

**Drug Utilization Pattern in Patients Reported with Epilepsy: Retrospective Observational Study**Veena Kumari<sup>1</sup>, Insha E Rab<sup>2</sup>, Asha Kumari<sup>3</sup><sup>1</sup>Associate Professor, Department of Pharmacology, Darbhanga Medical College, Darbhanga, Bihar, India<sup>2</sup>Senior Resident, Department of Pharmacology, Darbhanga Medical College, Darbhanga, Bihar, India<sup>3</sup>Assistant Professor and HOD, Department of Pharmacology, Darbhanga Medical College, Darbhanga, Bihar, India

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Conflict of interest: Nil

**Abstract****Aim:** The objective was to evaluate the prescription pattern of Antiepileptic drugs and to evaluate how rational is the prescription for various epilepsies.**Methods:** The present study was conducted in the Department of Pharmacology, Darbhanga Medical College, Laheriasarai Darbhanga. Adult outpatients who have been diagnosed to have epilepsy were identified and prescribing pattern was studied. Totally 100 prescriptions were collected randomly over a period of 6 months. Patients demographic details, clinical diagnosis, type of epilepsy, type of AED used, drug dose and frequency were recorded. Average number of drugs per prescriptions was calculated. Prescription of all patients was entered in a preformed proforma and was analyzed using descriptive statistics.**Results:** In the present study, out of 100 patients 60 patients were male and 40 patients were females. Epilepsy was more commonly seen in the patients of age group of 20-40 years. The analysis of the type of seizure showed that the most common type was partial seizures (64%) and the least common type was absence seizures (3%). Regarding the mode of therapy, majority of the patients were treated with monotherapy (82%). Polytherapy was given for 18% of the study population. The analysis of prescriptions showed that the most commonly prescribed drug was carbamazepine (36%) followed by valproate (24%) and levetiracetam (23%). The other drugs prescribed were phenytoin (5%), phenobarbitone (6%), benzodiazepines (4%). The least commonly prescribed drugs were the newer drugs like topiramate and lamotrigine (2%).**Conclusion:** Older antiepileptic agents like carbamazepine, valproate, phenytoin are still the most commonly agents as monotherapy whereas newer ones like levetiracetam are mostly used as add on drug in cases of treatment failure with older drugs. Antiepileptic prescribing in this study population is in accordance to the standard treatment guidelines for epilepsy.**Keywords:** Epilepsy, Anti-Epileptic Drug (AED), Monotherapy, Combined therapy (polytherapy), Prescribing pattern.

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**Introduction**

Epilepsy is a chronic neurological disease characterized by recurrent unprovoked seizure affecting roughly 50 million worldwide, of which 80% reside in developing countries. [1] Approximately 10 million people with epilepsy live in India but many patients with active epilepsy do not receive suitable treatment for their condition, leading to a large treatment gap. [2] The etiology of seizure is multifactorial, including a genetic predisposition for certain seizures, previous head trauma, stroke, brain tumors, alcohol or drug withdrawal, and other conditions. It is proposed to be an interaction between genetically determined seizures thresholds, underlying predisposing

pathologies or metabolic derangements, and acute precipitating factors. [3] The overall aim of epilepsy treatment is complete control of seizures, with no adverse reaction due to medication along with an optimal quality of life for which most patient depend on treatment with antiepileptic drugs (AEDs). [4] A variety of drugs are currently available for the treatment of epilepsy. The cost of therapy is lower in older/conventional drugs such as phenytoin, carbamazepine, valproate, and phenobarbitone; hence, they are commonly used as first-line drugs. Drugs such as levetiracetam, gabapentin, lamotrigine, vigabatrin, topiramate, lacosamide, and

zonisamide are the newer ones and currently used as alternative or add-on therapy. [5]

Prescription pattern monitoring studies are a tool for assessing the prescribing pattern of medicines and they help in promoting appropriate use of drugs and thus reduce misuse of drugs. This study is to assess the standards of medical treatment for epilepsy at tertiary level of health care. [6] Antiepileptic drugs (AEDs) are the mainstay of treatment of epilepsy and are prescribed to patients of all ages worldwide mostly as monotherapy. The prescribing pattern of Antiepileptic drugs has changed over the last decade with the development of newer drugs which have improved safety, tolerability and patient acceptability. [7,8] In a study conducted by Thasni et al, they concluded that newer AEDs were commonly used as compared to Conventional AEDs and the most commonly used AED was Levetiracetam. [9] In another study conducted by Eswari et al, it was concluded that conventional drugs like Phenytoin is a commonly prescribed drug to treat seizures followed by Sodium valproate. [10] Successful therapy is superior in patients with newly diagnosed epilepsy, and the success rate depends on type of seizure, family history, and extent of associated neurological abnormalities. However, currently available AEDs do not completely control seizure activity in some patients and these drugs also frequently produce adverse effects that range in severity from minimal impairment of the central nervous system to death from aplastic anemia or hepatic failure. [11]

The objective was to evaluate the prescription pattern of Antiepileptic drugs in department of Pharmacology, Darbhanga Medical College and

Hospital, Darbhanga, Bihar, India and to evaluate how rational is the prescription for various epilepsies.

### Methods

Place of study : present study was conducted in the Department of Pharmacology, Darbhanga Medical College, Laheriasarai, Darbhanga, Bihar, India

Study participants: Adult outpatients who have been diagnosed to have epilepsy were identified and prescribing pattern was studied.

Sample size: Totally 100 prescriptions were collected randomly over a period of 6 months. Patients demographic details, clinical diagnosis, type of epilepsy, type of AED used, drug dose and frequency were recorded. Average number of drugs per prescriptions was calculated. Prescription of all patients was entered in a preformed proforma and was analyzed using descriptive statistics.

### Inclusion Criteria

1. More than 15 years of age.
2. Both sex, male and female.
3. Idiopathic epilepsy.

### Exclusion Criteria

1. Pregnant and lactating woman

### Statistical Analysis

An observational study was done. A descriptive statistical analysis was applied in the present study.

### Results

**Table 1: Age and Sex wise distribution**

Age	Male	Female	Total N (%)
16-20 years	12	8	20 (20)
20-40 years	25	20	45 (45)
>40 years	23	12	35 (35)
Total	60	40	100(100)

In the present study, out of 100 patients 60 patients were male and 40 patients were females. Epilepsy was more commonly seen in the patients of age group of 20-40 years.

**Table 2: Type of seizure distribution in the study population**

Type of seizures	N	%
Partial seizure	64	64
GTCS	15	15
Febrile	8	8
PGE	6	6
Myoclonic	4	4
Absence	3	3
<b>Total</b>	<b>100</b>	<b>100</b>

The analysis of the type of seizure showed that the most common type was partial seizures (64%) and the least common type was absence seizures (3%).

**Table 3: Mode of therapy**

Mode of therapy	N	%
Monotherapy	82	82
Polytherapy	18	18

Regarding the mode of therapy, majority of the patients were treated with monotherapy (82%). Polytherapy was given for 18% of the study population.

**Table 4: Individual drugs prescribed**

Individual drugs	N	%
Carbamazepine	36	36
Valproate	24	24
Levetiracetam	23	23
Phenytoin	5	5
Phenobarbitone	6	6
Benzodiazepines	4	4
Newer drugs	2	2

The analysis of prescriptions showed that the most commonly prescribed drug was carbamazepine (36%) followed by valproate (24%) and levetiracetam (23%). The other drugs prescribed were phenytoin (5%), phenobarbitone (6%), benzodiazepines (4%). The least commonly prescribed drugs were the newer drugs like topiramate and lamotrigine (2%).

**Table 5: Common drugs prescribed for GTCS and partial seizures**

Common drugs	GTCS %	Partial seizures %
Valproate	46.66	6.66
Carbamazepine	13.34	40
Levetiracetam	6.66	31.66

The most commonly prescribed drug for GTCS was valproate (46.66%), followed by carbamazepine (13.34%) and levetiracetam (6.66%). In partial seizures, carbamazepine was the most common drug prescribed (40%), followed by levetiracetam (31.66%) and Valproate (6.66%).

### Discussion

The availability of numerous antiepileptic drugs (AEDs) have drastically improved the seizure control in patients with epilepsy. Nevertheless, further innovative research is required to substantiate the outward enhancement in tolerability presented by various newer AEDs. [12] The documentation of the most and least commonly used AEDs can be obtained from the studies involving epidemiological data analysis. The least frequently used AEDs include the drugs which freshly entered the market that have restricted acquaintance to patients or older drugs which were substituted by more efficacious and tolerable AEDs. Prescription pattern studies play a key role in helping the healthcare system to understand, interpret and improve the prescription, administration and use of medications, whose principal aim is to facilitate rational use of drugs. Patient files and computer registries are widely used as instruments for collecting information on drug. [13] Epilepsy is a chronic condition which impairs quality of life due to physical, psychological and socioeconomic consequences. The prime requirements are a complete diagnosis, selection of optimal treatment, and counselling appropriate to individual needs. [14]

In the present study, out of 100 patients 60 patients were male and 40 patients were females. Epilepsy was more commonly seen in the patients of age group of 20-40 years. Male preponderance is seen in gender distribution in our study, which is similar to reports from other studies in countries of Asia. [15] Maximum patients in this study were of age group 20-40 years (45%) followed by >40 years (35%) and 16-20 years (20%). Bimodal distribution is seen with the incidence of epilepsy. With a peak incidence in first decade and then in elderly patients. [16] In India, most of the population is young, which might be the reason for missing peak in elderly patients in our study. [17] The analysis of the type of seizure showed that the most common type was partial seizures (64%) and the least common type was absence seizures (3%).

Regarding the mode of therapy, majority of the patients were treated with monotherapy (82%). Polytherapy was given for 18% of the study population. The analysis of prescriptions showed that the most commonly prescribed drug was carbamazepine (36%) followed by valproate (24%) and levetiracetam (23%). The other drugs prescribed were phenytoin (5%), phenobarbitone (6%), benzodiazepines (4%). The least commonly prescribed drugs were the newer drugs like topiramate and lamotrigine (2%). The most commonly prescribed drug for GTCS was valproate (46.66%), followed by carbamazepine (13.34%) and levetiracetam (6.66%). In partial seizures, carbamazepine was the most common drug

prescribed (40%), followed by levetiracetam (31.66%) and Valproate (6.66%). Meta-analysis of different studies and NICE guidelines showed that carbamazepine and lamotrigine are the most suitable first line options for individuals with partial onset seizures and levetiracetam can also be considered for the same. Results also support the use of sodium valproate as the first-line drug for individuals with generalised tonic-clonic seizures and lamotrigine and levetiracetam were suitable alternatives. [18] Indian guidelines on epilepsy suggests carbamazepine, oxcarbamazepine, phenytoin, valproate and pheno-barbitone as first line agents for partial seizures and valproate, phenytoin, phenobarbitone and carbamazepine as first line drug for generalized tonic clonic seizures. [19]

### Conclusion

Our study on prescription pattern of epilepsy in a tertiary care hospital showed male preponderance with majority of the patients in age group 20-40 yrs. Epilepsy is a condition which needs prolonged treatment with antiepileptics and hence the appropriateness of therapy has a great impact on the quality of life of patients. Older antiepileptic agents like carbamazepine, valproate, phenytoin are still the most commonly agents as monotherapy whereas newer ones like levetiracetam are mostly used as add on drug in cases of treatment failure with older drugs. Antiepileptic prescribing in this study population is in accordance to the standard treatment guidelines for epilepsy. Further studies regarding the safety of these drugs in the study population can be done in future to ascertain these results.

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