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## The Prescribing Pattern of Anti-Epileptic Drugs by General Practitioners in a Semiurban Area

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### Abstract

**AIM:** To study the prescribing pattern of antiepileptic drugs in a semi urban area by general practitioners attending general practitioners in a semi urban area were analyzed. Totally 100 prescriptions were collected and demographic data, disease data, treatment data, and adverse event profile were analyzed  
**Results:** 100 patients were included in the study out of which 55 were males and 45 were females. 80 patients were used only older/conventional AEDs. Only 5 patients were on newer AEDs. Newer AEDs were used as an add on therapy in 6 patients. Monotherapy (55%) was prescribed more than the polytherapy (45%). Phenytoin was the most commonly prescribed drug as monotherapy followed by phenobarbitone. a total of 240 AEDs were prescribed to a total of 100 patients to an average of 2.4 drugs per prescription. GTCS was the predominant form of seizure type presented (90%) followed by other types. 26 patients reported adverse effects of which 18 were males and 8 were females.  
**Conclusion:** the AED of choice for different seizures were accordance with the recommended guidelines. The ultimate goal in treating epilepsy is to achieve a seizure free state with minimal or no side effects due to medications.

**Keywords:** antiepileptic drugs, prescribing pattern, private practitioners, Semi urban area.

### 1. Introduction

Epilepsy affects 0.5 to 1% of the population (50 million people worldwide) [1]. It is one of the most common neurological disorder characterized by spontaneously recurring seizures. An epileptic seizure is a transient occurrence of signs and / or symptoms due to abnormal excessive synchronous activity in the brain [2]. Epileptic convulsions have negative consequences on the patient's psychological and social life such as relationships, education and employment. Uncontrolled seizures are associated with physical and psychosocial morbidity, dependent behavior, poor quality of life and an increased risk of sudden unexpected death. Therefore, it is mandatory to treat epilepsy with antiepileptic drugs (AEDs) as soon as the patient has reported more than one documented or witnessed seizure [3]. The goal of treatment should be to maintain a normal a life style through complete seizure control with no or minimal side effects.

The causes may be idiopathic or secondary to trauma, infection, ischemia or the presence of a malformation or mass lesion. There is often progressive damage, hyper excitability and convulsions occur [4]. Management of epilepsy at rural and semi urban are still primitive due to non-availability of specialists. These drugs are not very safe and there are number of drug interactions. Since epileptic patients are managed by general practitioners, it is important to know the prescribing pattern in rural and semiurban area.

### 2. Objectives

1. To study the prescription pattern of anti-epileptic drugs by general practitioners in a semi urban area.
2. To assess the adverse drug reactions to AEDs.

### 3. Materials and Methods

The study was carried out by analyzing prescriptions given by general practitioners to patients suffering from epilepsy in VILLUPURAM, a semi urban area in tamilnadu state. Totally 100 prescriptions were analyzed over a period of three months. All patients diagnosed with epilepsy being treated with one or more anti-epileptic drugs (AED) were included in the study. It was conducted as an observational study and descriptive analysis done. The data were collected in a case record form (CRF) specifically designed for the study. It consisted of

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- i. **Demographic data:** patient’s name, age, gender, address, background, socioeconomic status. The patient’s education, occupation, average monthly income, and number of dependents were factored in for assessing the socioeconomic status.
  - ii. **Disease Data:** Seizure type, etiology and frequency, age of onset of seizure y duration, control of seizures, time since last seizure, and family history of epilepsy and presence of other co-morbidities.
  - iii. **Treatment Data:** Details of treatment including generic names of drugs/s, daily doses, duration of treatment and past treatments.
- Therapy given to these patients was classified into monotherapy i.e., patients receiving single AED for seizures and polytherapy i.e., patients receiving two or more drugs. In this study phenytoin, phenobarbitone, carbamazepine and valproate were considered as “Conventional” or “Older” AEDs. Levetiracetam, oxcarbazepine, clobazam, clonazepam, topiramate, zonisamide and gabapentin were classified as “Newer” AEDs.
- iv. **Adverse event profile:** We evaluated some of the more commonly observed adverse effects of antiepileptic drugs.

**4. Results**

**Patient characteristics and demographic profile**

Out of the 100 patients, 55 were male and 45 were females. Of these 40 were newly diagnosed patients and 60 patients were on treatment for more than one year. The median age of the study patients was 32 years with 48% of patients between 18 and 30 years. Majority of patients belonged to the poor and lower middle socioeconomic status.

**Table 1:** Profile of type of seizures

Type of seizure	No of Cases (n=100)
GTCS	90
Complex Partial Seizures	4
Simple partial seizures with Secondary Generalization	2
Generalized seizures with Myoclonic jerks	1
Simple partial Seizures	2
Absence Seizures	1

**GTCS:** Generalized tonic clonic seizures.

Table 1: Shows the distribution of type of seizures among patients 90 patients had generalized seizures whereas 4 had complex partial seizures 2 patients had simple partial seizures with secondary generalization and 1 had generalized seizures with myoclonic jerks. The other types were simple partial seizures and absence seizures.

**Table 2:** Pattern of AEDs prescribed

No. of drugs prescribed	Number of cases
Monotherapy	55
Poly therapy	45

The pattern of AEDs prescribed is presented in Table 2 of 100 patients, 80 patients were prescribed only conventional / older AEDs. Only 5 patients were on newer AEDs monotherapy. Newer AEDs were used as add on-therapy in 6 patients.

**Table 3:** Newer AEDs prescribed in study

Newer AED	No. of cases
levetiracetam	9
Oxcarbazepine	1
Clonazepam	1
pregabalin	11
topiramate	3
lamotrigene	3

Phenytoin was used most commonly (52%) as monotherapy drug followed by phenobarbitone (22%). Phenytoin + phenobarbitone combination was most commonly used dual therapy (25%) followed by phenobarbitone + sodium valproate (19%) combination. A total of 240AEDs were prescribed to a total of 100 patients during study period, which corresponded to an average of 2.4 AED per patient.

**Table 4:** Overall AED utilization

AED	PERCENTAGE
Phenytoin	60%
Phenobarbitone	22%
Valproate	24%
Carbamazepine	18%
Newer drugs	11%

**Table 5:** Commonly prescribed AED according to type of seizure

Type of seizure	Most commonly used AED
GTCS	Phenytoin
Complex Partial Seizures	Carbamazepine
Simple Partial Seizures with Secondary Generalization	Phenytoin
Generalized Seizures with Myoclonic Jerks	Sodium valproate

Phenytoin was the most commonly used AED for treatment of GTCS and simple partial seizures with secondary generalization. Carbamazepine was the most commonly used drug in complex partial seizures. In case of generalized seizures with myoclonic jerks, sodium valproate was the most commonly used drug.

**Pattern of Adverse Events**

26 patients reported side effects out of which 18 patients were males and remaining 8 were females. The most common side effects involved the central nervous system and included drowsiness, tiredness, cognitive impairment, headache, etc.; these were self limiting and subsided with continued treatment. Weight gain was reported in two patients and loss of libido in one patient, who were on valproate. Gingival hyperplasia was the most common side effect reported due to phenytoin in 10 patients and such cases were referred to the dentist for treatment.

Hypersensitivity reactions were observed with carbamazepine and phenytoin and managed appropriately. Skin rashes due to carbamazepine was reported following which patient was changed to sodium valproate.

**Table 20:** Adverse effects profile

Adverse effects	Number of patients
Gingival hyperplasia	10
Sedation	13
Gastrointestinal	7
Dizziness	6
Osteomalacia	4
Facial coarsening	4
Vertigo	3
Dermatological	3
Weight gain	2
Tremors	2

All ADRs were of mild to moderate severity on Modified Siegle’s severity assessment scale.

## 5. Discussion

Epilepsy remains one of the most commonly prevalent disease in society affecting 0.5-1% of population in India. Predominantly, younger individuals are predominantly affected by epilepsy. Because of the stigma attached to it, it becomes imperative to treat disorder as effectively as possible<sup>5</sup>. Despite the availability of a number of AEDs for the treatment of epilepsy, the prospect of freedom from seizures and side effects remains elusive for many patients with epilepsy.

The main aim of the treatment of epilepsy is to make the patient completely seizure free, or to reduce seizure frequency and severity if the patient's seizures cannot be completely suppressed. The standard treatment of epilepsy is optimal use of AEDs. Efficacy of an AED refers to its effectiveness in preventing or reducing the recurrence of a particular seizure type. Potential AED side effects and their occurrence in population not only affect the physician's choice but also determine the acceptance of the drug by the patient. For example, physicians may not use valproate in female patients who are planning to have children because of its teratogenic side effects.

Other factor which may affect AED use is the place of practice of prescribing physician. For example, in rural and semi urban areas the practicing doctors are not very familiar with using newer antiepileptics. The availability of specialists are also limited. So the conventional AEDs are prescribed more commonly by the practitioners the Pharmacovigilance activity also very limited in semi urban areas. Cost of AEDs and affordability of patients is one of the most important factors in deciding which drug to prescribe in a given patient. Though newer AEDs are more efficacious and less toxic than conventional AEDs, there are presently costlier. This

study analysed utilization of AEDs in 100 adult patients observed and followed up in general practice. The present study was an observational, descriptive, pharmacoepidemiological study. Similar to earlier studies generalized tonic clonic seizures (GTCS) were the most common type of seizures affecting approximately 90% of the patients followed by complex partial seizures affecting 4% of the patients<sup>16, 71</sup>. Simple partial seizures with secondary generalization and generalized seizures with myoclonic jerks accounted for 1% each. Only one case each of simple partial seizures and absence seizures (AS) were seen in this study.

Therapy of epilepsy requires lot of clinical and therapeutic skill. It is important to maintain patients on monotherapy as compliance is better, side effects are less and there is no possibility of drug-to-drug interactions. If the dose of AED is individualized for every patient by gradually increasing the dose to maximum tolerated dose, seizures can be controlled in many patients by monotherapy alone. Every patient has his/her own optimum dose of AED<sup>181</sup>.

In this study, monotherapy was prescribed more frequently than polytherapy and the results are comparable to earlier studies<sup>191</sup>. Phenytoin alone was most commonly used as monotherapy prescribed to 38 patients (46.91%) followed by phenobarbitone in 20 cases. Only 3 patients received a newer AED as monotherapy. Clobazam was used as monotherapy in 2 patients and oxcarbazepine was used as monotherapy in 1 patient. In remaining 8 patients clobazam and clonazepam were used as add-on therapy. These findings are in accordance with guidelines for the management of epilepsy in India which recommends that it is preferable to use a conventional AED as the initial drug since these are less expensive and the side

effects with long-term use are well known<sup>10</sup>. Sodium valproate was used in 13 patients and carbamazepine in 7 patients as monotherapy. Among the 45 patients on polytherapy, majority received two drugs (78%) followed by triple therapy in 22% of patients. Eight different combinations were used in dual therapy, most common being phenytoin and phenobarbitone followed by a combination of phenytoin and valproate.

## Conclusion

Our study revealed that the conventional AEDs are commonly used in semi urban area. The use of newer AEDs is still minimal. This may be because of lack of experience in using newer AEDs and non-availability of specialists. Serious adverse effects are not reported in our trial. The cost of therapy is also bearable to lower socioeconomic group.

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