

A PROSPECTIVE STUDY ON PREVALENCE OF EPILEPSY DISORDERS AND DRUG UTILIZATION PATTERN

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ABSTRACT

Objective: Epilepsy is the second most common neurologic disorder after stroke. The study was undertaken to determine the prevalence of epilepsy disorders and drug utilization pattern in a patient population of Dehradun. This study was conducted in a private health clinic.

Methods: A questionnaire was prepared that includes many practical questions regarding epilepsy seizure type, medication prescribed, their health status, and compliance. A total of 200 cases of epilepsy were reported.

Results: The study showed the prevalence of epilepsy disorders which was most common among males (65%) as compared to females (35%). 44% of epilepsy disorders were found prevalent among the age group between 30 and 40 years. The most common type of epilepsy disorder is primary generalized seizure (62%) followed by partial seizures (23%), focal disorder (6%), grand mal cortical focal epilepsy (5%), typical seizures (3.5%), refractory seizures (3%), and others (2.5%).

Conclusion: Epilepsy is one of the most serious neurological disorders in terms of both prevalence and cumulative incidence. Good education and counseling is required for coping up the challenges of this condition as well for improving patient compliance. For decreasing the chances of adverse effects and avoiding drug interactions monotherapy is important. Health-care providers and patients can together formulate a better therapeutic plan for achieving a seizure-free status without adverse effects.

Keywords: Seizures, Antiepileptic drugs, Compliance.

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INTRODUCTION

About 10% of people will have one seizure in their lifetime and about a third of them will go on to develop epilepsy [1,2]. It is a disorder that can occur in all mammalian species, probably more frequently as brain has become more complex and also remarkably uniformly distributed around the world. There are no racial, geographical or social class boundaries, it occurs in both sexes, at all ages, especially in childhood, adolescence and increasingly in ageing populations [3,4]. About 10% epileptic seizures may cause convulsions if the motor cortex is involved. The seizures may involve visual, auditory, or olfactory hallucinations if the parietal and occipital cortex plays a role.

Although drug therapy is the most widely effective mode for the treatment of epilepsy, it is not hundred percent effective in all patients. For example, it is frequently hindered by poor patient adherence, and often it is complicated by drug interactions. However, seizures can be controlled completely in approximately 50% of epileptic patients and a meaningful improvement is achieved in at least half of the remaining patients. An epileptic seizure is a transient paroxysm of uncontrolled discharges of neurons causing an event that is discernible by the person experiencing the seizure and/or by an observer. The tendency to have recurrent attacks is known as epilepsy; by definition a single attack does not constitute epilepsy. A patient with epilepsy will show recurrent epileptic seizures that occur unexpectedly and stop spontaneously [5,6].

Epilepsy has a focal origin in the brain. It manifests from the site of the focus, regions into which the discharges spread. Most of the cases are primary (idiopathic), some may be secondary to trauma/surgery on head, intracranial tumor, tuberculoma, cysticercosis, cerebral ischemia,

etc. Epilepsies have been classified variously: Major types are given in Table 1 [4].

Treatment of epilepsies

Antiepileptic drugs suppress seizures but do not cure the disorder; the disease may fade out though after years of successful control. Control and prevention of all seizure activity is the aim of antiepileptic drugs at an acceptable level of side effects. Selection of an anticonvulsant medication depends on an accurate diagnosis of the epileptic syndrome. Some anticonvulsants (e.g., lamotrigine, topiramate, and valproic acid) have multiple mechanisms of action and some (e.g., phenytoin and carbamazepine) have only one known mechanism of action, anticonvulsant agents can be divided into large groups based on their mechanisms are given in Table 2 [6].

METHODS

The study has been conducted to observe the prevalence and drug utilization pattern in epileptic patients in a private health clinic. The main objectives include investigation of the prevalence of epilepsy disorders, types, determination of gender wise and age wise distribution of epileptic patients and observation of their drug utilization pattern. This study included 200 subjects, after informing them about the purpose of the study and prior consent. A questionnaire was prepared that includes many practical questions regarding disease condition, medication prescribed, health status, and patient compliance. Table 3 shows the questions which were asked from the epileptic patient.

RESULTS

This study included 200 epileptic patients among which 130 (65%) were males and 70 (35%) were females (Fig. 1). The age wise

Table 1: Classification of major types of epilepsy [4]

Types	Description
Generalized seizures GTCS, major epilepsy, grand mal epilepsy	It is the most common disorder, lasts 1-2 min. Aura-cry- unconsciousness-tonic spasm of all body muscles- clonic jerking followed by prolonged sleep and depression of all CNS functions
Absence seizures (minor epilepsy, petit mal)	It last about ½ minute, prevalent in children Momentary loss of consciousness, patient apparently freezes and stares in one direction, no muscular component or little bilateral jerking. EEG shows characteristic 3 cycles per second spike and wave pattern
Atonic seizures (Akinetic epilepsy)	Unconsciousness with relaxation of all muscles due to excessive inhibitory discharges patient may fall
Myoclonic seizure Infantile spasms (hypsarrhythmia)	Shock like momentary contraction of muscles of limb or the whole body Seen in infants. Probably not a form of epilepsy. Intermittent muscles spasm and progressive mental deterioration. Diffuse changes in the inter seizure EEG are noted
Partial seizures SPS, cortical focal epilepsy	Often secondary, last ½-1 minute. Convulsion are confined to a group of muscles or localized sensory disturbance depending on the area of cortex involved in the seizure, without loss of consciousness
CPS, temporal lobe epilepsy, psychomotor	Attacks of bizarre and confused behavior and purposeless movements, emotional changes lasting 1-2 minutes along with impairment of consciousness. An aura often proceeds. The seizure focus is located in the temporal lobe
Simple partial or complex partial seizures secondarily generalized	The partial seizure occurs first and evolves into generalized tonic-clonic seizures with loss of consciousness

GTCS: Generalized tonic-clonic seizures, SPS: Simple partial seizure, CPS: Complex partial seizures

Table 2: Anticonvulsant drugs with their mechanism of action

Mechanism of action	Drugs
Blockers of repetitive activation of the sodium channel	Phenytoin, carbamazepine, oxcarbazepine, lamotrigine, topiramate
Enhancer of slow inactivation of the sodium channel	Lacosamide, rufinamide
GABA-A receptor enhancers	Phenobarbital, benzodiazepines, clobazam
NMDA receptor blockers	Felbamate
AMPA receptor blockers	Perampanel, topiramate
T-calcium channel blockers	Ethosuximide, valproate
N- and L-calcium channel blockers	Lamotrigine, topiramate, zonisamide, valproate
H-current modulators	Gabapentin, lamotrigine
Blockers of unique binding sites	Gabapentin, levetiracetam
Carbonic anhydrase inhibitors	Topiramate, zonisamide
Neuronal potassium channel (KCNQ [Kv7]) opener	Ezogabine

GABA: Gamma-aminobutyric acid

Table 3: Questionnaire

Questions were asked regarding
Types of epilepsy disorders
Medication prescribed
Patient compliance for medication

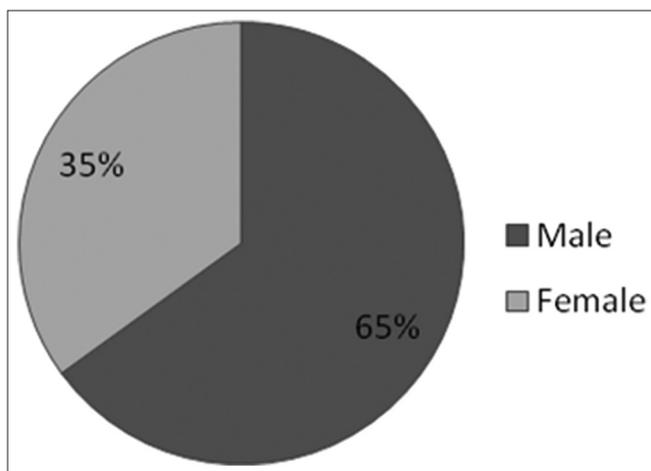


Fig. 1: Gender wise distribution of epileptic patients

distribution of epilepsy disorders showed that 44% of disorders were prevalent among age group between 30 and 40 years (Fig. 2). This study highlighted that primary generalized seizures (62%) were most common among the concerned epileptic patients (Fig. 3).

Table 4 shows the type of epilepsy disorders among male and female patients and their total percentage of prevalence. Grand mal epilepsy (66%) is the major type of generalized seizures prevalent among male patients. Table 5 shows the antiepileptic drugs given for a particular type of epilepsy disorders. Benzodiazepine, phenytoin, and valproate are the most commonly prescribed drugs categories. It was also found that some other drugs were prescribed such as Aciloc and multivitamins, along with antiepileptic drugs. This study also revealed that 04% of patients in the age group 60-70 years were noncompliant for their medication due to given reasons such as faces difficulty in swallowing, forget to take medicines, and poor economic status.

DISCUSSION AND CONCLUSION

The goal of treatment is to achieve a seizure-free status without adverse effects. Monotherapy is important, because it decreases the likelihood of adverse effects and avoids drug interactions. Adaption of treatment decisions to the characteristics of the individual is the key to optimum epilepsy management. Antiepileptic drugs monotherapy is indicated after two seizures, but in high-risk patients initiation of treatment after one seizure might be justifiable. Dose titration and

Table 4: Epilepsy types and their percentage of prevalence among male and female

Type	Male (n=130)	Female (n=70)	Total (n=200)	Percentage (n=200)
Primarily generalized seizures	90	34	124	62
Grand mal epilepsy	66	22	88	44
Status epilepticus	08	03	11	5.5
Infantile spasm	04	02	06	3
Myoclonic seizures	04	03	07	3.5
Atonic seizures	02	-	02	1
Petit mal epilepsy	06	04	10	5
Partial seizures	14	12	26	13
CPS	14	04	18	9
SPS	-	08	08	4
Focal disorder	10	02	12	6
Refractory seizures	-	06	06	3
Grand mal cortical focal epilepsy	08	02	10	5
Cebrile convulsions	-	05	05	2.5
General dilation of ventricles	05	-	05	2.5
Head injury	-	05	05	2.5
Typical seizure	03	04	07	3.5

CPS: Complex partial seizures, SPS: Simple partial seizures

Table 5: Drug treatment given to epileptic patients

Disease	Antiepileptic drugs	Other drugs given
Status epilepticus	Phenytoin (phenytral), valproate (valvorin), carbin SR (carbamazepine) cecozam (diazepam)	-
GTCS	Carbamazepine - SR, secozam (diazepam), clobazam (clonazepam), calmpose (diazepam), serpex (oxazepam)	Aciloc multivitamins
Refractory seizures	Clobazam, secozam	-
Petit mal epilepsy	Encorate (Sod. valproate)	Syrup i-vit B-complex
Grand mal, cortical focal, and psychomotor epilepsy	Phenytoin-SR (fentain) phenobarbitone	Syrup i-vit
Infantile spasm	Clonazepam	
Cortical focal seizures	Phenytoin (phenytoin) diazepam (secozam)	Aciloc
Febrile convulsions	Diazepam (calmpose)	
Atonic seizures	Clonazepam secozam	Aciloc
Head injury	Divalproex, carbin-SR, tegretol, secozam	-
Typical seizure	Clonazepam, secozam	Syrup i-vit
Complex seizure	Carbital, phenytoin	Syrup i-vit Aciloc
Grand mal epilepsy	Divalproex, secozam, libralax	Aciloc

GTCS: Generalized tonic clonic seizures

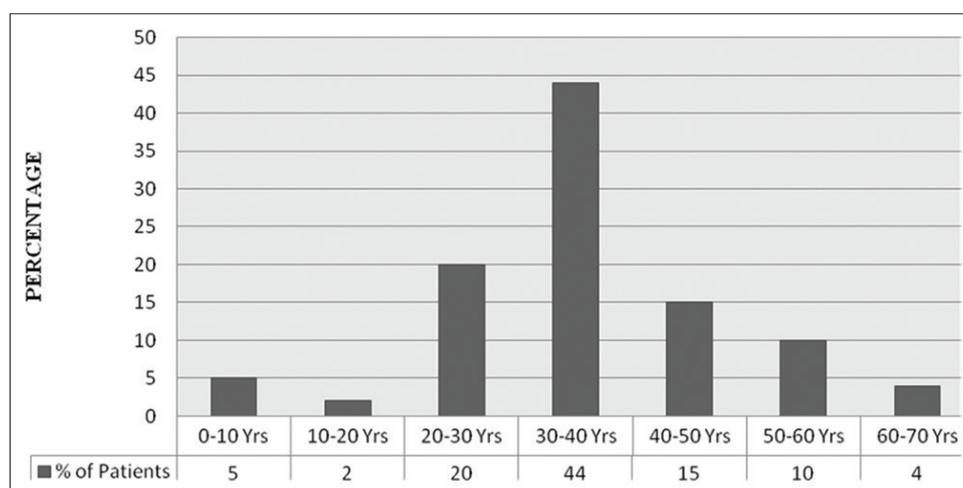


Fig. 2: Age wise distribution of epileptic patients

dosing regimens also need to be carefully individualized. Combination therapy can be beneficial in patients who did not respond to two or three sequential monotherapy, although in some cases earlier institution of polytherapy might be justified. The clinical signs

and symptoms of seizures depend on the location of the epileptic discharges in the cerebral cortex and the extent and pattern of the propagation of the epileptic discharge in the brain. A key feature of epileptic seizures is their stereotypic nature.

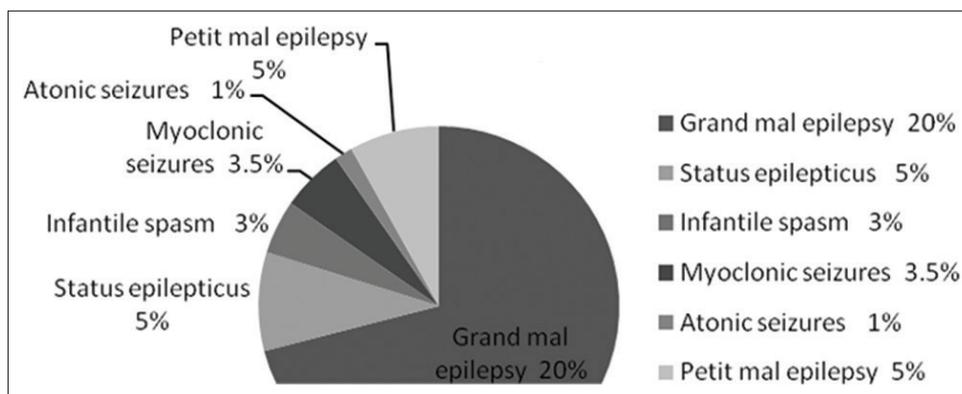


Fig. 3: Prevalence of primary generalized seizure

General principles for the symptomatic treatment of seizures with antiepileptic drugs:

- Choice of drugs and dose is according to the seizure type and need of individual patient. Early initiation of treatment, as each seizure episode increases the propensity to further attacks.
- Start with a single drug, preferably at low dose-gradually increase dose till full control of seizures or side effects appear. If all reasonable monotherapy fails, use combinations.
- Therapy should be as simple as possible. A seizure diary should be maintained.
- When women on antiepileptic therapy conceive, antiepileptic drugs should not be stopped. Discontinuation of therapy carries high-risk of status epilepticus. To avoid the chances of birth defects, an attempt to reduce the dose of drugs should be cautiously made.

Apart from these general principles of treatment, we concluded that the choice of antiepileptic drugs is primarily based on efficacy and effectiveness for the individual's seizure type, but other patient-specific factors need to be considered which includes age, sex, childbearing potential, comorbidities, concomitant medications, and patient compliance [7]. The patient may discontinue the drug if they achieve seizure control after at least 2-4 years of seizure freedom and also after careful assessment of potential benefits versus the risk of relapse and related implications.

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