TREATMENT PROTOCOL AND RECOVERY RATE FOR EPILEPTIC PATIENTS IN TERTIARY CARE HOSPITAL

V.V. Rajesham*[1], R. Lavanya[2], K. Nikitha[2], S. Shanmukha Rao[2] & T. Rama Rao[3]

[*1] Department of Pharmacology, CMR College of Pharmacy, Medchal, Hyderabad-500020.
[2]Department of Pharm. D, CMR College of Pharmacy, Medchal, Hyderabad-500020
[3]Professor & Principal, CMR College of Pharmacy, Medchal, Hyderabad-500020

Corresponding author
Dr. V. Venkata Rajesham. M. Pharm., Ph.D
Associate Professor
Department of Pharmacology
CMR College of Pharmacy
Medchal
Hyderabad-501401

ABSTRACT

Introduction: Epilepsy is a common chronic non-contagious diseasemarked by recurring seizures triggered by an increase in brain electrical activity. This is caused by aberrant neuronal discharges or the hyperexcitability of synchronized neurons. It causes psychological, physical, and socioeconomic factors to impair one's quality of life. Complete diagnosis, selection of appropriate treatment, and effective counselling were the most important aspects in treating epilepsy patients.

Methodology: A 6-month prospective observational study was carried out in a tertiary carehospital. Data of (n= 112) of seizures from general medicine, pediatrics departments were collected and analysed to obtain results.

Results and discussion: Based on the study, the data of a total 112 patients (n=112) were evaluated. Out of 112 patients, 63(56.3%) were males and 49(43.7%) were females. Gender based distribution of the data shows higher prevalence rate in males. The most commonly affectedage group was observed to be 41-50 years. A total of 10 ASMs were either prescribed as monotherapy (42%) or polytherapy (58%). In monotherapy, levetiracetam (57.4%) was commonly prescribed and in polytherapy, the most commonly prescribed combination was levetiracetam+ midazolam (21.2%).

The average length of stay of patients with one or two ASM was less than that of patients with three or more ASM (4.9days < 7.6days).

Conclusion: The results of our study concluded that most of the male patients are affected with seizures than female patients. The treatments for epilepsy were beneficial with polytherapy compared to monotherapy. With polytherapy incorporating new anti-epileptic medicines, the time of hospital stay was shortened, and seizure recurrence was also reduced.

***Key words*:** Epilepsy, Anti-seizure medications, recovery rate.

INTRODUCTION

Epilepsy is a neurological disorder marked by recurring seizures triggered by an increase in brain electrical activity. This is caused by aberrant neuronal discharges or the hyperexcitability of synchronized neurons. Even a single seizure can alter brain development, resulting in behavioral and cognitive abnormalities. [1]

Epilepsy had a pooled incidence rate of 61.4 per 100,000 person-years (95 percent confidence interval: 50.7–74.4). Low/middle-income countries (LMIC) had a greater incidence than high-income countries (HIC), with 139.0 (95 percent CI 69.4–278.2) vs. 48.9 (95 percent CI 39.0–61.1). The prevalence of epilepsy varies greatly between nations, based on various variables. Epilepsy was shown to be more common in LMICs (8.75 per 1,000; 95 percent CI 7.23–10.59) than in HICs (5.18 per 1,000; 95 percent CI 3.75–7.15), with a lifetime frequency of 7.60 per 1,000 people (95 percent CI 6.17–9.38).

Epilepsy is more common in men than in women. The disparity could be explained by the varying prevalence of the most frequent risk factors in different locations, as well as the concealment of the disease in women for sociocultural reasons. In population-based studies, the incidence of relapse following a first unprovoked seizure was pretty stable, with 36–37 percent rates at 1 year and 43–45 percent rates at 2 years. [2]

The main goal in the management of epilepsy is to eliminate or reduce seizures, minimizing adverse effects, improving medical and neuropsychiatric comorbidities, and fostering a great quality of life.

Epilepsy can be caused by various reasons and the most common causes of the epilepsy vary depending on the population. Etiologies can be generally classified as Genetic, Structural, Infectious, Metabolic and immune based.

The severity of the symptoms varies based on the type of seizure. Seizures differ from one patient to the next, yet they tend to be stereotyped within an individual.

- Focal Seizures-Alterations in motor functions, sensory symptoms, loss of consciousness.
- Absence seizures-a blank stare, upward rotation of the eyes, altered consciousness.
- GTC seizures- loss of consciousness, motor symptoms, premonitory symptoms.
- Tonic - clonic seizures-tonic contraction of muscles followed by rigidity and clonic movements.
- Myoclonic jerks-brief shock-like muscular contractions of the face, trunk, and extremities.
- Atonic seizures-sudden loss of muscle tone. [3]

For the treatment of epilepsy, a variety of ASDs are available. The initial ASD should be tailored to the epileptic syndrome and seizure type, as well as the side effects profile, pharmacokinetic profile, potential interactions with other medications or medical conditions, patient age, reproductive concerns, and cost. [4]

METHODOLOGY

Study site: Gandhi Hospital.

Study design: A prospective observational study.

Study duration: 06 months.

Study period: October 2021 – March 2022.

Study approval: Study protocol was Approved by institutional ethical committee, CMR College of Pharmacy, Hyderabad and approved.
Total number of cases: 150-200.

INCLUSION CRITERIA

- Diagnosed cases of epilepsy.
- Patients attending general medicine and pediatrics department.
- Childhood seizures.
- Past history seizures/epilepsy.

EXCLUSION CRITERIA

- Drug/ vaccine induced seizure.
- Febrile seizures.
- Pregnant or lactating individuals.
- Patient diagnosed with other disease after admitting with seizures, Ex- stroke, CVST.
- Patients who are absconded.

RESULTS AND DISCUSSION

Gender wise distribution

Data of total 112 epileptic patients (n=112) has been obtained for analysis in this study.

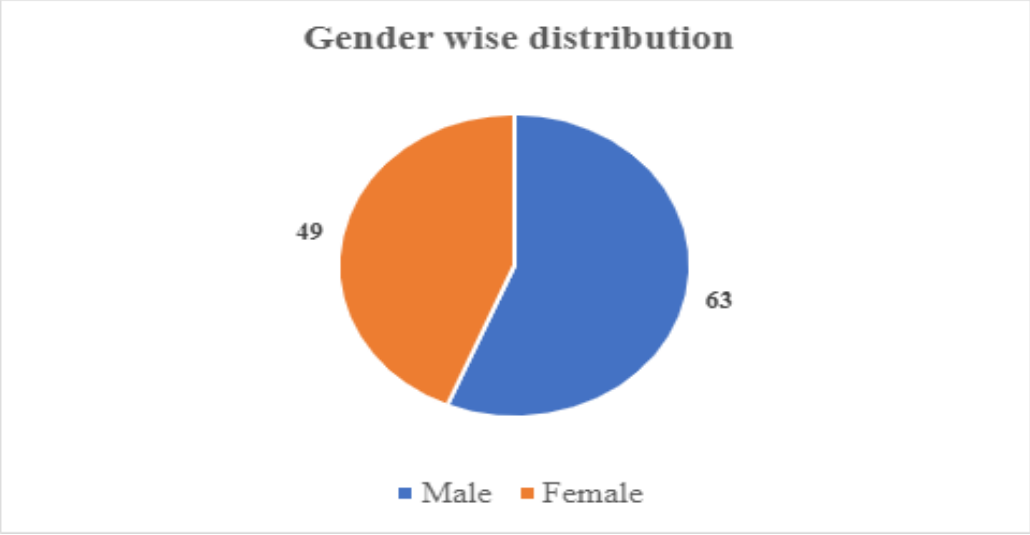

Figure 1: Gender wise distribution

The cases are distribution according to gender, out of which 63(56.25%) and 49(43.75%) are males and females respectively. Results were showed in **Figure 1**

Age wise distribution

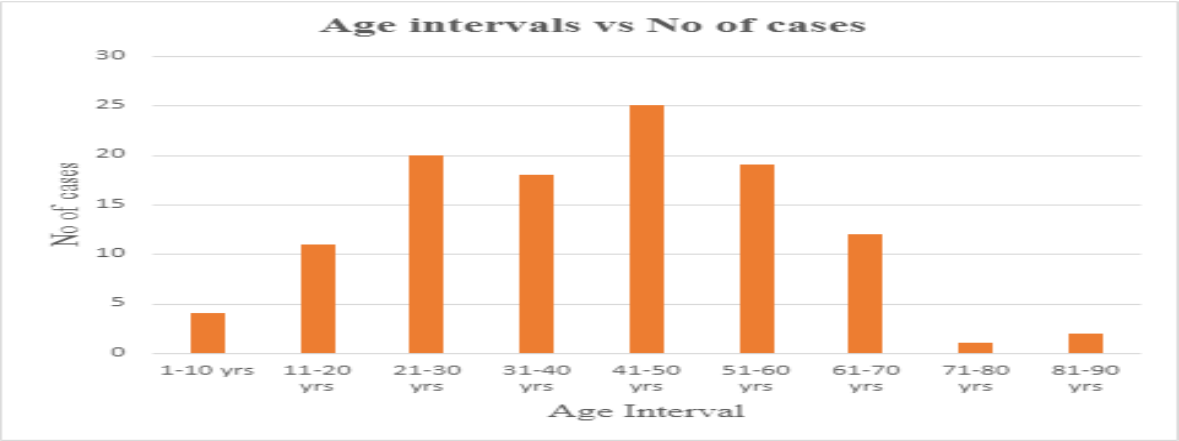

Figure 2: Age wise distribution

Cases are distributed with respect to age intervals amongst the following age group patients found more cases (41-50 (22.3%), 21-30 (17.8%), 51-60 (16.9%) and 31-40 (16%)). The results were showed in **Figure 2**

Diagnosis based distribution

Table 1: Diagnosis based distribution

Diagnosis	No of cases	Percentage (%)
Seizures	37	33.03
New onset seizures	21	18.75
Status epilepticus	10	8.9
GTCS	10	8.9
Others	10	8.9
Focal seizures	9	8
Gliotic seizures	7	6.25
Epilepsy	6	5.3
Partial seizures	2	1.78
Total	112	100

Cases were categorized based on the diagnosis and revealed that seizure 37(33.03%), new onset seizures 21(18.75%) was found more cases in over all 112 cases. Results were depicted in **Table 1.**

Treatment wise distribution

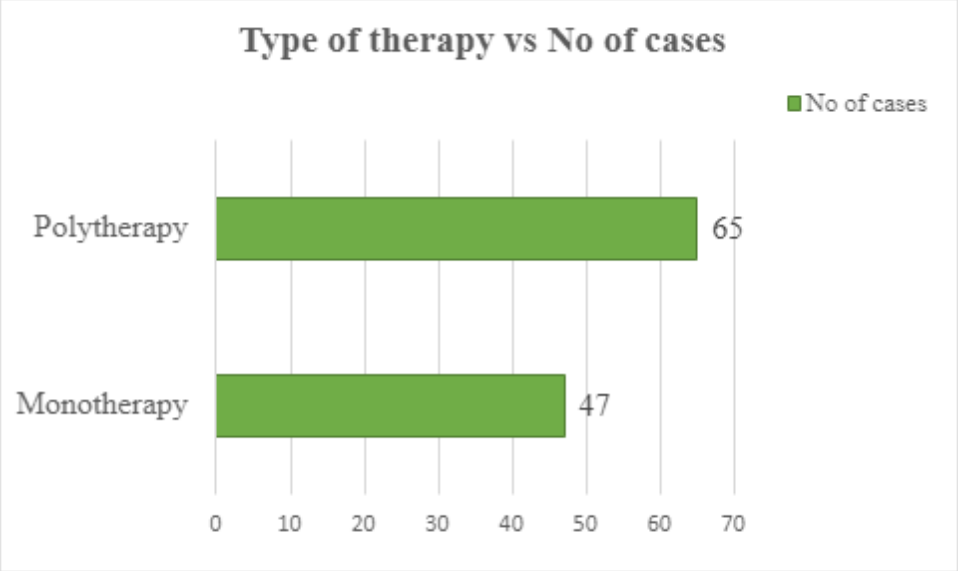

Figure 3: Therapy wise distribution

Patients were treated with both monotherapy and poly therapy in that 42% of patients received monotherapy and 65% of patients received polytherapy. The results were showed in **Figure 3**.

Table 2: Treatment wise distribution

Type of therapy	No. of cases	Percentage (%)
Monotherapy		
Levetiracetam	27	24.1
Phenytoin	13	11.6
Midazolam	4	3.5
Carbamazepine	1	0.8
Clobazam	1	0.8
Oxcarbamazepine	1	0.8
Polytherapy		
Levetiracetam+ Midazolam	14	12.5
Phenytoin+ Midazolam	6	5.3
Levetiracetam+ Phenytoin	4	3.5
Levetiracetam+ Carbamazepine	2	1.7
Sodium valproate + Levetiracetam	1	0.8
Sodium valproate+ Phenytoin	1	0.8
Sodium valproate + Midazolam	1	0.8
Midazolam+ Levetiracetam+ Phenytoin	9	8.0
Levetiracetam+ Midazolam+Sodium valproate	5	4.4
Carbamazepine+ Sodium valproate+ Midazolam	1	0.8
Levetiracetam+ Phenytoin+ Sodium valproate	1	0.8
Levetiracetam+ Lacosamide + Midazolam	1	0.8

Levetiracetam+ Midazolam+ Clobazam	1	0.8
Levetiracetam+ Sodium valproate+ Carbamazepine	1	0.8
Levetiracetam+ Midazolam+ Lorazepam	1	0.8
Sodium valproate+ Carbamazepine+ Phenytoin+Midazolam	1	0.8
Phenytoin+ Sodium valproate +Lorazepam +Levetiracetam	1	0.8
Phenytoin+ Oxcarbamazepine + Clobazam+Midazolam	1	0.8
Lacosamide + Lorazepam + Midazolam+ Sodium valproate	1	0.8
Carbamazepine+ Levetiracetam+ Midazolam+Phenytoin	1	0.8
Clobazam + Sodium valproate+ Carbamazepine	1	0.8
Levetiracetam+ Sodium valproate+ Midazolam + Phenytoin	1	0.8
Levetiracetam+ Midazolam +Sodium valproate + Oxcarbamazepine	1	0.8
Levetiracetam+ Phenytoin+ Phenobarbitone + Lorazepam	1	0.8
Phenytoin+ Levetiracetam+ Clobazam+ Carbamazepine	1	0.8
Levetiracetam+ Sodium valproate+ Lacosamide + Lorazepam	1	0.8
Midazolam+ Levetiracetam+ Sodium valproate + Clobazam	1	0.8
Levetiracetam+ Phenytoin+ Clobazam+ Sodium valproate+ Lacosamide	1	0.8
Levetiracetam+ Sodium valproate + Clobazam+ Lacosamide + Oxcarbamazepine + Clonazepam	1	0.8
Levetiracetam + Sodium valproate + Clobazam+ Lorazepam+ Carbamazepine+ Phenytoin + Perampanel	1	0.8
Total	112	100

In the treatment different drugs were used in single drug and combination. In that most of the patients received Levetiracetam 24.1% and in combination therapy Levetiracetam+ Midazolam was used 12.5 % of patients were received. The results were showed in **Table 2**.

Recovery rate based distribution

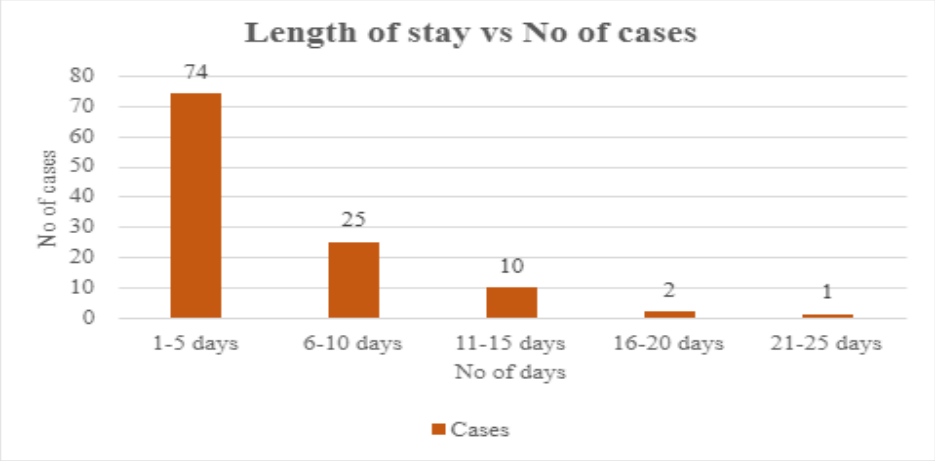

Figure 4: Length of hospital stay

The length of hospital stays among 112 patients found those 1-5 days (66%). This shows the better recovery of the patients in 1-5days. The results were showed in **Figure 4**

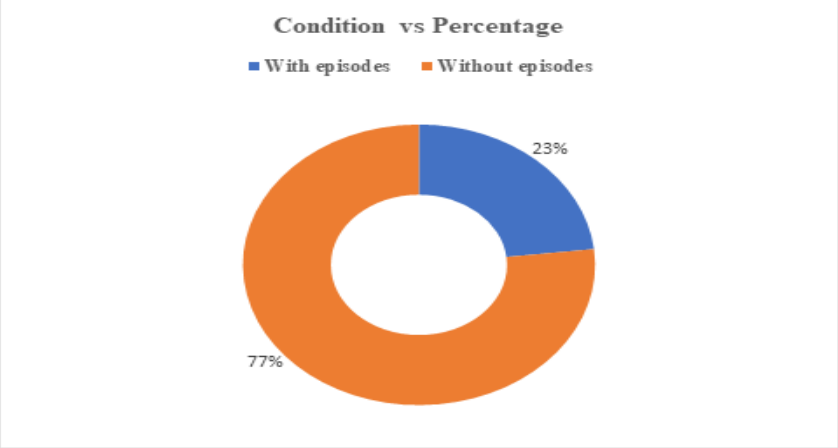

Figure 5: Length of stay- recovery rate distribution

Length of hospital stays and recovery of the patients in 1-5 days (73.2%) without episodes the patients were recovered. The results were showed in **Figure 5.**

DISCUSSION

Epilepsy is a common chronic non-contagious condition which that causes psychological, physical, and socioeconomic factors to impair one's quality of life. The primary requirement for the treatment of epilepsy patient was to complete diagnosis, selection of appropriate treatment, and proper counselling. [5]

The two most consistent predictors of seizure recurrence are a documented aetiology and an abnormal electroencephalography (EEG) pattern. Seizures can be managed with proper anti - seizure medication use, up to 70% of people with epilepsy could achieve seizure freedom. After two years without seizures, discontinuing anti-seizure medication should be considered, taking into account relevant clinical, social, and personal factors. [6]

For this study we have chosen, a total of 112 seizure patients (n =112) were analysed. It was observed that out of 112 patients 63, (56.3%) were males and 49 (43.7%) were females, implying that males are more affected than females. This is supported by studies conducted by Radhakrishnan et al. [2000] who found that males have a higher prevalence rate than females.[7] Seizures were reported to be more prevalent in the age groups between 41-50

(22.3%), 21-30 (17.8%), 51-60 (16.9%) and 31-40 (16%). This contradicts the findings of Senthil Amudhan et al. [2015]. [8]

Data obtained based on diagnosis has revealed that seizures (33.03%), new onset seizures (18.7%), GTCS, status epilepticus, and others [complex partial seizures, epilepsia partialis continua] (8.9%), focal seizures (8%), gliotic seizures (6.2%), epilepsy (5.3%), and partial seizures (1.7%). These results contradict the study conducted by Divyani Garg [2020], who found that generalized seizures account for 46% and location- specific seizures account for 56%.[9]

Monotherapy and polytherapy were used in 41.9% and 58% of cases respectively, contradicting a study conducted by N. ShilpaB et al., [2020]. A total of 10 anti- epileptic drugs were observed, out of which levetiracetam (69.6%) was mostly preferred. In monotherapy, levetiracetam (57.4%) was commonly prescribed, whereas levetiracetam + midazolam (21.2%) were commonly prescribed in polytherapy. [5]

The purpose of our study was to determine the recovery rate of epileptic patients based on the length of hospital stay. According to the study conducted by Ashwaq Alsulami et al. [2021], the average length of hospital stay of epileptic patients was found to be 3.3- 5.7 days when the length of stay ranged from 1 to 12+ days, which supports our results. [10] The majority of patient's length of stay in the hospital was determined to be between 1-5(66%). The study conducted by Deana M et al. [2016] has shown the average length of stay of patients with one or two ASM was less than that of patients with three or more ASM, which supports our results (4.9days < 7.6days). [11]The patients experiencing seizure episodes were found to be 26 (23.2%) and those without seizures were found to be 86 (76.7%), which demonstrates the effectiveness of the treatment. Amongst patients without experience of seizures, 52.3% have shown seizure freedom with monotherapy and 48.8% have shown seizure freedom with polytherapy.

CONCLUSION

Based on our study it was concluded that most of the male patients are affected with seizures than female patients. The treatment for epilepsy was beneficial with polytherapy compared to monotherapy. The length of hospital stay was reduced with polytherapy containing new anti-epileptic drugs; also found that recurrence of seizures was reduced.

BENEFIT OF STUDY

- Our study of the data analysed will provide the effectiveness of the treatment by considering the recovery rates.
- It shows the use of the new anti-seizure medications by comparing them with the older medications.
- It shows the achievement of a better patient outcome.

LIMITATIONS OF THE STUDY

- Due to the short time frame, a proper recovery rate could not be established.
- Certain factors, such as recurrent seizures, side effects, and ADRs, etc., couldn't be analysed.

- The inclusion criteria for the study were limited by excluding certain cases with HIV pregnancy due to a lack of such cases.

FUTURE SCOPE

The beneficial effect of polytherapy was observed in a shorter duration but to estimate the effect of polytherapy in longer duration further studies are to be conducted.

REFERENCES

1. Anwar H, Khan QU, Nadeem N, Pervaiz I, Ali M, Cheema FF. Epileptic seizures. Discoveries. 2020; 8(2):e110.
2. Beghi E. The Epidemiology of Epilepsy. Neuroepidemiology. 2020; 54(2):185–91.
3. Schwinghammer TL, DiPiro JT, DiPiro C, Wells BG. Pharmacotherapy Handbook, 9/E. Google Books. McGraw-Hill Education; 2014.
4. Devinsky O, Vezzani A, O'Brien TJ, Jette N, Scheffer IE, de Curtis M, et al. Epilepsy. Nature Reviews Disease Primers. 2018 May 3; 4(1).
5. N, Shilpa B. "Prescription Pattern of Anti-Epileptic Medications in a Tertiary Care Centre." *Indian Journal of Pharmacy and Pharmacology.*2018 Apr; 5 (1):7–10.
6. https://www.who.int/news-room/fact-sheets/detail/epilepsy
7. Radhakrishnan, K., et al. "Prevalence, Knowledge, Attitude, and Practice of Epilepsy in Kerala, South India." *Epilepsia.* 2000 Aug; 41(8):1027–1035.
8. Gururaj, Gopalkrishna, et al. "Epilepsy in India I: Epidemiology and Public Health." *Annals of Indian Academy of Neurology.* 2015; 18(3):263.
9. Divyani Garg. Specific considerations for epilepsy in india. Current medical issues. 2020 Apr; 18(2):105-110.
10. Ashwaq Alsulami et al. "Factors contributing to the length of stay in patients admitted to the epilepsy monitoring unit". J Neurol Neurosci. 2021 Jan; 12(1:348).
11. Deana M, Gazzola, et al. "Epilepsy Monitoring Unit Length of Stay." *Epilepsy & Behavior : E&B.* 2016 Mar; 102-105.