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Review



Review on Herbal medicines used in treatment of epilepsy

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	Abstract
Published on: 22 Dec 2023	<p>There are more than 10 million persons with epilepsy (PWE) in India., most of them are focused on the epidemiological aspects of epilepsy, genetic associations, identification, and validation of new AEDs in animal models of epilepsy, Very few studies are reported on understanding the process of electrogenesis, a dynamic process by which neurons begin to display abnormal firing patterns that cause epileptic seizures. Animal epilepsy models can be used for in depth studies; however, studies conducted on resected brain tissues from epilepsy patients are clinically relevant. Finally, more funding support from government and collaborations among basic research institutes, medical institutes, as well as industries is required to raise the standards of epilepsy research in India. This review focuses on the evaluation of the current status of epilepsy research in India and herbal medicines used in treatment of epilepsy.</p>
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INTRODUCTION

Epilepsy is one of the most common neurological diseases causing significant medical and social morbidity. Epilepsy is characterized by recurrent, usually unprovoked, epileptic seizures, as well as by the cognitive, psychosocial, and social consequences of this condition.¹⁻² The disturbances of neuronal activity that occur during seizures may result in strange sensations, emotions, and behaviors. They may also sometimes cause convulsions, abnormal movements, and loss of consciousness.³

Definition of Epilepsy

According to the most recent definition released by the International League Against Epilepsy (ILAE), epilepsy is a disease of the brain defined by any of the following conditions:
 (1) at least two unprovoked (or reflex) seizures occurring more than 24 h apart;

- (2) one unprovoked (or reflex) seizure and a probability of further seizures similar to the general recurrence risk (at least 60%) after two unprovoked seizures, occurring over the next 10 years; and
- (3) seizures occurring as symptoms of a known epilepsy syndrome. An epileptic seizure is a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain.⁵

CLASSIFICATION

- Partial seizures
- Simple seizures
(Without impairment of consciousness)
- With motor symptoms
- With special sensory or somatosensory symptoms
- With psychic symptoms
- Complex seizures
(With impairment of consciousness)
- Simple partial onset followed by impairment of consciousness². Impaired consciousness at onset
- Secondarily generalized
(partial onset evolving to generalized tonic-clonic seizures)⁴
- Generalized seizures
- Absence
- Myoclonic
- Clonic
- Tonic
- Tonic-clonic
- Atonic
- Infantile spasms
- Unclassified seizures
- Status epilepticus⁴

PARTIAL SEIZURES

Common, 80% patients' simple partial seizures: do not cause loss of consciousness

SIGNS & SYMPTOMS

motor – convulsive jerking, chewing motions, lip smacking
Sensory & somatosensory – paresthesia's, auras
Automatic – sweating, flushing, pupil dilation
Behavioral – hallucinations, dysphasia, impaired consciousness (rare).^{3,4}

PATHOPHYSIOLOGY

Epileptic seizures arise from an excessively syn-chronous and sustained discharge of a group of neurons. The single feature of all epileptic syn-dromes is a persistent increase of neuronal excitability. Abnormal cellular discharges may be associated with a variety of causative factors such as trauma, oxygen deprivation, tumors, infection, and metabolic derangements. However, no specific causative factors are found in about half of the patients suffering from epilepsy. Underlying causes and pathophysiological mechanisms are (partially) understood for some forms of epilepsy, e.g., epilepsies caused by disorders of neuronal migration and monogenic epileptic.^{4,5}

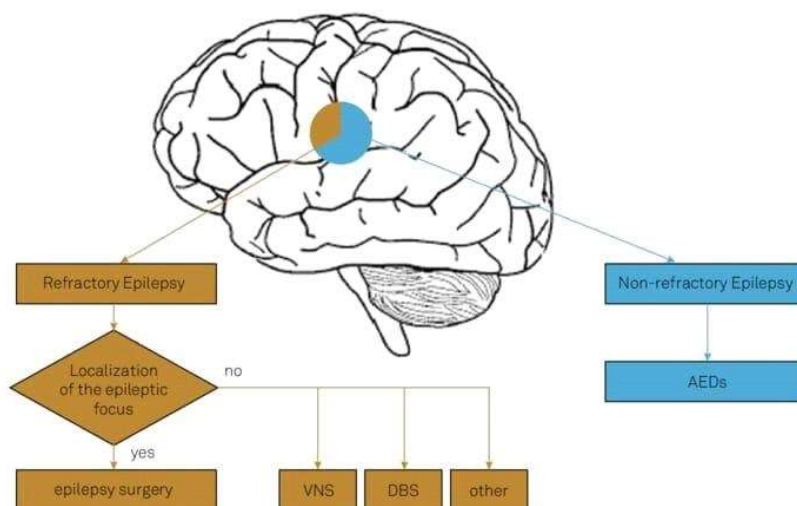


Fig 1: Epilepsy

HERBAL DRUGS USED IN TREATMENT OF EPILEPSY

Widespread and increasing interest in complementary and alternative medicines (CAMs), including herbal medicines. Herbal medicine is an area of CAM that is readily amenable to empirical research. Numerous herbal medicines have effects in the central nervous system and on hepatic metabolism, and thus have at least the theoretical potential for affecting seizures in patients with epilepsy and interacting with some antiepileptic medications.⁵

SCUTELLARIA BAICALINASE (SKULLCAPS)

S. baicalensis (Lamiaceae) is one of the most important medicinal herbs in traditional Korean medicine. Flavonoids from *S. baicalensis* may exert pharmacologically and clinically important profiles; including anxiolysis, ant convulsion, myorelaxation, and sedation; because they have high affinity for the benzodiazepine binding site of GABA-A receptors. The total extract from *S. baicalensis* partially blocked suppression of locomotion as well as behavioral changes induced by electroshock stress.⁶

MAGNOLIA GRANDIFLORA (HIM-CHAMPA)

The ethyl ether (EE) and hydroalcoholic extract (HE) of *Magnolia grandiflora* L. (Magnoliaceae) seeds orally administered in a single dose of 250 and 200 mg/kg, exhibited abolition of the extensor reflex of maximal electric induced seizure test in 50 and 40% of the experimental animals, respectively. They significantly prolonged the sleeping time induced by pentobarbital.⁷

BRAHMI GHRITA

A polyherbal formulation Brahmi ghrita belongs to family Scrophulariaceae (Figure1) a polyherbal formulation containing *Bocopa monneria* (4%), *Evolvulus alsinoids* (4%), *Acorus calamus* (4%), *Sassurea leppa* (4%), these are uniformly mixed & blended with cow's ghee (84%), prepared as a suspension with 1% acacia. It is used on the Swiss albino mice (25g). These formulation exhibits reduced alertness, spontaneous locomotory activity. It also antagonizes the behavioral effect of d-amphetamine. It protects the mice from electroshock and pentylene tetrazole induced convulsion.⁸

PASSION FLOWER

Leaves and flower Passion flower (Figure 2) belongs to family Passifloraceae. It is used as a traditional anticonvulsant drug in Europe and South America. Its hydro-alcoholic extract is given to PTZ induced model on mice. Pasipay (0.4mg/kg), diazepam (0.5-1mg/kg) & normal saline (10ml/kg) are introduced 30 min. before PTZ. Time taken before onset of clonic convulsion, duration and percentage of seizure and mortality protection were recorded. Result found that Pasipay prolonged the onset time of seizure and decreased the duration of seizure as compared to saline.⁹



Fig 2: Passion Flower

ARGYREIA SPECIOSA

Leaves *Argyrea specio* belongs to family Convolvulaceae. *Argyrea speciosa* extract was given to mice in 100, 200, 400 mg/kg for 10 days and then subjected to PTZ or maximum electroshock seizure treatment. The hydroalcoholic extract *Argyrea speciosa* at the dose of 200 and as onset of the death in unprotected mice and exhibited protection in 16.66% and 33.33% 400 mg/kg significantly delayed and latency to the onset of first clonus as well of PTZ treated mice respectively, In case of maximal electroshock seizure, the dose of 200 and 400 mg significantly reduced the duration of hind limb extension and both dose were statistically found to be equipotent compared to reference standard, clonazepam (0.1mg/kg) and phenytoin (20mg/kg) while provided complete protection.¹⁰

CONCLUSION

The goal of treating patients with epilepsy is to control seizures completely without causing unacceptable side effects. In the past several years, a number of new antiepileptic drugs have become available, and more will soon be released. Currently, there's not enough scientific proof that most herbal remedies successfully treat epilepsy. Most evidence is anecdotal. The Food and Drug Administration (FDA) also doesn't regulate herbal supplements. Herbs sometimes cause unpleasant side effects such as headaches, rashes, and digestive problems. In 2018, the Food and Drug Administration (FDA) approved a deep brain stimulation (DBS) device, manufactured by Medtronic, that sends electrical pulses through the brain to reduce the frequency of seizures. (It works by stimulating an important relay station deep in the brain called the thalamus).

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