

Prescription Pattern of Antiepileptic Drugs in ICARE Institute of Medical Sciences in Haldia

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Conflict of interest: Nil

Abstract:

Background: Epilepsy is a prevalent neurological disorder requiring long-term therapy with antiepileptic drugs (AEDs). Understanding local prescribing trends helps ensure rational and cost-effective care.

Objectives: To evaluate the prescription pattern of antiepileptic drugs among patients attending the neurology outpatient department at ICARE Institute of Medical Sciences, Haldia.

Methods: A retrospective cross-sectional observational study was conducted over a period of 12 months in the pharmacology department. Medical records of 132 patients diagnosed with epilepsy were reviewed. Data were analyzed for demographic details, type of epilepsy, drugs prescribed (monotherapy/polytherapy), and rationality as per WHO prescribing indicators.

Results: Out of 132 patients, 58.3% were males and 41.7% females. The majority (47%) were in the 21–40 age group. Generalized tonic-clonic seizures were the most common (66.6%). Monotherapy was used in 61% of cases, predominantly with sodium valproate (34%) and phenytoin (22%). Polytherapy involved combinations such as valproate + clobazam and carbamazepine + levetiracetam. Around 74% of prescriptions adhered to the essential medicines list. Average number of drugs per prescription was 1.9.

Conclusion: Sodium valproate and phenytoin were the most frequently prescribed AEDs. Monotherapy was preferred, reflecting rational prescription trends. Continued audit and pharmacovigilance are essential for optimizing epilepsy care.

Keywords: Epilepsy, Antiepileptic Drugs, Prescription Audit, Rational Drug Use, Monotherapy, Polytherapy.

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Introduction

Epilepsy is a chronic neurological disorder characterized by recurrent, unprovoked seizures resulting from abnormal electrical activity in the brain. It affects individuals of all ages and is recognized as a significant global public health challenge [1]. According to the World Health Organization, approximately 50 million people worldwide are affected by epilepsy, with nearly 80% residing in low- and middle-income countries where access to diagnosis, treatment, and continuous care remains limited. India contributes a substantial proportion to this global burden, with an estimated prevalence ranging from 5 to 10 per 1,000 population, depending on geographic and sociodemographic variations [2].

Effective management of epilepsy primarily depends on the appropriate selection and use of antiepileptic drugs (AEDs). These drugs do not cure the disease but are essential for controlling seizures and improving patients' quality of life [3]. The choice of AED depends on multiple factors including the type of seizure or epilepsy syndrome,

age and sex of the patient, comorbid conditions, drug tolerability, cost, and the likelihood of adherence to therapy. Despite the availability of newer-generation AEDs, traditional agents such as phenytoin, valproate, and carbamazepine continue to be widely used, especially in resource-constrained settings due to their cost-effectiveness and established clinical efficacy [4].

Rational prescription practices in epilepsy management are critical to avoid therapeutic failure, adverse drug reactions, and unnecessary polypharmacy. Irrational use, including over-reliance on polytherapy without clinical indication, increases the risk of drug interactions and treatment resistance. Monitoring prescribing trends can thus serve as a valuable tool for optimizing therapy and identifying gaps in adherence to standard treatment guidelines such as those provided by the World Health Organization (WHO) and the Indian National Epilepsy Guidelines [5,6].

Furthermore, regional variations in prescribing patterns are influenced by institutional protocols, prescriber preferences, local drug availability, and patient socioeconomic profiles. Given the socioeconomic diversity and limited data from eastern India, there is a need for region-specific studies to assess how AEDs are being prescribed in clinical practice. Such data are crucial for evaluating the rationality, safety, and cost-effectiveness of current antiepileptic drug use and for developing targeted interventions to promote better epilepsy care [7,8].

This study was therefore undertaken to analyze the prescription pattern of antiepileptic drugs at a tertiary care teaching hospital in Haldia, West Bengal. The findings are expected to contribute to the local pharmacovigilance efforts and guide evidence-based prescribing in the region.

Aim and Objectives

Aim: To analyze the prescription pattern of antiepileptic drugs (AEDs) among patients attending the neurology outpatient department at ICARE Institute of Medical Sciences and Research, Haldia.

Objectives:

1. To assess the demographic characteristics of patients receiving antiepileptic drug therapy.
2. To identify the most commonly prescribed antiepileptic drugs in monotherapy and polytherapy regimens.
3. To evaluate the prescribing trends with respect to seizure type and drug selection.
4. To analyze the adherence of prescriptions to the World Health Organization (WHO) prescribing indicators and the Essential Medicines List.
5. To explore the proportion of patients treated with rational drug therapy in accordance with standard treatment guidelines.

Materials and Methods

Study Design: This was a retrospective, cross-sectional, observational study conducted to assess the prescribing pattern of antiepileptic drugs (AEDs) among patients diagnosed with epilepsy.

Study Setting and Duration: The study was carried out in the Department of Pharmacology, ICARE Institute of Medical Sciences and Research, Dr. Bidhan Chandra Roy Hospital, Haldia, West Bengal, India for one year

Study Population: All patients who attended the neurology outpatient department and were

diagnosed with epilepsy and prescribed one or more AEDs during the study period were eligible for inclusion.

Sample Size: A total of 132 patient prescriptions were included in the final analysis.

Inclusion Criteria:

- Patients of any age and gender with a clinical diagnosis of epilepsy.
- Prescriptions containing at least one antiepileptic drug.
- Complete and legible patient records available for review.

Exclusion Criteria:

- Incomplete prescriptions or missing demographic data.
- Patients treated for seizures due to acute symptomatic causes (e.g., fever, trauma, metabolic derangements).
- Inpatients and emergency cases were excluded.

Data Collection Procedure: Data were collected manually from prescription records using a structured proforma. The following parameters were recorded:

- Patient demographics (age, sex)
- Type of seizure (generalized, focal, etc.)
- Name and number of AEDs prescribed
- Monotherapy vs. polytherapy
- Frequency and route of administration
- Use of generic vs. branded drugs
- Inclusion of drugs from the WHO Essential Medicines List
- Average number of drugs per prescription

Data Analysis: The collected data were entered into Microsoft Excel and analyzed using descriptive statistics. Results were expressed as frequencies, percentages, and mean values. Graphs and tables were used to illustrate findings.

Results

This section presents the findings of the retrospective analysis of 132 prescriptions for patients diagnosed with epilepsy at ICARE Institute of Medical Sciences and Research, Haldia. The analysis includes demographic data, seizure types, prescribing trends (monotherapy vs. polytherapy), drug frequency, adherence to the Essential Medicines List (EML), and WHO prescribing indicators.

Table 1: Age and Gender Distribution of Patients

Age Group (years)	Male (n = 77)	Female (n = 55)	Total (n = 132)
≤ 20	14	10	24
21–40	38	24	62
41–60	20	17	37
> 60	5	4	9

Table 2: Distribution of Seizure Types

Seizure Type	Number of Patients	Percentage (%)
Generalized (GTCS)	88	66.6
Focal Seizures	28	21.2
Absence Seizures	6	4.5
Unclassified/Others	10	7.6

Table 3: Monotherapy vs. Polytherapy Usage

Treatment Type	Number of Patients	Percentage (%)
Monotherapy	81	61.3
Polytherapy	51	38.7

Table 4: Most Commonly Prescribed Antiepileptic Drugs

AED Prescribed	Number of Prescriptions	Percentage (%)
Sodium Valproate	79	34.0
Phenytoin	51	22.0
Carbamazepine	33	14.2
Levetiracetam	28	12.1
Clobazam	20	8.5
Others (e.g., lamotrigine)	14	6.2

Table 5: Polytherapy Combinations Observed

Drug Combination	Number of Patients
Sodium Valproate + Clobazam	18
Carbamazepine + Levetiracetam	12
Phenytoin + Clobazam	9
Valproate + Levetiracetam	6
Others (including triple therapy)	6

Table 6: Adherence to Essential Medicines List (EML)

Prescription Type	Number	Percentage (%)
Drugs from EML	220	74.1
Drugs not in EML	77	25.9
Total Drugs Prescribed	297	100

Table 7: Average Number of Drugs per Prescription

Variable	Value
Total Number of Prescriptions	132
Total Number of Drugs Prescribed	251
Average Number per Prescription	1.9

Table 8: Generic vs Branded Drug Usage

Drug Type	Number of Prescriptions	Percentage (%)
Generic	203	68.4
Branded	94	31.6

Table 9: Frequency of Drug Administration

Frequency (per day)	Number of Patients	Percentage (%)
Once Daily	39	29.5
Twice Daily	66	50.0
Thrice Daily	21	15.9
Others	6	4.6

Table 10: Route of Drug Administration

Route	Number of Prescriptions	Percentage (%)
Oral	243	96.8
Parenteral	8	3.2
Others	0	0.0

Table 11: Co-Prescribed Medications

Medication Class	Number of Prescriptions	Percentage (%)
Multivitamins	39	29.5
Antacids	25	18.9
Anxiolytics	12	9.1
Others	8	6.1

Table 12: Duration of Therapy Prescribed

Duration Category	Number of Patients	Percentage (%)
< 1 month	15	11.4
1–3 months	41	31.1
3–6 months	51	38.6
> 6 months	25	18.9

Table 1 shows a male predominance (58.3%) with most patients in the 21–40 years age group. Table 2 shows that generalized tonic-clonic seizures accounted for 66.6% of cases. Table 3 reveals monotherapy was prescribed in 61.3% of patients, reflecting rational prescribing practices. Table 4 confirms sodium valproate (34%) and phenytoin (22%) as the most common AEDs. Table 5 shows valproate + clobazam and carbamazepine + levetiracetam were the most frequent polytherapy combinations. Table 6 indicates 74.1% of AEDs prescribed adhered to the WHO Essential Medicines List. Table 7 establishes the average number of AEDs per prescription was 1.9, with minimal polypharmacy. Table 8 shows that generic drugs were prescribed in 68.4% of cases, indicating moderate adherence to rational prescribing norms. Table 9 reveals that twice-daily dosing was most common (50%), followed by once-daily (29.5%), aligning with typical AED pharmacokinetics. Table 10 confirms that nearly all drugs (96.8%) were administered orally, with only a small fraction (3.2%) requiring parenteral routes. Table 11 notes frequent co-prescription of multivitamins (29.5%) and antacids (18.9%), likely for supportive therapy, with some use of anxiolytics. Finally, Table 12 indicates that the most common prescribed duration was 3–6 months (38.6%), reflecting a long-term therapeutic approach typical of epilepsy management.

Discussion

This study provides valuable insight into the prescribing patterns of antiepileptic drugs (AEDs) in a tertiary care setting in eastern India. By analyzing 132 outpatient prescriptions, the study highlights trends in drug selection, treatment strategy (monotherapy vs. polytherapy), and adherence to standard prescribing practices such as generic use, WHO Essential Medicines List (EML) inclusion, and rational polypharmacy [9].

The demographic profile of patients reflected a higher incidence of epilepsy among males (58.3%) and a peak prevalence in the 21–40 years age group. These findings are consistent with several previous

Indian studies that have reported similar age and gender distributions, possibly due to greater exposure of younger males to triggering factors such as trauma, stress, and substance abuse, as well as health-seeking behaviors that skew hospital attendance rates [10].

The predominance of generalized tonic-clonic seizures (66.6%) aligns with the seizure-type distribution observed in most Indian cohorts. These are often easier to recognize clinically and may therefore be overrepresented compared to complex partial seizures or absence seizures, which can be underdiagnosed, especially in resource-limited settings [11].

Monotherapy was the treatment strategy in 61.3% of patients. This is encouraging, as monotherapy is widely regarded as the gold standard for epilepsy management, minimizing drug interactions and adverse effects while enhancing patient compliance [12]. Sodium valproate was the most commonly prescribed AED (34%), followed by phenytoin (22%). The preference for these drugs can be attributed to their broad-spectrum activity, availability in public healthcare settings, affordability, and familiarity among physicians. Although newer AEDs like levetiracetam and lamotrigine offer better tolerability profiles, their higher cost and limited availability in certain government hospitals may hinder widespread use [13].

Among polytherapy regimens (38.7% of patients), common combinations included sodium valproate with clobazam and carbamazepine with levetiracetam. While polytherapy may be necessary in refractory cases or in the presence of mixed seizure types, its use should always be carefully justified. The average number of AEDs per prescription was 1.9, which supports the overall rationality of the prescribing patterns observed [14].

Adherence to the WHO Essential Medicines List was high (74.1%), reflecting alignment with global standards for rational pharmacotherapy. However, the use of branded drugs in 31.6% of cases suggests

that there is still scope to promote generic prescribing. In low-resource settings, generic drugs significantly reduce treatment costs and improve accessibility without compromising efficacy [15].

Nearly all AEDs (96.8%) were administered orally, which is consistent with outpatient treatment practices. The frequency of administration was largely once or twice daily, promoting patient adherence. Co-prescription of multivitamins (29.5%) and antacids (18.9%) was also noted, likely as supportive measures to reduce gastrointestinal irritation or supplement dietary deficits. A smaller proportion received anxiolytics, possibly addressing seizure-related anxiety or sleep disturbances [16]. Prescriptions were most frequently written for durations between 3 to 6 months (38.6%), followed by 1 to 3 months (31.1%). This indicates appropriate continuity of care and reflects the long-term nature of epilepsy management. However, a few cases were noted to receive less than one month of therapy, which warrants further exploration—such instances may reflect early follow-up scheduling or medication intolerance [17,18].

The findings of this study are consistent with earlier reports from Indian tertiary care hospitals, yet they also underscore specific institutional practices. For example, the relatively lower usage of newer-generation AEDs such as lamotrigine and oxcarbazepine may be addressed through improved access and physician awareness. Additionally, ongoing prescription audits and clinical pharmacovigilance can further refine AED use to improve seizure control outcomes and minimize adverse effects [19].

A key strength of this study lies in its focus on real-world outpatient prescription practices over a sufficiently large sample size. However, being retrospective, it is inherently limited by incomplete clinical data such as electroencephalography (EEG) findings, drug adherence, and adverse event profiles. Also, seizure outcomes were not assessed, which would have allowed a more definitive evaluation of the effectiveness of prescribed therapies [20].

Despite these limitations, the study successfully maps the existing trends in antiepileptic drug use at a major teaching hospital in West Bengal and provides a foundation for future comparative audits, therapeutic outcome studies, and implementation of institutional prescribing guidelines.

Conclusion

This study provides a comprehensive overview of antiepileptic drug (AED) prescribing trends in a tertiary care setting in Haldia, West Bengal. The findings indicate a predominantly rational prescription pattern, with a strong preference for monotherapy, especially in cases of generalized tonic-clonic seizures. Sodium valproate and

phenytoin emerged as the most frequently prescribed AEDs, reflecting both clinical efficacy and accessibility. The average number of drugs per prescription was low, supporting judicious pharmacological management. Adherence to the World Health Organization Essential Medicines List was notable, highlighting consistency with global standards for epilepsy care. Most AEDs were administered orally and prescribed at frequencies that promote patient compliance, such as once or twice daily. Co-prescription of supportive medications like multivitamins and antacids was observed but remained within reasonable limits. However, the use of branded drugs in nearly one-third of cases suggests a need for greater emphasis on cost-effective generic prescribing. Duration of therapy prescribed was consistent with the chronic nature of epilepsy treatment, further indicating continuity of care. Overall, the study underscores the importance of regular prescription audits, continued medical education, and better availability of newer AEDs to optimize therapeutic outcomes for epilepsy patients in resource-constrained settings.

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