Drug Utilization Study in Epilepsy in a Tertiary Care Hospital

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Treatment of epilepsy is quite challenging as it requires the antiepileptic drugs to be taken for a long duration, sometimes throughout the lifetime of the patient. But such chronic drug intake results in adverse effects, drug interactions and added economic and emotional distress to the patients. It is therefore of utmost importance to analyze the pattern of prescription of antiepileptic drugs, including the concurrent medications in epilepsy. The present study was conducted to collect, assess and understand the above data and also to analyze the rationality and correctness of prescription using the WHO prescription indicators. A total of 100 case records of patients diagnosed with epilepsy was analyzed and the data was recorded. We had a total of 66 children and 34 adult patients in our study. Generalized tonic-clonic seizures was the common type of seizure. Phenytoin was the most commonly prescribed antiepileptic drug. 1/3rd of the patients needed more than one drug for adequate seizure control and the most common add on drug was levetiracetam. Also, the average number of drugs prescribed to the patients was 6 which included drugs given for concomitant illnesses as well. Average number of medicines per prescription was 6. Prescription by generic name was seen in 42% of the cases. An injection was prescribed in 66% of the prescriptions. An antibiotic was encountered in 38% of the prescriptions. Most of the epileptic patients are subjected to polypharmacy which puts them at a higher risk of side effects, drug interactions and financial burden. Physicians should minimize the use of drugs and look into the rationality of each prescription.

Keywords: Antiepileptic drugs, prescription pattern, WHO prescription indicators, seizures.

Epilepsy is characterized by recurrent seizures and is a chronic disease. Every year, 2.4 million people are diagnosed with epilepsy.[1] Regular treatment with antiepileptic drugs (AEDs) help majority of the patients to remainseizure free.

However, adverse effects of AEDs are numerous and it is one of the reasons why patient compliance with antiepileptic drugs is low.[2]Earlier there were limited drugs to choose from but recently many more antiepileptic drugs have been added to the

list. Phenytoin, carbamazepine, sodium valproate are still being used widely. Newer antiepileptic drugs like lamotrigine, levetiracetam are being increasingly preferred for lesser adverse effects and greater patient acceptability. Cost of the drugs is one more factor to be considered while choosing the appropriate drug for a patient.[1]Most of the time patients usually require more than one drug for remaining seizure free. Such polypharmacy enhances the risks of drug interactions, adverse effects and adds to the financial burden of the patient.[2]The side effects of these antiepileptic drugs can sometimes be life threatening and most of the time is responsible for treatment failure.[3] There are limited studies monitoring the adverse drugs reactions related to AEDs. Different studies have shown different percentages of patients experiencing adverse effects of these drugs which usually varies depending on the drug, dosage, duration of treatment and follow up.[4]To choose from the numerous drugs is a difficult task and depends mainly on the tolerability of the patient because efficacy wise most of the drugs are similar in nature.[5]There is no conclusive evidence regarding the safety of antiepileptic drugs, even the clinical trial information is inconclusive.[6,7] Moreover, the safety of newer AEDs is yet to be concluded and it may require manymore years to detect their all side effects.[4]Patients with epilepsy are often subjected to polypharmacy because of the concomitant illness as well that are present along with epilepsy. In epilepsy, patients have to take medications for a long duration, sometimes lifelong. So, the patient is at risk for numerous drug interactions throughout. It is very important to study the drug prescription pattern in epileptic patients. Drug utilization studies give us an insight to the drug usage among patients and helps us decide on the rationality of such use. Irrational prescribing can lead to therapeutic failures, unwarranted adverse effects, and additional economic burden on the patients. The information obtained from such

studies aids in planning guidelines for a particular disease. Therefore the current study attempts to analyze the drug utilization trend in different types of epilepsy including the extent of polytherapy in patients belonging to different age groups and determining the rationality of these prescriptions.

MATERIALS AND METHOD

The study was conducted after the protocol was cleared by the institutional ethics committee. It is retrospective study based data collected from the hospital records. Prescriptions of epileptic patients of all age groups admitted to Kasturba Medical College Hospital, Attavara, Mangaluru from 2017-2018 were analyzed and the following data were collected in the study proforma. Demographic details of the patient, clinical diagnosis, co-morbid conditions and the drug details such as the number of drugs per prescription, route, dose, dosage form and duration were noted. Patients with secondary seizures were excluded from the study.The data was analysed for WHO prescribing indicatorswhich included the percentage of: a. drugs prescribed by generic name b.encounters with antibiotics prescribed c. encounters with injections prescribed d. drugs prescribed from essential drug list and the average number of medicines per prescription.[8]Statistical Analysis:SPSS software version 20 was used for analyzing the data.

RESULTS

Data of 100 patients admitted to the hospital with diagnosis of epilepsy was collected and analyzed. Out of the 100 patients, sixty-six were children and the remaining adults. Gender wise distribution of patients is depicted in table 1. The commonest type of epilepsy in adults as well as children was generalized tonic-clonic (GTCS) seizures. (Table 2) And the second most common in

Table 1. Age and gender distribution of
epileptic patients (n=100)

| Children (age <18years) | | Adults (age >= 18years) | |
Males	Females	Males	Females
39	27	25	09
Total = 66		Total = 34	

Table 2. Epilepsy type (Total -100 patients)

Children (n = 66)		Adults (n = 34)	
Type	Number	Type	Number
Generalized tonic- clonic seizure	50	Generalized tonic- clonic seizure	29
Simple partial seizure	3	Simple partial seizure	4
Complex partial seizure	2	Myoclonic seizure	1
Myoclonic seizure	4		
Status epilepticus	7		

Table 3. Number of medicines per prescription

Number of medicines	Prescriptions (n=100)
Single	2
2-4	19
5-9	77
10 or more	2

Table 4. Percentage of prescriptions with the following AEDs either as single or combination therapy (n =100)

Drug	Percentage
Phenytoin	40
Sodium Valpraote	35
Carbamazepine	14
Phenobarbitone	19
Midazolam	23
Lorazepam	15
Clobazam	4
Lamotrigine	2
Levetiracetam	32
Oxcarbazepine	5
Divalproex	1
Lacosamide	2

adults was simple partial seizures while in children it was status epilepticus. An average of 6 drugs were prescribed per prescription. Out of the 100 prescriptions 77% of the prescriptions had more than 4 drugs each (Table 3). The most commonly prescribed antiepileptic drug was phenytoin (40%) followed by sodium valproate (38%). (Table 4) Thirty two percent of the patients were on single AED while the remaining were on multiple drugs for control of seizures. The most common add on drug was found to be levetiracetam.

WHO prescribing indicators – All the 100 prescriptions were analyzed according to the WHO prescribing indicators. A total of 561 medicines were prescribed in the total number of prescriptions which included the drugs prescribed for concomitant illnesses along with epilepsy. Average number of medicines per prescription was 6. Prescription by generic name was seen in 42% of the cases. An injection was prescribed in 66% of the prescriptions. An antibiotic was encountered in 38% of the prescriptions. The number of medications prescribed from National Essential Medicine List was 62%.

DISCUSSION

Drug utilization studies are primarily conducted to encouragerational usage of drugs. The utilization pattern could be of drug groups (like analgesics)for various indications or could be in particular diseases (use of various drugs in conditions like epilepsy). These studies help us in understanding the target patients, the various indications as well as the rationality of drug usage. Drug utilization study in chronic diseases like epilepsy is essential because in such diseases patients are exposed to drugs for a long time and sometimes lifelong. Moreover, these diseases require polytherapy for the condition itself as well as for the comorbid conditions. Adverse effects, drug interactions, enhanced economic burden on the patients are the main drawbacks of polytherapy. So the various prescribing indices should be understood in such situations. In the present study, the various drug usages and patient characteristics in epilepsy was analyzed.

In the present study, a higher prevalence of epilepsy was found in males compared to females. The reason postulated behind lower rate of epilepsy in females is that the female sex hormones are supposed to protective against seizures. The same results are echoed in other studies as well.[9,10]GTCS

was the most frequent type of epilepsy seen in our study. Most of the previous studies have proved GTCS to be the most predominant type of epilepsy overall.[9]Phenytoin (40%) was the most common antiepileptic drug prescribed as mono-therapy followed by sodium valproate (38%). This is similar to previous studies.[10,11] But in some of the other studies, sodium valproate was the most frequently prescribed drug. The difference between the two drugs in this study was very less and this in congruency with other studies may be due to the limited sample size of our study.[9,12]Moreover some of these studies have considered either paediatric or adult patients and not both. Majority (68%) of our patients required more than one antiepileptic drug for control of seizures and only 32% were seizure free with mono-therapy. In other studies also similar statistics was seen.[13,14]

Based on the WHO prescribing indicators, some parameters were favorable while some showed poor prescription practices. The average number of medications per prescription was 6 which was not optimal as per the WHO indicators. This could be because the study was carried out in a tertiary care hospital and most of the patients presenting with epilepsy had other serious forms of illnesses including bacterial infections which could have necessitated increased number of drug usage. The same could be reason behind higher usage of antibiotics and injections per prescription. Prescription by generic name was 42% of the total drugs prescribed. Though compared to other studies, it is a good trend but it needs to improve further as prescription of generics will reduce the cost of treatment as well as medication errors.[13,15]

CONCLUSION

Most of the epileptic patients in this study were subjected to polypharmacy which lays them at additional risk of drug interactions, increased cost of treatment and additional adverse effects. Guidelines should be set up to encourage minimizing the number of medications per prescription and use of each drug should be justified.

Limitations of the study

Small sample size and not including outpatients was a major limitation of the present study. Analyzing adverse drug reactions is also an important part of drug utilization studies, but since it was a retrospective study, we could not collect much data regarding it. Therefore further studies with greater sample size should be performed to gather additional information on drug utilization in epilepsy.

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