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RESEARCH ARTICLE

Prescription Patterns and Clinical use of Antiepileptic Drugs in a Tertiary Care ICU in Western India: A Prospective Cross-Sectional Study

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ABSTRACT

Background: Epilepsy is a major chronic neurological disorder that requires long-term treatment with antiepileptic drugs (AEDs), and inappropriate prescribing can worsen outcomes, increase adverse effects, and add to healthcare costs. Monitoring real-world AED utilization in tertiary-care settings is essential to promote rational pharmacotherapy and align practice with national and international guidelines.

Objective: To evaluate the prescribing patterns of AEDs in a tertiary-care hospital, with emphasis on the use of newer versus conventional agents, the proportion of monotherapy and polytherapy, and the influence of documented comorbidities on prescribing trends.

Methods: A prospective, observational, cross-sectional prescription audit was conducted over six months in a tertiary-care hospital in Latur, Maharashtra, India.All prescriptions containing at least one AED for patients managed for epilepsy or seizure disorders during the study period were included.An anonymized, structured proforma was used to record indication, AEDs prescribed (name, route, regimen), number of AEDs per prescription (monotherapy vs polytherapy), presence of major comorbidities in aggregate categories, and any adverse drug reactions documented in the medical records. Data were analysed descriptively using frequencies and percentages.

Results: Seventy-seven AED-containing prescriptions were evaluated. Monotherapy was observed in 50 prescriptions (64.9%), while 27 (35.1%) involved polytherapy with two or more AEDs. Levetiracetam was the most frequently prescribed drug, appearing in 72 prescriptions (93.51%), and constituted the core of both single-drug and combination regimens.Conventional agents were less commonly used: valproic acid in 20 prescriptions (25.97%), fosphenytoin in 9 (11.69%), and phenytoin in 7 (9.09%). No comorbidities were recorded in 49 prescriptions (72%); among those with documented comorbid conditions, hypertension (13%), type 2 diabetes mellitus (8%), and concurrent diabetes with hypertension (7%) were most frequent.Available demographic details suggested a male predominance and higher AED use in adults aged 18–40 years.

Conclusion: AED prescribing in this tertiary-care hospital was characterized by a clear preference for monotherapy and a marked shift toward levetiracetam-based regimens, with traditional agents used less often. These patterns suggest increasing reliance on newer AEDs with favourable safety and interaction profiles, but also highlight the need for better documentation of seizure type and comorbidities, and for regular prescription audits and clinical pharmacist involvement, to ensure sustained adherence to evidence-based epilepsy treatment guidelines.

Keywords: Neurological disorder, Clinical, Prescription

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Introduction

Epilepsy is a chronic neurological disorder characterized by a persistent tendency to experience recurrent, unprovoked seizures due to abnormal, excessive electrical activity in the brain.These seizures range from brief lapses of awareness to generalized tonic–clonic episodes with loss of consciousness and convulsions, and they substantially interfere with education, employment, social functioning, and autonomy. [1]Globally, epilepsy affects an estimated 50 million people, with a disproportionate burden in low- and middle-income countries where diagnostic facilities, specialist care, and continuous access to medicines are often limited. In addition to seizure recurrence, people with epilepsy are at increased risk of trauma, burns, drowning, status epilepticus, and sudden unexpected death in epilepsy (SUDEP), while psychiatric comorbidities such as depression and anxiety are common and further impair quality of life.[2]Stigma and misconceptions such as beliefs that epilepsy is contagious or caused by supernatural forces remain widespread in many communities and contribute to delayed care, social exclusion, and under-treatment.[3]Antiepileptic drugs (AEDs) are the mainstay of epilepsy management and aim to achieve sustained seizure freedom or a clinically meaningful reduction in seizure frequency with tolerable adverse effects. [4]Conventional agents such as phenytoin, carbamazepine, phenobarbital, and valproate have been used for decades and are effective but are limited by

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narrow therapeutic indices, complex pharmacokinetics, and dose-related toxicities, including hepatic dysfunction, haematological abnormalities, teratogenicity, and cognitive or behavioural adverse effects.[5]Newer AEDs, including levetiracetam, lamotrigine, oxcarbazepine, and gabapentin, offer more favourable tolerability profiles, fewer drug–drug interactions, and, in some cases, broader efficacy across seizure types, making them attractive options in patients with comorbidities or polypharmacy. [6,7]Nevertheless, up to one-third of patients remain drug-resistant, and many more experience preventable adverse events or poor seizure control because of inappropriate drug selection, subtherapeutic dosing, polytherapy without clear indication, or inadequate monitoring.[8,9]Rational AED prescribing requires alignment of the chosen drug regimen with seizure type and epilepsy syndrome, patient age and sex, comorbidities, organ function, concomitant medications, and reproductive considerations, guided by evidence-based recommendations from the International League Against Epilepsy (ILAE), WHO, and national societies.[10,11] In routine practice, especially in tertiary-care and intensive-care settings, prescribing is influenced by acuity of presentation, availability of parenteral formulations, prescriber familiarity, and institutional protocols, and actual patterns may diverge from guideline-directed care.[12] Drug-utilization studies from different regions have documented wide variation in the relative use of conventional versus newer AEDs, the predominance of mono- versus polytherapy, and the frequency of potentially irrational combinations, highlighting the need for local audits.[13,14] In India, data on real-world AED prescribing in tertiary-care hospitals,particularly regarding the extent of levetiracetam use, patterns of polytherapy, and consideration of comorbidities,remain limited.Evaluating prescribing patterns at the institutional level is therefore essential to identify the most frequently used AEDs, quantify the balance between monotherapy and polytherapy, detect common prescription errors, and assess the extent of adherence to national and international treatment guidelines.[15,16]Such information can reveal gaps between recommended and actual practice, inform targeted educational and stewardship interventions, and ultimately contribute to safer and more effective epilepsy management in resource-constrained settings.[17-19] The present study was undertaken in a tertiary care hospital in Latur, Maharashtra, to describe contemporary AED prescribing patterns, including the use of newer versus conventional agents, the distribution of mono- and polytherapy, and the influence of demographic and clinical characteristics, and to generate evidence-based recommendations to optimize rational use of AEDs in this setting.[20,21]

Methods

Study Design and Setting

This was a prospective, observational, cross-sectional drug-utilization study conducted in a tertiary care hospital in Latur, Maharashtra, India. The study focused on prescribing patterns of antiepileptic drugs (AEDs) in routine clinical practice, with particular emphasis on medicines used in the intensive care unit and other hospital departments where AEDs were routinely prescribed.

Study Period

Prescriptions and related treatment records were reviewed over six months from December 2024 to May 2025.

Study Population and Scope

The study included all prescriptions in which at least one AED was ordered for patients managed for epilepsy or seizure disorders during the study period. The unit of analysis was the prescription rather than the individual patient. No interventions were made, and no changes were introduced to existing treatment practices.

Data collection

A structured data collection form was developed to capture key elements of AED utilization from hospital prescriptions and associated case records. The following information was recorded in anonymized form: Clinical indication for

AED therapy as documented by the treating team (e.g., epilepsy, seizure prophylaxis in neurological conditions). Names of AEDs prescribed (generic and/or brand), route of administration, and dosage schedule. Number of AEDs per prescription, categorized as monotherapy (single AED) or polytherapy (two or more AEDs).The duration of AED therapy during the hospital stay was clearly recorded. Presence of documented comorbid conditions relevant to prescribing decisions (e.g., hypertension, diabetes mellitus), captured only as aggregate categories and not as individual identifiers.Any recorded adverse drug reactions or laboratory abnormalities explicitly attributed to AED therapy by the treating physicians.Data were obtained exclusively from existing hospital records: physician prescriptions, inpatient medication charts, case sheets, discharge summaries, laboratory reports, and the hospital pharmacy database. Names, registration numbers, contact details, and other personal identifiers were not collected; all data were coded before analysis to ensure anonymity.

Outcome Measures

The primary outcomes were:The frequency of use of individual AEDs (e.g., levetiracetam, valproic acid, fosphenytoin, phenytoin).The proportion of prescriptions categorized as monotherapy versus polytherapy.Secondary outcomes included:The relative utilization of newer versus conventional AEDs.The distribution of AED combinations commonly used in polytherapy.The proportion of prescriptions that appeared consistent with major guideline principles (e.g., preference for monotherapy when feasible, avoidance of clearly irrational combinations), as judged from the clinical indication and documented comorbidities. Description of documented adverse drug reactions attributed to AEDs in the records.The study was descriptive in nature and did not evaluate long-term clinical outcomes such as seizure control after discharge.

Data Management and Statistical Analysis

All extracted information was entered into a coded Microsoft Excel spreadsheet for cleaning and tabulation.Descriptive statistics were generated using. Categorical variables such as type of therapy (monotherapy vs polytherapy), AEDs used, and comorbidity categories were summarized as frequencies and percentages.Graphical representations (bar charts and pie charts) were used to illustrate AED utilization patterns, the proportion of mono- versus polytherapy, and the distribution of commonly prescribed agents.No hypothesis testing or multivariable analysis was performed. Ethical considerations:The study involved secondary analysis of routinely generated hospital prescription and treatment data, with all information recorded in an anonymized manner and no direct intervention in patient care. The participating hospital provided a no-objection certificate permitting the use of de-identified prescription data for research and publication. As part of the underlying thesis work, written informed consent for use of clinical information was obtained from patients or their legally authorized representatives at the time of hospitalization, and hospital administration granted permission (NOC) for access to records and dissemination of aggregated findings.

Results

Overall datasetDuring the six-month study period, a total of 77 AED-containing prescriptions were evaluated from patients managed for epilepsy or seizure disorders in the tertiary-care hospital.Each prescription contained at least one antiepileptic drug, and all were included in the analysis. Monotherapy versus polytherapy.Most prescriptions reflected the use of a single AED. Monotherapy was observed in 50 of 77 prescriptions (64.9%), whereas 27 prescriptions (35.1%) contained two or more AEDs and were categorized as polytherapy.This indicates a clear predominance of monotherapy, with a little over one-third of prescriptions employing combination therapy where additional seizure control or prophylaxis was considered necessary.Use of newer versus conventional AEDs.Newer AEDs clearly dominated prescribing. Levetiracetam was the most frequently used agent, appearing in 72 of 77 prescriptions (93.51%), and thus formed the backbone of both single-drug and combination regimens.Conventional agents were used less often: valproic acid was prescribed in 20 prescriptions (25.97%), fosphenytoin in 9 (11.69%), and phenytoin in 7 (9.09%). In many cases, levetiracetam was used alone in monotherapy, while in polytherapy it was commonly combined with valproic acid or fosphenytoin.

Distribution of Data Based on Gender

Based on the collected data, a significant gender disparity was observed among the study population. Out of a total of 77 patients, 60 were male, accounting for 77.92%, while only 17 were female, representing 22.08%. This clearly indicates that the prevalence of epilepsy was notably higher in males compared to females in the study sample. The reasons for this difference may be multifactorial, including genetic, hormonal, environmental, or lifestyle-related factors. This gender-based distribution highlights the need for further investigation into the underlying causes of such disparity and may also influence future approaches in diagnosis, treatment, and management strategies.

Table 1: Distribution of data based on gender

Gender	*No. of patients*	*% Distribution of data*
Male	60	77.92%
Female	17	22.08%
Total	77	100%

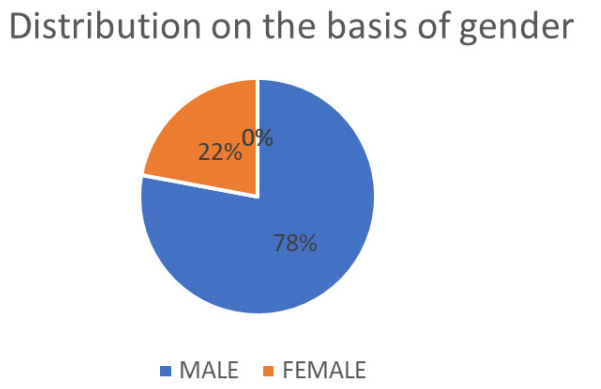

Figure 1: Distribution of data based on gender

Distribution of Data Based on Age

Based on our observations and data analysis, the highest number of patients was found in the 18–40 years age group, accounting for 27 patients, which represents 35.06% of the total study population. This indicates that epilepsy is more commonly reported in younger adults in this dataset. The second highest distribution was observed in the 41 60 years age group with 20 patients (25.97%), followed by 16 patients (20.78%) in the 61–80 years age group. Interestingly, 14 patients (18.18%) belonged to the 81–100 years age group, showing that elderly individuals also form a significant portion of the affected population. The lowest representation, contrary to the earlier statement, is not in the 20–29 age group alone, but in the older age brackets if looked at proportionally. Overall, the data suggest that epilepsy affects individuals across a wide age range, with a peak in the 18–40 years group, requiring age-specific approaches in treatment and care.

Distribution of Data Based on Comorbidities

Based on the analysis of the collected data, it was observed that a significant number of patients diagnosed with epilepsy also had co-existing medical conditions. Among these, the most commonly reported co-morbidities were diabetes mellitus (DM) and hypertension (HTN), present together in approximately 28% of the cases. These findings suggest a possible link between epilepsy and metabolic or cardiovascular disorders, which may influence the overall management and treatment outcomes. On the other hand, 49% of the patients were found to have no associated co-morbidities, indicating that nearly half of the study population was affected by epilepsy as an isolated condition.

Table 2: Distribution of Data based on age group

Age	*No. of patients*	*% Distribution of data*
18-40	27	35.06
41-60	20	25.97
61-80	16	20.78
81-100	14	18.18
Total	77	100

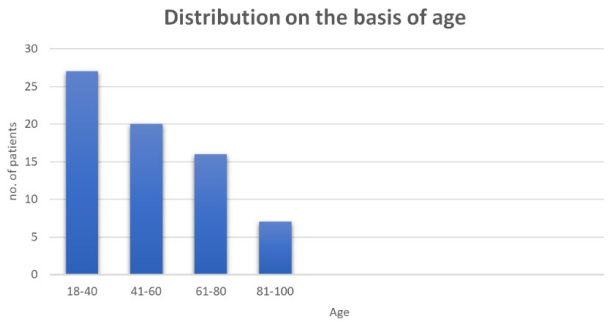

Figure 2: Distribution of Data based on age group

Table 3: Distribution of data based on comorbidities

Co-morbidities	*No. of patients*	*% Distribution of data*
HTN	9	13
DM with HTN	5	7
DM II	6	8
Without Comorbidities	49	72

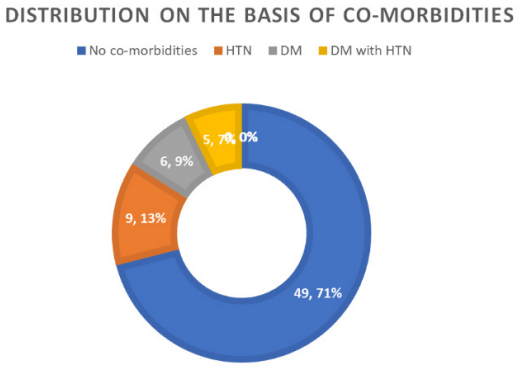

Figure 3: Distribution of data based on comorbidities

Table 4: Distribution of data based on the type of therapy used

Category (Type of therapy)	*No. of Patients*	*% Distribution of data*
Monotherapy	50	64.94
Polytherapy	27	35.6
Total	77	100%

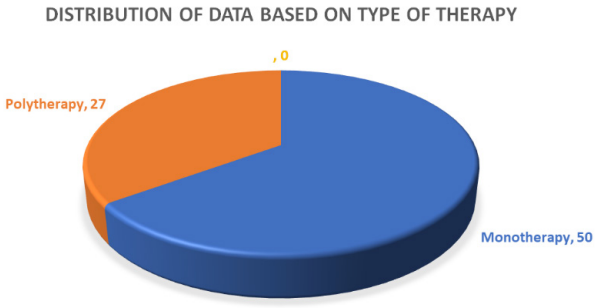

Figure 4: Distribution of data based on the type of therapy used

Table 5: Distribution of data based on the most used antiepileptic drugs

Category (Antiepileptic drugs)	*No. of patients*	*% Distribution of data*
Valproicacid	20	25.97
Fosphenytoin	9	11.69
Phenytoin	7	9.09
Levetracetam	72	93.51

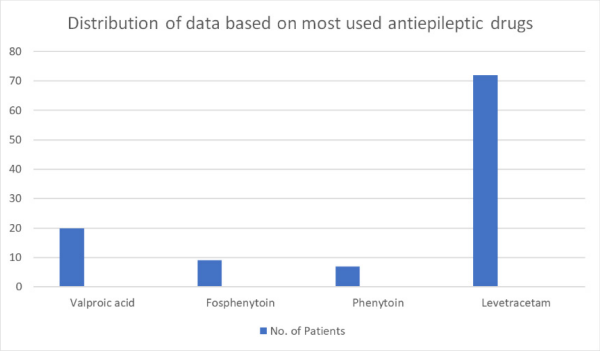

Figure 5: Distribution of data based on the most used antiepileptic drugs

Distribution of Data Based on Type of Therapy

Out of the total sample size included in the study, 50 patients (64.9%) were treated with monotherapy, while 27 patients (35.1%) received polytherapy for the management of epilepsy. This indicates that the majority of patients were managed with a single antiepileptic drug (AED), reflecting a preference for monotherapy in clinical practice, likely due to its lower risk of adverse effects, better compliance, and simplified treatment regimen. However, a notable proportion of patients required polytherapy, possibly due to inadequate seizure control with a single drug or the presence of drug-resistant epilepsy.

Distribution of Data Based on Most Used Antiepileptic Drugs

Distribution of Antiepileptic Drugs in the Study Population. In this study, a total of 77 cases were reviewed to assess the prescribing pattern of antiepileptic drugs (AEDs) in a tertiary care hospital setting. Levetiracetam was the most frequently prescribed AED, used in 72 cases (93.51%). Its dominance in prescriptions reflects its high efficacy, favourable side effect profile, minimal drug interactions, and broad-spectrum activity. Levetiracetam is often preferred in both monotherapy and adjunct therapy, particularly for partial and generalized seizures. Valproate was prescribed in 20 cases (25.97%), commonly used for generalized seizures, juvenile myoclonic epilepsy, and bipolar disorder. Despite concerns about teratogenicity, valproate remains a valuable option due to its broad-spectrum anticonvulsant properties. Fosphenytoin was used in 9 cases (11.69%), typically in acute or emergency settings due to its parenteral route and better tolerability over phenytoin. Phenytoin appeared in 7 cases (9.09%), showing a declining trend in usage due to its narrow therapeutic index, risk of long-term adverse effects, and complex pharmacokinetics.

Discussion

This study provides a concise view of current antiepileptic drug (AED) prescribing practices in a tertiary-care hospital in Latur, with three key observations: predominance of levetiracetam, preference for monotherapy, and relatively infrequent use of conventional AEDs such as phenytoin and valproate. The high proportion of monotherapy (about two-thirds of prescriptions) is consistent with guideline recommendations that favour single-drug therapy whenever feasible to improve tolerability, reduce interactions, and support adherence. The heavy reliance on levetiracetam used in more than 90% of prescriptions likely reflects its broad spectrum of activity, favourable safety profile, availability in both intravenous and oral forms, and minimal drug–drug interactions, which are particularly advantageous in acute and ICU settings.Traditional agents such as valproic acid, fosphenytoin, and phenytoin were used less frequently, suggesting a gradual shift away from drugs with

narrow therapeutic indices and higher monitoring demands towards newer AEDs that are simpler to use in busy clinical environments. Comorbidities were infrequently documented, although hypertension and diabetes were the most common when present, supporting the rationale for agents with limited metabolic and cardiovascular impact. The observed male preponderance and higher use in younger adults likely reflect local access and referral patterns rather than purely biological differences, and highlight the usual limitations of hospital-based datasets. Overall, these findings indicate a move toward more rational, simplified AED regimens but also emphasize the need for better documentation of seizure type, indication, and comorbidities, as well as regular prescription audits and clinical pharmacist involvement, to ensure that prescribing remains fully aligned with national and international epilepsy treatment guidelines.

Conclusion

This prescription-pattern study from a tertiary-care hospital in Latur shows that antiepileptic drug (AED) use is strongly oriented toward newer agents, with levetiracetam forming the core of most regimens and monotherapy being the predominant approach. Nearly two-thirds of AED-containing prescriptions employed a single drug, while about one-third used combinations, reflecting a reasonable balance between guideline-preferred monotherapy and the clinical need for polytherapy in more complex or refractory cases. Conventional agents such as valproic acid, fosphenytoin, and phenytoin were used less frequently, suggesting a gradual shift away from drugs with narrow therapeutic indices and greater monitoring demands toward options with more favourable safety and interaction profiles.The overall pattern indicates a move toward simpler, potentially safer AED regimens but also underscores the importance of systematically documenting seizure type, indication, and comorbidities to ensure that drug choice is fully aligned with evidence-based recommendations. Regular prescription audits, better recording of clinical details in routine practice, and involvement of clinical pharmacists could help refine AED selection, minimize unnecessary polytherapy, and further enhance the quality and safety of epilepsy and seizure management in similar tertiary-care settings.

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Conflict of Interest

The authors declare that there are no conflicts of interest related to this study, its analysis, or its publication.

Authors' Contribution

Miss Waghmare Swapnali Rama, Mr. Kasle Ujjwal Shrikant, and Mr. Shaikh Affan Usman jointly conceived the study concept and objectives and developed the study protocol under faculty supervision. They were responsible for data extraction from hospital records, preparation of the database, and initial descriptive analysis of prescribing patterns. All authors contributed to the interpretation of findings, drafting and critical revision of the manuscript, approved the final version for submission, and agree to be accountable for all aspects of the work.

Conceptualization, study design, methodology, data collection, data curation, statistical analysis,visualization, manuscript writing, and preparation of the original draft: Waghmare Swapnali Rama, Mr. Kasle Ujjwal Shrikant, and Mr. Shaikh Affan Usman

Formal analysis, Academic supervision, critical review, intellectual input, and guidance throughout the research process: Dr. Shafi Sameer, Fugate Ajay R., Dharashive Vishweshwar M.

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References

1. Chen, Z., Brodie, M. J., Liew, D., & Kwan, P. Treatment Outcomes in Patients With Newly Diagnosed Epilepsy Treated With Established and New Antiepileptic Drugs: A 30-Year Longitudinal Cohort Study. *JAMA Neurology*, 2018;75(3): 279–286.
2. Löscher, W., Potschka, H., Sisodiya, S. M., & Vezzani, A. Drug Resistance in Epilepsy: Clinical Impact, Potential Mechanisms, and New Innovative Treatment Options. *Pharmacological reviews*, 2020;72(3): 606–638.
3. Perucca, P., Scheffer, I. E., & Kiley, M. The management of epilepsy in children and adults. *The Medical journal of*

Australia, 2018;208(5):226–233.

4. Thijs, R. D., Surges, R., O'Brien, T. J., & Sander, J. W. Epilepsy in adults. *Lancet (London, England)*, 2019;*393*(10172):689–701.
5. Perucca, E., Brodie, M. J., Kwan, P., & Tomson, T. 30 years of second-generation antiseizure medications: impact and future perspectives. *The Lancet. Neurology*, 2020;19(6): 544–556.
6. Chen, Z., Brodie, M. J., Liew, D., & Kwan, P. Treatment Outcomes in Patients With Newly Diagnosed Epilepsy Treated With Established and New Antiepileptic Drugs: A 30-Year Longitudinal Cohort Study. *JAMA Neurology*, 2018;*75*(3): 279–286.
7. Mbizvo, G. K., Dixon, P., Hutton, J. L., & Marson, A. G. Levetiracetam add-on for drug-resistant focal epilepsy: an updated Cochrane Review. *The Cochrane database of systematic reviews*, 2012(9): CD001901.
8. Abou-Khalil B. Levetiracetam in the treatment of epilepsy. *Neuropsychiatric disease and treatment*, 2008;4(3):507–523.
9. Trinka, E., Cock, H., Hesdorffer, D., Rossetti, A. O., Scheffer, I. E., Shinnar, S., Shorvon, S., & Lowenstein, D. H. (2015). A definition and classification of status epilepticus--Report of the ILAE Task Force on Classification of Status Epilepticus. *Epilepsia*, 2015;56(10): 1515–1523.
10. Kapur, J., Elm, J., Chamberlain, J. M., Barsan, W., Cloyd, J., Lowenstein, D., Shinnar, S., Conwit, R., Meinzer, C., Cock, H., Fountain, N., Connor, J. T., Silbergleit, R., & NETT and PECARN Investigators. Randomized Trial of Three Anticonvulsant Medications for Status Epilepticus. *The New England journal of medicine*, 2019;381(22): 2103–2113.
11. Yang, M., Zhang, Y., Zhang, T., Zhou, H., Ren, J., Cao, X., Zhou, D., & Yang, T. Postoperative seizure outcomes and antiseizure medication utilization based on histopathological diagnosis: A retrospective cohort study. *Epilepsy & behavior: E&B*, 2024;*161*:110056.
12. Rayman, G., Akpan, A., Cowie, M., Evans, R., Patel, M., Posporelis, S., & Walsh, K. Managing patients with comorbidities: future models of care. *Future healthcare journal*, 2022;*9*(2), 101–105.
13. Singh, G., & Sander, J. W. The global burden of epilepsy report: Implications for low- and middle-income countries. *Epilepsy & behavior: E&B*, 2020;105: 106949.
14. Beghi E. The Epidemiology of Epilepsy. *Neuroepidemiology*, 2020;54(2): 185–191.
15. Yasiry, Z., & Shorvon, S. D. The relative effectiveness of five antiepileptic drugs in the treatment of benzodiazepine-resistant convulsive status epilepticus: a meta-analysis of published studies. *Seizure*, 2014;23(3): 167–174.
16. Löscher, W., & Klein, P. The Pharmacology and Clinical Efficacy of Antiseizure Medications: From Bromide Salts to Cenobamate and Beyond. *CNS drugs*, 2021;35(9), 935–963.
17. Tomson, T., Battino, D., & Perucca, E. Valproic acid after five decades of use in epilepsy: time to reconsider the indications of a time-honoured drug. The Lancet. Neurology, 2016;15(2):210–218.
18. Glauser, T., Shinnar, S., Gloss, D., Alldredge, B., Arya, R., Bainbridge, J., Bare, M., Bleck, T., Dodson, W. E., Garrity, L., Jagoda, A., Lowenstein, D., Pellock, J., Riviello, J., Sloan, E., & Treiman, D. M. Evidence-Based Guideline: Treatment of Convulsive Status Epilepticus in Children and Adults: Report of the Guideline Committee of the American Epilepsy Society. Epilepsy currents, 2016;16(1):48–61.
19. Scheffer, I. E., Berkovic, S., Capovilla, G., Connolly, M. B., French, J., Guilhoto, L., Hirsch, E., Jain, S., Mathern, G. W., Moshé, S. L., Nordli, D. R., Perucca, E., Tomson, T., Wiebe, S., Zhang, Y. H., & Zuberi, S. M. ILAE classification of the epilepsies: Position paper of the ILAE Commission for Classification and Terminology. Epilepsia, 2017;58(4): 512–521.
20. Patsalos P. N. Clinical pharmacokinetics of levetiracetam. Clinical pharmacokinetics, 2004;43(11):707–724.
21. Cock, H. R., & ESETT Group. Established status epilepticus treatment trial (ESETT). Epilepsia, 2011;52 Suppl 8: 50–52.
22. French, J. A., & Perucca, E. Time to Start Calling Things by Their Own Names? The Case for Antiseizure Medicines. Epilepsy currents, 2020;20(2): 69–72.
23. WHO Model List of Essential Medicines, 23rd List. 2023. Geneva: World Health Organization.