It contains 5570 entries, of which 940 concern plants or products derived from plants.[22]

3.5. Makhzan ul-Adwia

Makhzan ul-Adwia (Drug Treasure) is an outstanding work about traditional medicine and medical terminology in 1772 AD. It was written in Persian by Mohammad Hossein Aghili Alavi Khorasani, a famous and expert physician. The book has 14 chapters and covers poisons and antidotes, temperaments, food as medicine, expiration and strengths of medicines. In it, 1744 simple drugs of plant or animal origin used in traditional medicine are described in detail.[23]

4. Results

The sources consulted in this work pointed out that 25 *materia medica* were used in Iranian traditional medicine to treat epilepsy. Table 1 shows their names, parts used, administration, and the references in which they are mentioned.

In the following section, the results of tests performed on 11 plants have been summarized; attention was focused on their anticonvulsant activity.

4.1. Paeonia officinalis *L.*

The root extract of *P. officinalis* (peony root) was identified as a potent in vitro inhibitor of neuron damage in the CA1 area of the hippocampus in rats. Data indicated that peony root extract has excellent protective effects on damaged neurons in addition to anticonvulsant action when administered orally.[24]

4.2. Bryonia alba *L.*

Ethanolic extract of the aerial parts of *B. alba* showed moderate affinity to the benzodiazepine-site of the GABA receptor. The $GABA_A$-benzodiazepine site is a primary target in the treatment of epilepsy that enhances the sensitivity of the $GABA_A$ receptor for endogenous GABA. After binding GABA to the receptor, the cell is inhibited and an anticonvulsant activity is achieved. Conversely, administration of the aqueous extracts showed no affinity for the GABA–benzodiazepine receptors.[25]

4.3. Ferula persica *Willd.*

The effects of ethanol extract of the aerial parts of *F. persica* on epilepsy have been evaluated in mice.[26] Results indicated that a dose of 300 mg/kg (i.p.) of ethanol extracts cannot prevent pentylenetetrazole (PTZ)-induced seizures; therefore, it does not possess anticonvulsant effects compared with the untreated animals at the used dose.

4.4. Lavandula stoechas *L.*

The effects of the aqueous-methanolic extract of *L. stoechas* flowers on epilepsy and spasm were evaluated in mice. Results