

# Prescription Pattern analysis and utilization of antiepileptic drugs in a tertiary care hospital in Kanchipuram

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## Abstract

**Background:** People suffering from epilepsy requires a long period of treatment and regular monitoring. Extensive use of antiepileptic drugs warrants critical monitoring to suggest appropriate clinical use and safety considerations. **Objectives:** The study was aimed to analyse the prescription pattern of antiepileptic drugs in a tertiary care hospital in Kanchipuram. **Methodology:** This was a prospective, observational study conducted in outpatient departments at Meenakshi medical college Hospital and Research institute. Institutional ethical clearance was obtained. **Results:** Monotherapy were prescribed among 69.9% of patients and 30.08% of patients received polytherapy. levetiracetam (23.8%) was the most prescribed drug followed by benzodiazepines (16.8%), hydantoin drugs such as phenytoin, fosphenytoin (11.5%), valproic acid(10.6%) and iminostilbenes such as carbamazepine and oxcarbazepine(5.3%). AEDs were more prescribed only for seizure disorder (79%) than any other disease conditions. **Conclusion:** A shift from the use of conventional antiepileptic drugs to the newer AED's was observed, which dominated the pharmacotherapy of epileptic seizures. This would form a part of pharmacoepidemiology and will update the treatment guidelines benefitting the physicians regarding optimal use of antiepileptic drugs.

**Keywords:** newer antiepileptic agents, prescription, epilepsy, utilisation.

## INTRODUCTION

Epilepsy is a common neurological disorder affecting 2-5% of population worldwide.<sup>[1]</sup> People suffering from epilepsy requires a long period of treatment and regular monitoring. A large variety of antiepileptic drugs are available for its treatment. Conventional drugs like valproic acid, phenobarbitone, carbamazepine, phenytoin and ethosuximide are the first line drugs in our country which are frequently used because they are less expensive and their adverse effects profile are well known to the physicians.

Newer anticonvulsant drugs like gabapentin, vigabatrin, lamotrigine, topiramate, tiagabine and zonisamide are claimed to have fewer adverse effects but are more expensive compared to the earlier mentioned drugs. These drugs currently used as adjuvant/add-on / alternative therapy in different types of epilepsy.<sup>[2,3]</sup>

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Moreover, polytherapy is required and recommended in patients suffering from epilepsy of multiple seizure types and are in refractory disease state.<sup>[4]</sup>

Many of the above antiepileptic drugs also find application in the treatment of neuropathic pain, migraine and psychiatric disorders.<sup>[5]</sup> Thus the utility and prescribing pattern of antiepileptic drugs has enormously widened with large number of patient population. These drugs have different mechanism of action and are proposed to contribute to various adverse reactions and drug- drug interactions. Hence, extensive use of antiepileptic drugs warrants critical monitoring to suggest appropriate clinical use and safety considerations. The main purpose of the present study will be to analyse the utilisation of antiepileptic drugs in different clinical indications in a tertiary care hospital in Kanchipuram. Compilation and analysis of such prescription patterns will form a part of pharmacoepidemiology and will update the treatment guidelines benefitting the physicians.<sup>[6]</sup>

## OBJECTIVES:

To analyse the prescribing pattern utilization of antiepileptic drugs in non-epilepsy disorders and epilepsy.

To assess the drug regimens (polytherapy or monotherapy) used in different clinical conditions.

## MATERIALS AND METHODS:

This was a prospective, observational study conducted in outpatient departments at Meenakshi medical college Hospital and Research institute, Kanchipuram for a period of two months from December 2020 to January 2021. Approval was obtained from institutional ethics committee. Informed consent was obtained from each patient participating in the study.

Inclusion criteria:

Age group - above 15 Years Both gender

Idiopathic epilepsy

Known case of epileptics and are on antiepileptic drugs

Prescription consisting of an antiepileptic drug for non-epilepsy disorders.

Exclusion criteria:

Pregnant and lactating women.

Prescriptions prescribed during the period of study & which contained at least a single antiepileptic drug were selected. Details about the demographic profile, clinical indications, pharmacological classes of antiepileptic drugs used, its dosage & frequency has been noted in a preformed performa.

WHO prescription indicators:

Average no. of drugs prescribed per patient per encounter:  
Total number of drugs in all prescriptions divided by the number of prescriptions

Percentage (%) of drugs prescribed under generic name:  
Prescribed number of drugs in generic name divided by total number of drugs prescribed x 100.

Percentage of encounters with an antibiotic prescribed:  
Number of prescriptions with antibiotics divided by total number of prescriptions x100.

Percentage of encounters with an injection prescribed:  
Number of prescriptions having injections divided by total number of prescriptions x100.

Percentage of medicines from Essential drug list prescribed:  
Number of drugs prescribed from the NLEM of India registry divided by the total number of drugs prescribed x100.

These WHO indicator values were obtained and compared to the recommended optimal values given by WHO.<sup>[7]</sup> Analysis was done using Statistical Package for Social Science (SPSS) version 23. Descriptive statistics was used.

## RESULTS:

In the present study, out of 96 patients 46 patients were male and 50 patients were females. The most common age group to be affected was in between 25-40 and above 40 years of age followed by 15-25 years of age as shown in Table 1. Out of the 249 drugs prescribed in total for the 96 patients, the drugs prescribed by the generic name were 56 which were 22% and the drugs prescribed by brand name were 193 which was 78% as depicted in figure 1. Among the 249 drugs prescribed, 113 drugs belongs to antiepileptic group of classification. In which, 37 belong to newer generation of antiepileptic drugs and 76 of older antiepileptic drugs.

Out of 96 patients, About 79 patients (69.9%) were prescribed with monotherapy and polytherapy were prescribed to 17patients (30.08%). Most Frequently used drugs in Monotherapy were Levetiracetam (23.8%),Benzodiazepines (16.8%), Hydantoin ( 11.5%), valproate (10.6%), Iminostilbene (5.3%), lamotrigine (1.7%) as shown in figure 2.

Drugs used in polytherapy were combinations of Levetiracetam & sodium valproate which was 0.8% ,clonazepam & sodium valproate which was 0.8% , Levetiracetam & clobazam which was 4.4% ,phenytoin and clobazam was 1.7%, sodium valproate & clobazam was 2.6%, Levetiracetam & clonazepam was 0.8%, oxcarbazepine & clobazam was 1.7%, alprazolam & clobazam was 0.8% and Levetiracetam & Alprazolam which was 0.8% as shown in figure 3.

Antiepileptic drugs (AED's) prescribed for seizure disorder accounts to 79.1%, depression (8.3%), bipolar & schizopenia (4.1%), alcohol dependence (3.1%), anxiety

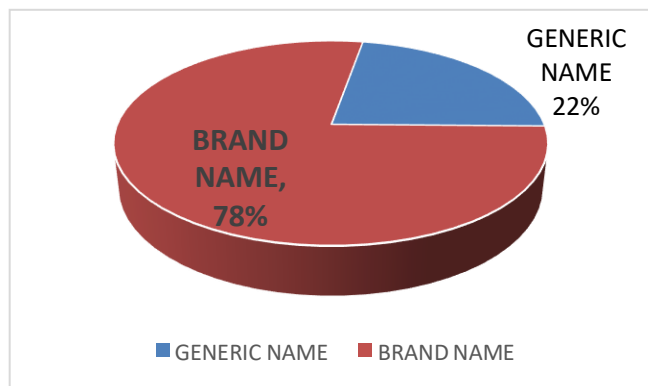
disorders (3.1%) and in acute CVA (2%) as shown in figure 4.

Results on analysing the WHO – Prescription indicators are as follows:

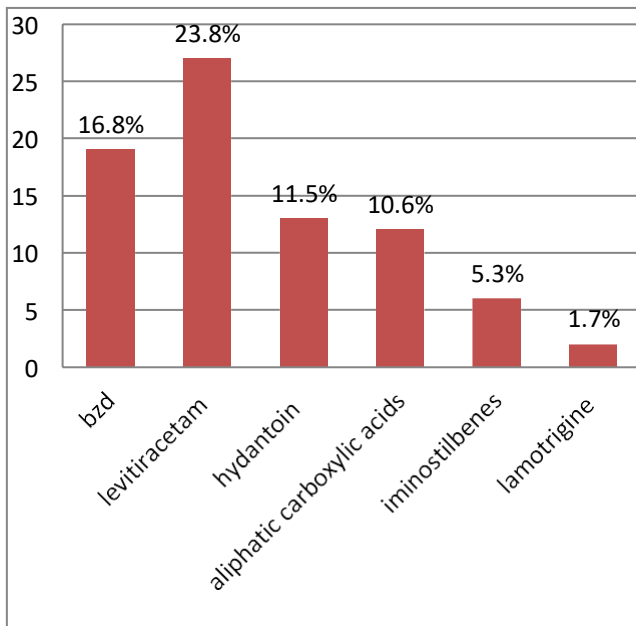
1. Average number of drugs per patient prescribed: The total number of drugs prescribed among 96 patients, was 249 of which AED's were 113 which accounts an average number of 2 drugs per patient.
2. Percentage of drugs prescribed by generic name: The total number of drugs prescribed were 249, among which 56 drugs were prescribed by generic name which accounts 22.4% and 193 drugs were prescribed by brand name which accounts 77.5% as shown in figure 1.
3. Percentage of encounters with an antibiotic prescribed: The number of antibiotics prescribed among 96 prescriptions were 3 which accounts for 3.1%.
4. Percentage of encounters with an injection prescribed: The total number of prescriptions were 96, among which with injection were 2 that accounts 2.08%.
5. Percentage of medicine from Essential drug list prescribed: The total number of drugs prescribed from NLEM of India were 42 and they account for 16.8%.

**Table 1:** Age and gender wise distribution of patients

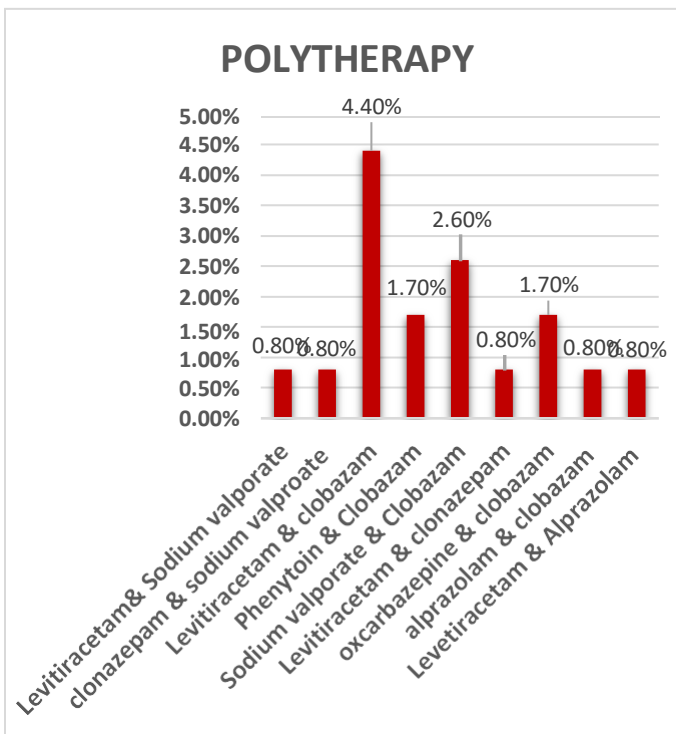
AGE	MALE	FEMALE	TOTAL
15-25 YEARS	6	16	22
25-40 YEARS	20	17	37
>40 YEARS	20	17	37
TOTAL	46	50	96



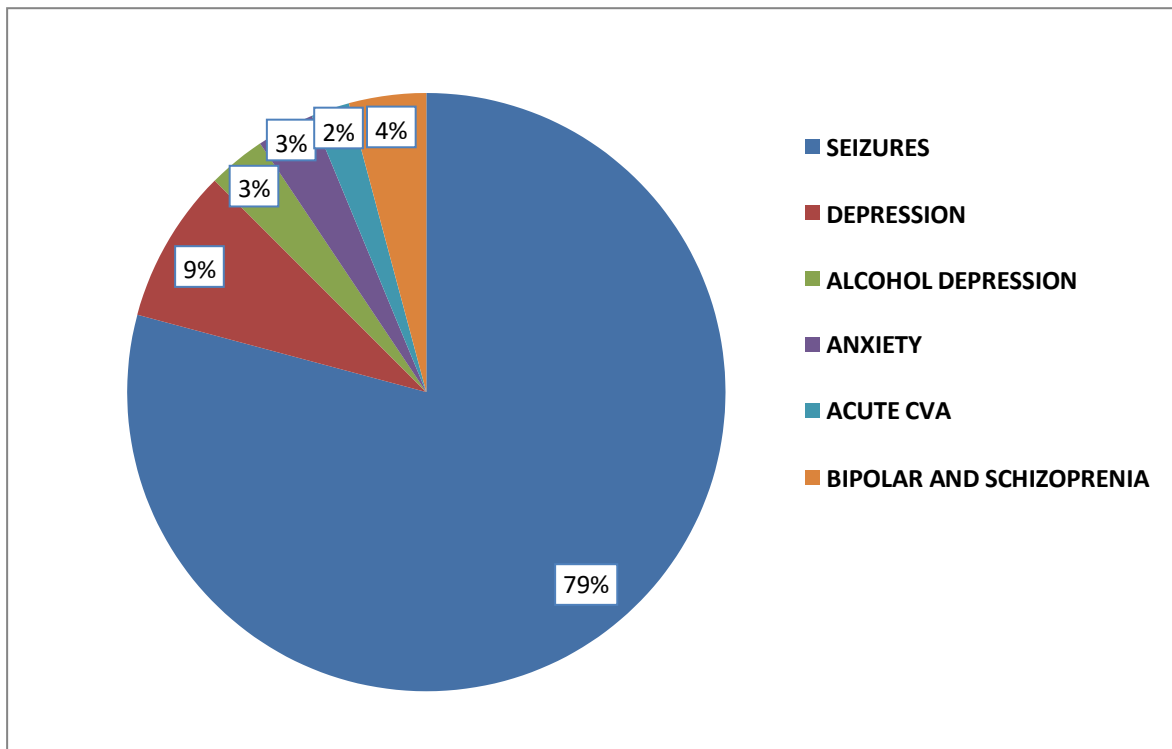
**Figure 1:** Percentage of drugs prescribed by generic name



**Figure 2:** Percentage of antiepileptic drugs as Monotherapy



**Figure 3:** Percentage of antiepileptic drugs as Polytherapy



**Figure 4:** Antiepileptic drug utilization in various disorders

**DISCUSSION:**

Common neurological disorder that requires a long-term management is epilepsy. This medical condition imposes a large burden on the patients as well as on the health-care system. Drug prescription and utilization patterns of antiepileptic drugs are often considered inappropriate and the need for registration of these reports is essential to improve the prescribing standards of antiepileptic drugs.

In our study, the number of patients receiving antiepileptic drugs were more in female (52%) than male (48%). This is not so in the studies done by Gayathri et al and Venkateswaramurthy et al.<sup>[8-10]</sup>

Literatures were compared for the age groups involved in consuming antiepileptic medications, in the present study majority belonged to 25 to 40 years and more than 40 years, whereas in other studies they were between 18 and 30 years with a mean age of 31.83 years.<sup>[11]</sup>

Monotherapy were prescribed among 69.9% of patients and 30.08% of patients received polytherapy in the present study. A study by Mane et al, had results of 38.4% of patients were prescribed monotherapy and remaining were prescribed polytherapy.<sup>[12]</sup> According to the Indian guidelines on epilepsy, treatment should be initiated with one AED's without changing the formulation of brand. If the patient does not respond to monotherapy, then the antiepileptic can be changed and the dose of the drug can be slowly build up till the seizure controlled is achieved. Combination therapy should be considered after two

attempts at monotherapy had failed.<sup>[13]</sup> This shows that adherence to standard guidelines were practised among the physicians.

In our study, levetiracetam (23.8%) was the most prescribed drug followed by benzodiazepines (16.8%), hydantoin drugs such as phenytoin, fosphenytoin (11.5%), valproic acid(10.6%) and iminostilbenes such as carbamazepine and oxcarbazepine(5.3%). However in other studies older drugs such as sodium valproate and phenytoin were more preferred.<sup>[14,15]</sup> This change in prescribing pattern might be due to the awareness among clinicians on the latest and newer epileptic drugs with lesser side effects. Preference of newer generation antiepileptic drugs like levetiracetam is the need for patients suffering from chronic illness like epilepsy for better patient compliance.

In our study, the AEDs prescribed for seizure disorder were 79%, followed by depression 8.3%, bipolar and schizophrenia 4.1%, alcohol dependence 3.1%, anxiety 3.1% and acute CVA 2.08%. Such similar utilization patterns were observed in the other studies also.<sup>[15]</sup> Lack of clinical experience, evidences in various disorders such as migraine and psychosis limits the use of antiepileptic drugs.

On comparing the WHO prescription indicators of this study with that of the reference standards - the average number of drugs per patient, encounters with antibiotics and encounters with antibiotics were as per the standards. But there were drastic differences on the parameters like prescription containing generic name, only 22.4% of drugs were prescribed by generic names. Awareness and sensitization

workshops among clinicians regarding the WHO prescription indicators should be done in regular manner for a better patient safety. Furthermore, studies in drug utilisation pattern are needed to use the newer antiepileptic drugs in a fruitful manner.

## CONCLUSION:

Our study was able to give an insight to the changes observed in the prescribing trends and utilization pattern of anti-epileptic drugs. A paradigm shift from the usage of older & conventional antiepileptic drugs which dominated the pharmacotherapy of epilepsy, to the newer Antiepileptic drugs were noted. Levetiracetam topped among the list of drugs used in prescriptions. As more than 50% of drugs were newer, it would increase a marked change in hospital formulary and ensure availability of newer drugs in the hospital pharmacy. This would definitely attenuate the compliance and economic burden of patients on management with antiepileptic drugs. Documenting the prescription trends and utilization pattern will be helpful for the healthcare professionals to make recommendations and clinical decisions to achieve optimal therapeutic effect in patients on antiepileptic drugs.

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## CONFLICTS OF INTEREST: Nil

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