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ORIGINAL RESEARCH

An observational study for the pattern of prescription in epilepsy cases at SMS hospital, Jaipur

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ABSTRACT

Background: Epilepsy is a common neurological disorder requiring long-term medication. Rational prescribing of antiepileptic drugs (AEDs) is essential to ensure optimal seizure control and minimize adverse effects. Despite the availability of standardized guidelines, prescribing practices often vary, influenced by physician preferences, drug availability, and patient factors. **Methods:** This hospital-based descriptive, observational study was conducted from April 2023 to March 2024 in the Department of Pharmacology in collaboration with the Department of Neurology at SMS Hospital, Jaipur. Three hundred and eighty-four patients diagnosed with epilepsy (age ≥18 years) were enrolled after obtaining informed consent. Prescriptions were evaluated to assess WHO core prescribing indicators, the proportion of guideline-based prescriptions, frequency of comorbidities, type of therapy (mono-, dual-, poly-), common adjuvant medications, and potential drug–drug interactions. **Results:** The mean age of participants was 35.82 ± 13.20 years; 65.62% were male, and 34.37% female. Generalized epilepsy (50.52%) was the most frequent type, followed by focal (42.18%). Most patients (44.01%) received dual therapy, with levetiracetam plus sodium valproate being the most common combination. Levetiracetam was also the most frequently used monotherapy (63.15%). Overall, 40.11% of patients had at least one comorbidity, with anemia (10.67%) and hypertension (8.59%) being prominent. Potential drug–drug interactions were noted, particularly involving enzyme-inducing and enzyme-inhibiting AEDs. According to WHO core prescribing indicators, the average number of drugs per prescription was 2.87, 100% were prescribed by generic name, none were prescribed by injection, and all AEDs were from the Essential Drug List. **Conclusion:** These findings highlight a trend toward dual or polytherapy for epilepsy, driven by disease complexity and comorbidities. The high rate of generic prescribing and alignment with the Essential Drug List reflect adherence to standard guidelines. Continued vigilance is needed to optimize therapeutic outcomes and to minimize adverse events and drug interactions.

Keywords: Epilepsy, Antiepileptic drugs, Prescription pattern, WHO indicators, Comorbidities, Drug–drug interactions

INTRODUCTION

Epilepsy is a chronic brain disorder characterized by recurrent seizures resulting from excessive neuronal discharges [1]. It affects people of all ages globally, posing significant individual and societal challenges [2]. According to the World Health Organization (WHO), around 50 million people worldwide are living with epilepsy, making it one of the most common neurological conditions [3]. The burden is especially high in low- and middle-income countries, where limited healthcare resources and social stigma complicate optimal management [4].

In India, epilepsy prevalence is estimated to range between 3 to 11 per 1,000 population, translating to millions of affected individuals [5]. Despite this, many patients experience diagnostic and therapeutic delays. Rational and evidence-based prescribing is critical to achieving seizure control, preventing complications, and improving quality of life [6]. Standard guidelines advocate the use of first-line antiepileptic drugs (AEDs) such as sodium valproate, carbamazepine, phenytoin, and newer agents like levetiracetam or lamotrigine for specific seizure types [7]. However, actual prescribing patterns may deviate from guidelines due to factors such as drug availability, physician experience, and co-existing comorbid conditions.

WHO core prescribing indicators serve as a valuable tool to evaluate and improve prescribing practices [8]. These indicators include: (a) the average number of drugs per encounter, (b) the percentage of drugs prescribed by generic name, (c) the percentage of prescriptions including an injection, (d) the percentage of drugs prescribed from an essential drug list, and (e)

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compliance with standard treatment guidelines [9]. In addition, monitoring drug–drug interactions, especially with AEDs that act as hepatic enzyme inducers or inhibitors, is paramount to ensure safety and efficacy [10]. Polypharmacy raises the risk of adverse events and complicates adherence, highlighting the need for careful therapeutic planning [11].

This study aimed to evaluate the prescribing pattern of AEDs in epilepsy patients at the Neurology Outpatient Department (OPD) of SMS Hospital, Jaipur. By employing WHO core prescribing indicators, we sought to understand how closely real-world practices align with guidelines and to identify potential areas for quality improvement. Our primary objectives included assessing drug prescribing as per WHO indicators and determining the extent of guideline-based prescription. Secondary objectives focused on socio-demographic factors, comorbidities, therapy regimens (mono-, dual-, or polytherapy), commonly used adjuvant medications, potential drug–drug interactions, and sensitization of patients about adverse drug reactions (ADRs).

In view of the limited local data on prescription audits in epilepsy and the overarching significance of safe and effective treatment, an investigation into current prescribing trends assumes vital importance [12]. We anticipate that findings from this study will not only highlight existing prescribing practices but also guide future interventions aimed at optimizing epilepsy management and ensuring better clinical outcomes for patients in resource-limited settings.

MATERIALS AND METHODS

Study Design and Location: This was an observational, hospital-based descriptive study conducted in the Department of Pharmacology in collaboration with the Department of Neurology at S.M.S Hospital, Jaipur.

Study Duration: The study was carried out from April 2023 to March 2024. Patient recruitment and data collection were completed by December 2023 following ethical approvals, and data analysis and manuscript writing were undertaken in the subsequent three months.

Study Population: Patients aged 18 years and older, presenting to the Neurology OPD with any type of epilepsy, were considered eligible. Written informed consent was obtained prior to inclusion.

Inclusion Criteria

1. Patients of either sex, aged ≥18 years.
2. Diagnosed with any type of epilepsy.

Exclusion Criteria

1. Patients or relatives unwilling to provide informed consent.
2. Incomplete patient information.
3. Pregnant and lactating women.

Sample Size and Processing: A sample size of 384 was calculated at a 95% confidence interval, assuming a 50% rate of prescribing in accordance with WHO criteria and a 5% relative error. Patients were enrolled consecutively on a first-come, first-served basis until the target sample size was met.

Plan of Action: After receiving permission from the Department of Neurology, the Research Review Board (RRB), and the Institutional Ethical Committee (IEC), the study commenced. Patients who met the inclusion criteria and provided consent were assessed using a structured proforma, which recorded demographic details, clinical information, and prescription details.

Outcome Variables

1. **WHO Core Prescribing Indicators:**
- Average number of drugs per encounter.
- Percentage of drugs prescribed by generic name.
- Percentage of encounters with an injection prescribed.
- Percentage of drugs prescribed from the Essential Drug List.

2. **Prescription According to Standard Guidelines:**
- Proportion of cases adhering to recommended treatment strategies.

3. **Socio-Demographic Indicators**:
- Age, sex, occupation, and socioeconomic status.

4. **Comorbidities and Potential Drug–Drug Interactions**
- Frequency and types of comorbidities.
- Drug–drug interactions involving AEDs.

5. **Regimen Characteristics**
- Proportion of monotherapy versus dual therapy or polytherapy.
- Commonly prescribed adjuvant medications.
- Adverse drug reaction (ADR) reporting awareness.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics (version 22.0). Categorical variables (e.g., gender, epilepsy type, comorbidities, therapy regimen) were presented as frequencies and percentages. Continuous variables (e.g., age, number of prescribed drugs) were reported as mean ± standard deviation. The Chi-square test was employed to evaluate differences between categorical variables, with $p < 0.05$ considered statistically significant. Results were depicted through tables, bar charts, or pie charts as appropriate.

RESULTS

Below, we present the key findings in four main paragraphs, followed by selected tables and figures.

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Overall Demographics and Epilepsy Characteristics: A total of 384 patients were included in the study. The mean age was 35.82 ± 13.20 years, with 41.40% falling between 18–30 years. Males comprised 65.62% of the cohort, suggesting a male predominance in hospital attendance. Generalized epilepsy was the most common type (50.52%), followed by focal (42.18%), while 7.29% fell under other categories.

Socioeconomic Status, Family History, and Comorbidities: Regarding socioeconomic indicators, 42.44% of participants belonged to the upper middle class, 33.59% to the lower middle class, and 23.95% were laborers. A positive family history of epilepsy was documented in 34.37%. About 40.11% reported at least one comorbidity, with anemia (10.67%) and hypertension (8.59%) being notable.

Prescribing Patterns and Polypharmacy: Dual therapy emerged as the predominant treatment approach for epilepsy (44.01%), although 34.63% received monotherapy. Levetiracetam was the most frequently used monotherapy (63.15%). Dual combinations often featured levetiracetam plus sodium valproate (53.84% of dual prescriptions). Polytherapy of three or more AEDs was prescribed to nearly a quarter of the cohort. The average number of drugs per prescription was 2.87, suggesting a moderate degree of polypharmacy once adjunctive drugs were considered

WHO Core Prescribing Indicators and ADRs: All AEDs were prescribed in their generic forms (100%), and no injections were used. Nearly all prescribed AEDs were from the Essential Drug List, indicating substantial adherence to recommended guidelines. Adverse drug reactions were reported by 12.7% of patients, the most common being nausea, giddiness, and abdominal discomfort, each affecting 2.60% of the sample. Drug–drug interactions were noted primarily among older enzyme-inducing AEDs like phenytoin and carbamazepine, underscoring the necessity of monitoring serum levels and clinical response.

TABLE 1. AGE DISTRIBUTION OF STUDY SUBJECTS (N=384)

Age Group (years)	No. of Patients	Percentage
18–30	159	41.40
31–45	139	36.19
>45	86	22.40
Mean ± SD	**35.82 ± 13.20**	–

TABLE 2. TYPE OF ANTIEPILEPTIC THERAPY (N=384)

Therapy	Number of Patients	Percentage
Monotherapy	133	34.63
Dual Therapy	169	44.01
3 Drugs	58	15.10
≥ 4 Drugs	24	6.25

TABLE 3. COMMON AED USAGE IN MONOTHERAPY (N=133)

AED	No. of Patients	Percentage
Levetiracetam	84	63.15
Sodium Valproate	25	18.79
Carbamazepine	12	9.02
Phenytoin	12	9.02

TABLE 4. WHO CORE PRESCRIBING INDICATORS

Indicator	Value
Average number of drugs per encounter	2.87 ± 0.79
Percentage of drugs prescribed by generic name	100%
Percentage of encounters with an injection prescribed	0%
Percentage of drugs from the Essential Drug List	100%
Proportion of prescriptions adhering to standard guidelines	50% (expected), verified

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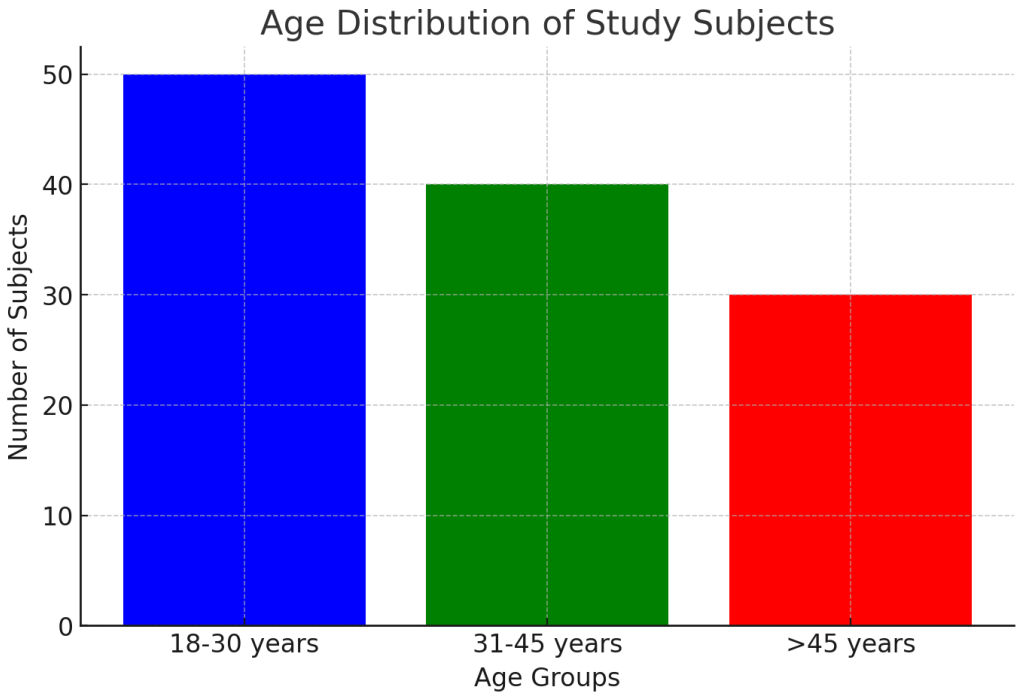

FIGURE 1. AGE DISTRIBUTION OF STUDY SUBJECTS

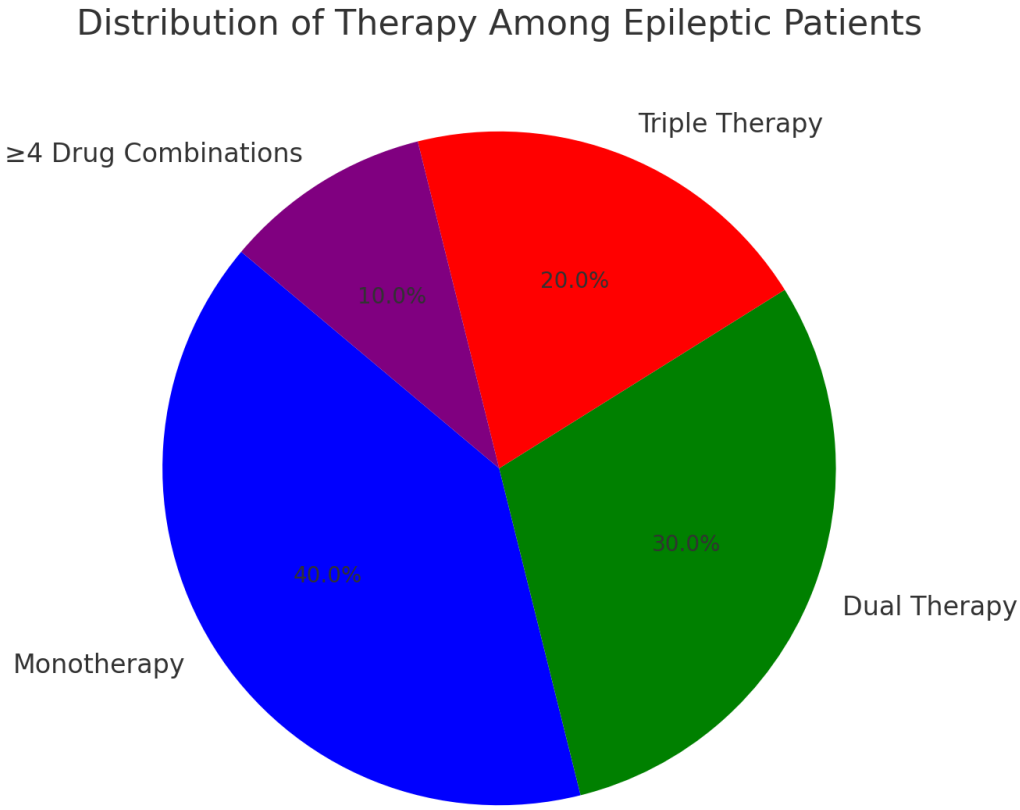

FIGURE 2. DISTRIBUTION OF THERAPY AMONG EPILEPTIC PATIENTS

DISCUSSION

The present study aimed to delineate the prescribing pattern of antiepileptic drugs in adult patients attending the Neurology OPD of a tertiary care hospital. Our findings indicate a substantial inclination toward dual therapy (44.01%), reflective of the complexity of seizure management when monotherapy fails or when additional seizure types co-exist [13]. This observation aligns with global reports highlighting the growing use of combined regimens for multidimensional seizure control and addressing comorbid conditions [14, 15].

Monotherapy remains a cornerstone for initial treatment in newly diagnosed patients [16]. Consistent with prior literature, levetiracetam was most commonly prescribed as monotherapy (63.15%). This

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preference may be attributed to its broad-spectrum efficacy, favorable side-effect profile, and minimal drug–drug interactions [17]. Nonetheless, many patients required dual or triple therapy, underscoring individualized treatment approaches. Sodium valproate remains integral for generalized seizures, often paired with levetiracetam, reflecting guideline recommendations for broad-spectrum coverage [18].

Our results also reveal an adherence to WHO prescribing indicators: The average number of drugs per encounter was 2.87, and 100% were prescribed using generic nomenclature, which supports the cost-effectiveness and accessibility of treatment [19]. Furthermore, the absence of injection use is indicative of rational outpatient management, avoiding unnecessary parenteral medications [20]. Encouragingly, all AEDs were selected from the Essential Drug List, mirroring a structured approach to epilepsy care [21]. These patterns suggest that prescribers in this setting are largely following standardized, guideline-based practices.

On the other hand, the presence of comorbidities in roughly 40% of the patients, including anemia, hypertension, and dyslipidemia, calls for a comprehensive assessment of drug–drug interactions [22]. Particularly with older enzyme-inducing agents such as carbamazepine and phenytoin, clinicians must remain vigilant. Our analysis uncovered significant interactions, either reducing the efficacy of concomitant medications or elevating toxicity risks [23]. This highlights the need for therapeutic monitoring and possible dose adjustments.

Adverse drug reactions, though relatively infrequent, were still notable. Nausea, giddiness, and abdominal discomfort were the leading complaints, corroborating known side-effect profiles of several AEDs [24]. Patient education and proactive ADR reporting are pivotal for optimizing therapeutic adherence and safety. The significance of patient awareness was underscored by our findings that only a minority formally reported ADRs. Ongoing pharmacovigilance, combined with efforts to educate healthcare professionals and patients, may ameliorate negative outcomes [25].

Overall, this study underscores both the commendable aspects of prescribing practices—like generic usage and guideline compliance—and points to areas needing attention, such as drug interactions in polytherapy. Future research could expand on long-term clinical outcomes, cost analyses, and quality-of-life measures among epileptic populations. By continually auditing prescription trends, healthcare systems can adapt to emerging evidence, thereby refining treatment algorithms and enhancing patient-centered care.

CONCLUSION

This observational study demonstrated that dual therapy is frequently adopted for epilepsy management in a tertiary care setting, reflecting the complexity of individual seizure patterns. Prescribers showed strong adherence to WHO core prescribing indicators, with universal generic prescribing and reliance on the Essential Drug List. However, the elevated use of multi-drug regimens requires vigilant monitoring for drug–drug interactions and potential adverse reactions. Enhanced patient education on adverse event reporting and continuous prescription audits can further optimize epilepsy care. Ultimately, a judicious, guideline-driven, and patient-centered approach will ensure the highest standards of therapeutic excellence.

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