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Treatment Pattern of Antiepileptic Drugs in Paediatric with Epilepsy

Dwajani.S,[1]* Meghana K.S,[1] Krithika S,[1] Adarsh.E[2]

[1]Department of Pharmacology, Central Research Lab, Rajarajeswari Medical College and Hospital, Kambipura, Mysore Road, Bangalore - India
[2]Department of Pediatrics, Rajarajeswari Medical College and Hospital, Kambipura, Mysore Road, Bangalore - India

Abstract

Studying drug utilization helps to develop twin concepts for therapeutic formulation and essential drug lists. The main preference of using Antiepileptic drug (AED) therapy is that patients can be seizure-free for their lifetime. Treating children with epilepsy remains a major challenge, despite having several AEDs. Hence, we aimed to study drug utilization patterns among pediatric patients with epilepsy. This prospective study was conducted on 150 patients lesser than 18 years of age, receiving antiepileptic drugs. A specially designed case record form was used to collect the data on socioeconomic status, disease data, and treatment details. The majority of the children were females (60.6%), ages ranged from day 1 to 4 years (56.6%). About 35.33% were skilled laborers followed by 32.23% semi-skilled. Around 49.3% of patients belonged to the lower-middle-class family and 41.33% were diagnosed to have generalized tonic-clonic seizures (GTCS). The majority of the children were on monotherapy (81.33%) while 18.66% were on dual therapy or polytherapy. Regarding the usage of antiepileptic drugs, we found that 70.66% of children were on older AEDs like sodium valproate (27.33%) followed by clobazam (31.33%). Levetiracetam was the only new antiepileptic drug that was prescribed in 10% of patients. Monotherapy is considered as best modality, due to its low cost, safety profile, and lesser drug interactions. It can also improve drug treatment compliance and adherence. Along with older AEDs, there has been an increase in the utilization of newer AEDs, which help to broaden the therapeutic option towards the management of childhood epilepsy with a better safety profile.

Keywords: Epilepsy, pediatrics, rationale drug use, drug utilization, seizures, antiepileptic drugs

Corresponding author: Dwajani S. Central Research Lab, Rajarajeswari Medical College and Hospital, Kambipura, Mysore Road, Bangalore - India Email: dwajani@gmail.com
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Introduction

Epilepsy is considered to be the most common and serious neurological disorders which is more prevalent in childhood. The aim of the treatment is to treat epilepsy, with appropriate antiepileptic drugs (AEDs) which can control seizures without causing any untoward reaction due to the medication.[1]

During last two decades, several newer AEDs have been released into the market for the treatment of epilepsy. Though the use of newer AEDs has been increasing, conventional AEDs continue be in use and are still preferred because of their cost and availability. Both conventional and newer AEDs have proven in their safety and efficacy.[2] Though there has been a specific difference between the drugs, patient factors needs to be considered when choosing the AEDs.[3]

Drug utilization act as an important tool and provides a potential insight for assessing the current standards of drug prescription.[4] Information provided by such studies helps to evaluate and modify the prescribing pattern and assess if the drug is used rationally.[5] The reason for studying drug utilization is to develop a twin concept for therapeutic formulation and essential drug list.

The main preference of using AEDs therapy is patients can be seizure-free for their lifetime. But, in children with epilepsy, the outcome depends on many factors like selection of the drug, right dose, therapeutic monitoring, diagnosing the type of seizure.[6] For successful treatment management all these factors need to be taken care of. Treating children with epilepsy remains a major challenge, despite having several AEDs. Hence, we aimed to study the drug utilization pattern among pediatric patients with epilepsy.

Methods

This was prospective, observational study conducted, after obtaining ethical committee clearance at a tertiary care hospital in Bangalore, Karnataka, India. We conducted study on 150 children with epilepsy attending outpatient or inpatient department of paediatrics. The study was conducted for duration of 1 year from April 2018 to June 2019. The inclusion criteria of the study were children with confirmed cases of epilepsy, under 18 years old, and who received AEDs. We obtained consent from the parents or their legal guardians before enrolling them into the study. We excluded children with chronic kidney disease, liver disease, neurological conditions like mental retardation, global development delay, autism, etc.

Data was entered into a microsoft excel sheet, where demographic details was collected according to the modified kuppuswamy scale. Specially designed case record form was used to collect the data on socioeconomic status, disease data, and treatment details. Investigations if done were noted. All the data were entered were kept confidential.

Results and Discussion

A total of 150 patients were enrolled in the study. Majority of the children were females (60.6%). We had patients age ranging from day 1 to 17 years (Figure 1). Among 150 patients, 90% of them belonged to Hindu community. Majority of the family were from urban background (63.3%) while 36.6% were from rural background. As per the modified kuppuswamy scale, we analyzed the socioeconomic status of the children with epilepsy.(Figure 2)

On assessing family history of seizures, only 22.6% of patients' reported among near and dear family members who were on treatment / being treated or treated. With regards to the

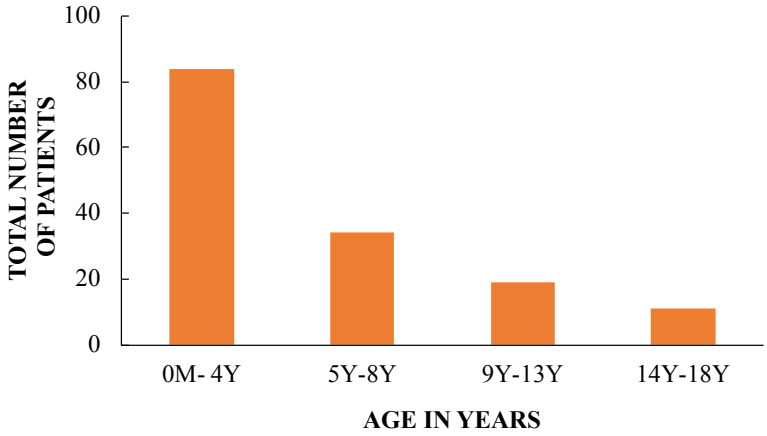

Figure 1. Age Distribution of Children with Epilepsy

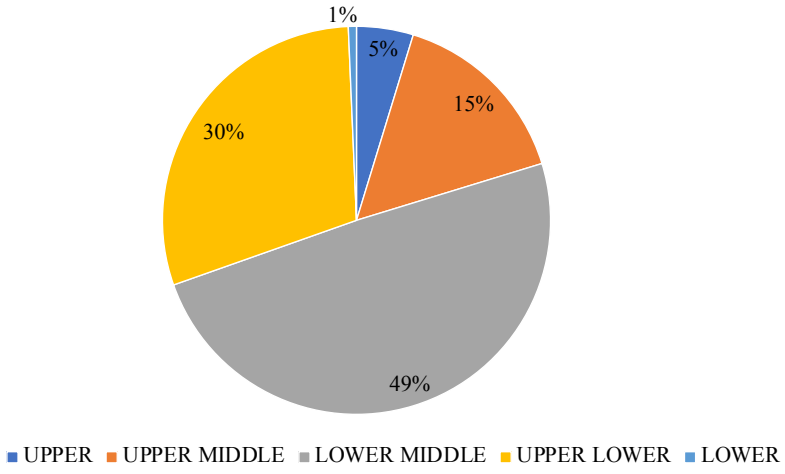

Figure 2. Socioeconomic Status of Patients with Epilepsy

treatment initiation, majority (84%) of them had started treatment with AEDs soon after their first attack i.e., within 3 months of the attack. EEG was suggested by the treating doctor to most of the patients, among which 59.3% had abnormality condition.

Epilepsy during childhood hinders education, social relationship and feeling of being worthless. Proper diagnosis and appropriate treatment with antiepileptic drugs will optimize the seizures. Though the availability of antiepileptic drugs has been increased, ≥ 30% of children tend to suffer with childhood seizures.[7] The major aim with AEDs treatment should be that, drugs shall help to minimize seizures with very minimal side effects. Such improving conditions can help the child to be an active member in the community.[8]

In this study, majority of the patients were female, which was in contrast to the study results conducted by Hassan and his colleagues,[6] while in consonance with the study carried by kousalya et al and Bhat et al, in which majority of children were between 0 to 5 years of age.[9,10] When we considered the treatment gap and looked into the data, we found that majority of the patients had initiated their treatment within 3 months of

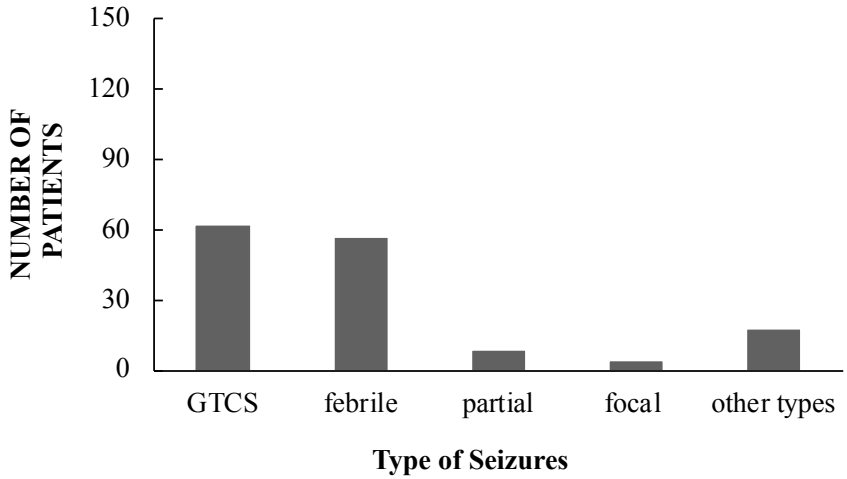

Figure 3. Type of Seizures among Paediatric Patients with Epilepsy

their attack. The possible reason for this could be the education and knowledge regarding the disease among parents of children with epilepsy, while only few of them had initiated their treatment after 3 years of their last attack, which could be due to social stigma associated with the disease or possibly due to financial constraints. Socioeconomic background of the parents plays a major role in leading a quality life among children with epilepsy.[11]

For proper diagnosis and management of epilepsy, it is important to consider the treatment guidelines by international league against epilepsy, their classification of epilepsy and epileptic syndromes. About 41.33% were diagnosed having generalized tonic clonic seizures (GTCS), 38% with febrile seizures, 9% were diagnosed with partial seizure, while 2.66% with focal and rest 8.66% had other types of seizures like absence seizures, focal seizures, neonatal seizures, hot water epilepsy and nocturnal seizures (Figure 3). Other studies conducted in Oman and India reported results similar to our study, whereas study conducted by Hassan[6] and Larsson[14] showed that focal seizures were reported majorly which was contrast to our study. This could be due to variation in the region along with genetic factors and race.

With regards to the antiepileptic treatment pattern, we noticed that majority of the children were on monotherapy (81.33%) while the rest were on dual therapy or polytherapy (18.66%). When we specifically looked in detail regarding the usage antiepileptic drugs, we found that 70.66% of children were on older AEDs like sodium valproate (27.33%) followed by clobazam (31.33%), while other drugs like phenytoin, carbamazepine and phenobarbitone were less used.

Sodium valproate as monotherapy was the most commonly drug prescribed among older AEDs. These results were similar to our previously published data.[4] One of the review article conducted by Egunsola et.al also mentioned that, sodium valproate is the most frequently prescribed antiepileptic drug among pediatrics.[5] Because of the broad spectrum activity of sodium valproate, it continues to be the drug of choice in the management of paediatric epilepsy. The second most common drug prescribed in our study was clobazam.[13] The reason for this is that majority of the

patients were diagnosed with febrile seizures and clobazam is the drug of choice.

Levetiracetam was the only new antiepileptic drug that was prescribed in 10% of patients. Among dual and polytherapy, majority of the patients received older drugs in combination with newer drugs (11.33%). Majority of the patients who received polytherapy were combined with newer drugs like levetiracetam, vigabatrin, topiramide, zonisamide along with older drugs. This results were similar to the report by Putignano et.al.[15]. While study by Maity[16] reported that lamotrigine and oxcarbazepine was the most commonly used newer AED, which was in contrast to our study results. As per the guidelines recommended by national institute of clinical excellence (NICE), it is advised that sodium valproate should be the drug of choice and considered as first line of therapy for generalized tonic clonic seizures.[17,18]

As per American academy of neurology guidelines for epilepsy, EEG is considered as routine neurodiagnostic tool for diagnosis epilepsy.[12] All the 150 patients had got the EEG done, which was higher in our study compared to study results conducted by Mistry et al1.[3] Among 150 children, 89 patients (59.33%) reported abnormality in EEG reports. Few of the patients also had CT/MRI along with EEG as a diagnostic tool for confirmatory results.

The newer antiepileptic drugs have very limited clinical experience and costly, because of which these drugs are considered as add on drugs and reserved for those who do not respond to the older antiepileptics. As per the NICE guidelines, newer AEDs can be considered as first line drug only when they can prove their efficacy and safety through clinical trials in comparison to older AEDs. The limitations of our study include larger sample size. The present study, states that monotherapy is the first best choice of treatment used in all types of epilepsy and is preferred over dual or polytherapy. Monotherapy is considered as best modality, due to its low cost, safety profile and lesser drug interactions, while it can also improve in drug treatment compliance and adherence. Polytherapy can be considered only in those conditions where seizures are not being controlled even with maximum dose. Hence, monotherapy is considered as the effective and gold standard for the treatment of epilepsy.[19-21]

Conclusion

Along with the older AEDs, there has been increased in the utilization of newer AEDs as well, which help to broaden the therapeutic option towards the management of childhood epilepsy with better safety profile. For more rationale approach towards the treatment, nation based studies and guidelines will be more beneficial. Such studies play a role in altering the prescription guidelines at tertiary care centres.

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Conflict of Interest

Nil

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