

## A Hospital Based Assessment of the Prescription Pattern of Antiepileptic Drugs: An Observational Study

Krishna Kant Nirala<sup>1</sup>, Rohit Kumar Singh<sup>2</sup>

<sup>1</sup>Tutor, Department of Pharmacology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

<sup>2</sup>Associate Professor and HOD, Department of Pharmacology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India

---

Received: 11-08-2022 / Revised: 04-09-2022 / Accepted: 28-09-2022

Corresponding author: Dr. Krishna Kant Nirala

Conflict of interest: Nil

---

### Abstract

**Aim:** The objective was to evaluate the prescription pattern of Antiepileptic drugs in Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India and to evaluate how rational is the prescription for various epilepsies.

**Methods:** The present study was conducted in the Department of Pharmacology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India. Adult outpatients who have been diagnosed to have epilepsy were identified and prescribing pattern was studied. Totally 120 prescriptions were collected randomly over a period of 9 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 120 patients 70 patients were male and 50 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 (60%) and the least common type was absence seizures (3.34%).

**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, Prescribing pattern

---

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

---

### Introduction

Medicines are an integral part of the health care, and modern health care is impossible without the availability of necessary medicines. They not only save lives and promote health, but prevent epidemics and

diseases too. Accessibility to medicines is the fundamental right of every person. [1]

Pharmacoepidemiology is the study of the use and effects/side-effects of drugs in large numbers of people with the purpose of supporting the rational and

cost-effective use of drugs in the population thereby improving health outcomes. Drug utilization research is thus an essential part of Pharmacoepidemiology as it describes the extent, nature and determinants of drug exposure. Over time, the distinction between these two terms has become less sharp, and they are sometimes used interchangeably. Together, drug utilization research and pharmacoepidemiology may provide insights into many aspects of drug use and drug-prescribing. They provide much useful information on indirect data on morbidity, treatment cost of illness, therapeutic compliance, incidence of adverse reactions, effectiveness of drug consumption and choice of comparators. [2]

Epilepsy is the most common neurological disorder characterized by recurrent seizures due to abnormal excessive synchronous neuronal activity in the brain. [3,4] Epilepsy affects 0.5 to 1% of the world's population (50 million people worldwide). 1 in 26 people will develop epilepsy in their lifetime. 3 It is estimated that the overall prevalence of epilepsy in India is 5.59 – 10 per 1000. [5]

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. [6,7] This study has been undertaken to evaluate the prescription pattern of antiepileptic drugs for various type of epilepsies in Govt. Medical College, Kozhikode. 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.

[8] 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. [9]

The objective was to evaluate the prescription pattern of Antiepileptic drugs in Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India and to evaluate how rational is the prescription for various epilepsies.

### Materials and Methods

The present study was conducted in the Department of Pharmacology, Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India. Adult outpatients who have been diagnosed to have epilepsy were identified and prescribing pattern was studied.

### Inclusion Criteria

- More than 15 years of age.
- Both sex, male and female.
- Idiopathic epilepsy.

### Exclusion Criteria

- Pregnant and lactating woman

### Methodology

Totally 120 prescriptions were collected randomly over a period of 9 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.

### 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
10-20 years	15	10	25
20-40 years	25	23	53
>40 years	30	17	42
<b>Total</b>	<b>70</b>	<b>50</b>	<b>120</b>

In the present study, out of 120 patients 70 patients were male and 50 patients were females. Epilepsy was more commonly seen in the patients of age group of 20-40 years.(Table 1)

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

Type of seizures	N	%
Partial seizure	72	60
GTCS	20	16.66
Febrile	10	8.34
PGE	8	6.66
Myoclonic	6	5
Absence	4	3.34
<b>Total</b>	<b>120</b>	<b>100</b>

The analysis of the type of seizure showed that the most common type was partial seizures (60%) and the least common type was absence seizures (3.34%).

**Table 3: Mode of therapy**

Mode of therapy	N	%
Polytherapy	96	80
Monotherapy	24	20

Regarding the mode of therapy, majority of the patients were treated with monotherapy (79%). Polytherapy was given for 21% of the study population. Monotherapy was with conventional drugs carbamazepine, valproate and levetiracetam and polytherapy was given along with conventional drugs with newer drugs like levetiracetam, oxcarbazepine, lamotrigine and topiramate.

### 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.<sup>10</sup> 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. [11]

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. [12]

In this study, a total of 120 prescriptions of epilepsy were studied. By the analysis of sociodemographic data, it was found that percentage of male patients (58.34%) was

higher than percentage of female patients (41.66%). Male preponderance is seen in gender distribution in our study, which is similar to reports from other studies in countries of Asia. [13]

Maximum patients in this study were of age group 20-40 years (44.16%) followed by >40 years (35%) and 10-20 years (20.84%). Bimodal distribution is seen with the incidence of epilepsy. With a peak incidence in first decade and then in elderly patients. [14] In India, most of the population is young, which might be the reason for missing peak in elderly patients in our study. [15]

In this study, 80% were treated with monotherapy and the analysis of prescriptions showed that the most commonly prescribed drug was carbamazepine (35%) followed by valproate (25%) and levetiracetam (22%). the other drugs prescribed were phenytoin (6%), phenobarbitone (5%) and the least commonly prescribed drugs were topiramate (1%) and lamotrigine (1%). According to the present study, the most common drug prescribed for GTCS was Valproate and that for partial seizures was carbamazepine. 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. [16]

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. [17,18]

## 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.

## References

1. Kar SS, Pradhan HS, Mohanta GP. Concept of essential medicines and rational use in public health. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine. 2010 Jan;35(1):10.
2. World Health Organization. Promoting rational use of medicines: core components. World Health Organization; 2002.
3. DH Lowenstein, seizure and epilepsy. DL Kasper. Harrison's principles of internal medicine, 19th ed. New York. McGraw Hill education; p. 2542-59.
4. Fisher RS, Boas WvE, Blume W, Elger C, Genton P, Lee P et al. Epileptic Seizures and Epilepsy Definition Proposed by ILEA and IBE. *Epilepsia*. 2005;46 (4):470-2
5. De Boer HM, Mula M, Sander JW. The global burden and stigma of epilepsy. *Epilepsy & behavior*. 2008 May 1;12(4):540-6.
6. Groot MC, Schuerch M, Vries F, Hesse U, Oliva B, Gil M, et al. Antiepileptics drug use in seven

- electronic health record databases in Europe: a methodologic comparison. *Epilepsia*. 2014;55(5):666-73.
7. Stephen LJ, Brodie MJ. Antiepileptic drug monotherapy versus polytherapy: pursuing seizure freedom and tolerability in adults. *Curr Opin Neurol*. 2012;25(2):164-72.
  8. Thasni K, Abdurahiman P, Sadan SE. Assessment of prescription pattern and quality of life in patient with epilepsy: a tertiary care hospital based prospective study. *Int J Med Health Res*. 2017;3(10):106-11.
  9. Eswari PVS, Kumar PB, Lakshmi P. An observational study on prescribing pattern of antiepileptic drugs in pediatric patients at a tertiary care hospital. *World J Pharma Med Res*. 2017;3(7):223-6.
  10. Perucca E, Kwan P. Overtreatment in epilepsy. *CNS drugs*. 2005 Nov;19(11):897-908.
  11. Sachdeva PD, Patel BG. Drug utilization studies-scope and future perspectives. *Int J Pharm Bio Res*. 2010;1(1):11-7.
  12. Smith D, Chadwick D. THE MANAGEMENT OF EPILEPSY *Journal of Neurology, Neurosurgery & Psychiatry* 2001;70:ii15-ii21.
  13. Lim SH, Tan EK. Pattern of anti-epileptic drug usage in tertiary referral hospital in Singapore. *Neurological Journal of Southeast Asia*. 1997; 2(24):77-85.
  14. Caprio A, Hauser WA. Epilepsy in the developing world. *Current Neurology and Neuroscience Reports*. 2009;9 (4): 319-26.
  15. Mac TL, Tan DS, Quet F, Odermatt P, Preux PM, Tan CT. Epidemiology, etiology and clinical management of epilepsy in Asia: a systematic review. *The Lancet Neurology*. 2007;6(6):533-43.
  16. Nevitt SJ, Sudell M, Cividini S, Marson AG, Smith CT. Antiepileptic drug monotherapy for epilepsy: a network meta-analysis of individual participant data. *Cochrane Database of Systematic Reviews*. 2022(3).
  17. Roy MK, Das D. Indian guidelines on epilepsy. IAP expert committee guidelines. 2013: 528-532.
  18. Zaichick V.. The Contents of Nineteen Chemical Elements in Thyroid Malignant Nodules and Thyroid Tissue adjacent to Nodules investigated using X-Ray Fluorescence and Neutron Activation Analysis: Chemical elements in thyroid tissue adjacent to malignant nodule. *Journal of Medical Research and Health Sciences*, 2022; 5(1): 1663–1677.