

Prescription pattern in epilepsy in paediatric age group in tertiary care teaching hospital

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ABSTRACT

Epilepsy is a prevalent chronic neurological disorder in paediatric population and Anti-epileptic Drugs (AEDs) have a narrow margin of safety. The aim of this study was to analyse use of various AEDs and type of epilepsy prevalent in our population. In this study prescriptions for epilepsy from paediatric outpatient department, over five month period (from January 2015 to May 2015) were retrospectively analysed.

Total of 160 prescriptions were analysed. 95 (59.3%) were female and 65 (40.7%) were males. 70 (43.8%) patient belonged to 11-15 years of age group, 49 (30.6%) patient belonged to 6-10 years age group, 41 (25.6%) patient belonged to 0-5 years age group. Generalised Tonic Clonic Seizure (GTCS) was the most common diagnosed epilepsy (61.5%), followed by Partial seizure (30.6%) and Absence seizure (8.5%). 117 (73.1%) patient were prescribed monotherapy whereas polytherapy were given to 4 (2.5%) patient. 39 (25%) patient were given two drug combination. Sodium valproate was commonest monotherapy (53%) followed by Carbamazepine (29.9%), Phenytoin (8.5%) and Phenobarbitone (8.5%). Sod. Valproate with Phenytoin was commonest prescribed two drug combination (48.7%) followed by Sodium valproate with Phenobarbitone (28.2%). Among polytherapy Sodium valproate with Phenytoin and Levetiracetam were given to 3 patient.

In this study GTCS was most common diagnosis and conventional AED were commonly used. Sod. valproate was commonest prescribed AED as monotherapy and in combination therapy.

Keywords: Epilepsy, Anti-epileptic Drug (AED), Generalised Tonic Clonic Seizure (GTCS), Prescription pattern, Tertiary care hospital

INTRODUCTION

An epileptic seizure is a transient paroxysm of uncontrolled discharges in neurons and a medical condition with recurrent, unprovoked seizures.¹ Epilepsy is a common pediatric problem and approximately 6-7% of children suffer at least one or more epileptic seizures.² There are several prevalence studies however and a recent meta-analysis suggest that the prevalence rate is 5.59 per 1000 population with no gender and geographical differences.³ This rate is surprisingly similar to the rate in developed country. Children with epilepsy are prescribed antiepileptic medication with the aim of control of seizures, minimum drug side effects and improved quality of life.^{4,5}

As most of the antiepileptic drugs have a narrow therapeutic and safety margin, high doses of antiepileptic drugs can lead to side effects, on the other hand suboptimal doses will lead to recurrence of seizures. Also, wrongly chosen drugs result in poor control of epilepsy or sometimes increase in seizure frequency.

The choice of most appropriate antiepileptic drug (AED) depends on classification of seizures and age of patient.^{5,6} Seizure control may be achieved by monotherapy in about 80% of the patients, with the other 20% requiring two to three AEDs.⁷ Monotherapy is normally the first line of treatment,

as it has less drug interactions and side effects; lower cost, better tolerability, medication adherence, and quality of life but polytherapy is often required for patients with multiple seizure types or refractory disease.⁸

A large number of drugs are currently available for the treatment of epilepsy. Conventional drugs like Phenytoin, Carbamazepine, Sodium valproate and Ethosuximide are commonly used as first line drugs. They are relatively less expensive than the newer antiepileptic drugs like Gabapentin, Lamotrigine, Vigabatrin, Topiramate, Tiagabine and Zonisamide. They have lesser adverse effects and have a few drug interactions.^{9,10}

When choosing an AED, factors such as mechanism of action, ease of dosing, efficacy, long term adverse effects, neuropsychiatric profile, sedative burden, interaction with other medications, seizure types and other co-morbid conditions should be considered.^{11,12} Usage of AEDs differs in different geographical regions, depends partly on economic status and drug availability.

The aim of this study was to analyse use of various AEDs and type of epilepsy prevalent in our population.

MATERIALS AND METHODS

This retrospective analytical study was carried out in Dr. Bhim Rao Ambedkar hospital, Raipur (C.G.) associated with Pt JNM Medical college, Raipur(C.G.). Permission was obtained from institutional ethical committee. All prescription, over 5 month period (January 2015 to May 2015) for epilepsy from paediatric out patient department were collected and analysed as per WHO guideline "How to investigate drug used in health facilities".¹³ Diagnosis was confirmed by two paediatrician based on the clinical presentation of seizures, Electroencephalogram (EEG) and scan test.

Patients demographic details, clinical diagnosis, type of epilepsy, type of AED used, drug dose and frequency were recorded. Drug used as oral or parenteral were noted. Average number of drug per prescription were calculated. Other co-prescribed drug were noted. The epileptic seizures were categorized according to the classification of international league against epilepsy.¹⁴ However, patients having more than one type of seizures were categorized as unclassified seizure or mixed type of seizure. The patients were further classified in to different age group: 0-5, 6-10, 11- 15, 16- 18 years. According to numbers of drug prescribed, patients were grouped as monotherapy, two-drug combination and polytherapy. The patients using three or more drug were classified as polytherapy. Phenytoin, Carbamazepine, Sodium valproate, Phenobarbitone were categorized as conventional AED. Levetiracetam, Topiramate, Zonisamide as newer AED. Various other similar studies on this subject were studied and compared with prescription of this study.

RESULTS

Total 160 prescriptions were analysed. 95 female and 65 male (figure -1). 70 patients were age group of 11- 15 year, 49 patients of 6-10 year and 41 patients of 0-5 year (figure-2). GTCS was more common diagnosis 98, partial seizure 49, absence seizure 10 and unclassified seizure 3 (figure-3). 117 (73.1%) were on monotherapy, 40 (25%) were taking two-drug combination therapy, 4 (2.5%) were prescribed polytherapy. Sodium valproate was the commonest monotherapy 62 (53%), followed by Carbamazepine 35(29.9%), Phenytoin 10(8.54%), and Phenobarbitone 10 (8.54%) (table-2).

Sodium valproate with Phenytoin was most frequent 2-drug combination (19), followed by Sodium valproate with Phenobarbitone (11), Sodium valproate with Carbamazepine (5), Carbamazepine with Phenytoin (2) (table-3). Sodium valproate, Phenytoin with Levetiracetam were commonest polytherapy (table -4). Other type of combinations are shown in table 3 and 4.

Oral route were preferred in all patients, parenteral drug was not given to any patient. 66

patients were given Calcium supplement, B-complex 31, Multi-vitamin 21, Folic acid 18, Cough syrup 14, Colecalciferol sachet 10. Paracetamol, Amoxicillin, Albendazole, Diclofenac sodium, Pantoprazole were other co-prescribed drugs (table-8). Average number of drug per prescription was 2.41.

Table 1: AEDs used in this study

"Conventional" AEDs	"Newer" AEDs	Benzodiazepine
Sodium valproate Carbamazepine Phenytoin Phenobarbitone	Levetiracetam Topiramate	Clobazam

Table 2: Monotherapy

Drugs	Total=117	%
Sod. Valproate	62	53
Carbamazepine	35	29.9
Phenytoin	10	8.5
Phenobarbitone	10	8.5

Table 3: Two-drug combination

Drugs	Total = 40	%
Sod. Valproate + phenytoin	19	48.7
Sod. Valproate + phenobarbitone	12	28.2
Sod. Valproate + carbamazepine	5	12.8
Phenytoin + phenobarbitone	1	2.6
Carbamazepine + levoteracetam	2	5.1
Carbamazepine + topiramate	1	2.6

Table 4: Polytherapy

Drugs	Total = 4	%
Sod. Valproate + phenytoin + levoteracetam	3	75
Sod. Valproate + phenobarbitone + phenytoin	1	25

Table 5: Co-prescribed drugs

Drugs	Number
Calcium	66
B-complex	31
Multi-vitamin	21
Cough syrup	14
Colecalciferol sachet	10
Paracetamol	5
Amoxicillin	4
Albendazole	3
Diclofenac sodium	3
Pantoprazole	2

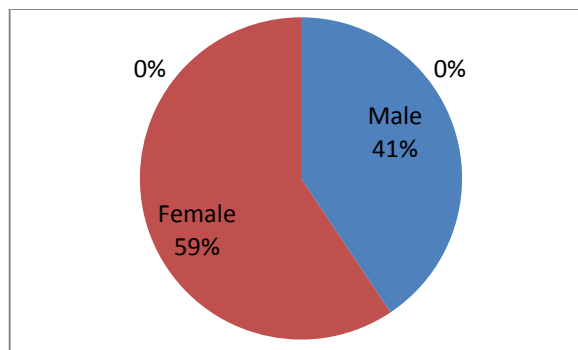


Fig. 1: Graphical presentation of the distribution of 160 epileptic patients based on the gender

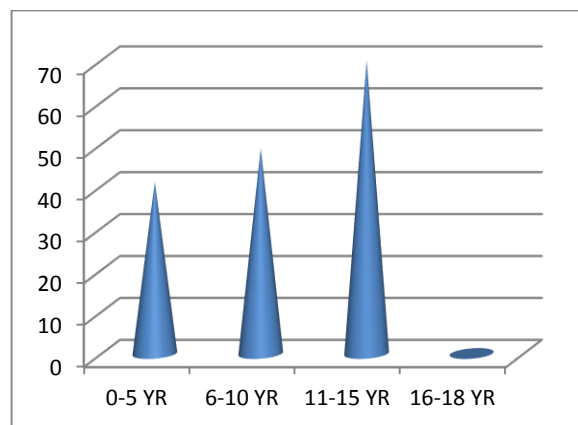


Fig. 2: Graphical presentation of the distribution of age group with number of patients

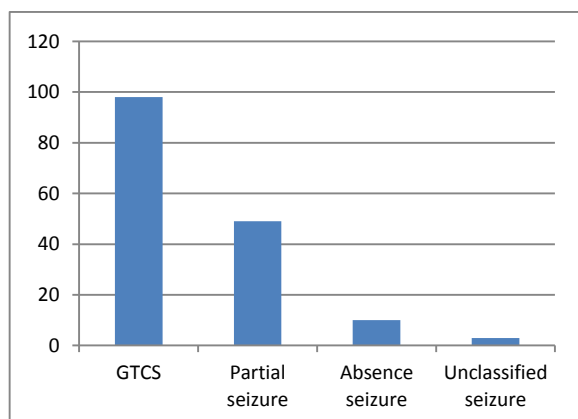


Fig. 3: Graphical presentation of the distribution of type of seizure with number of patients

DISCUSSION

In this retrospective analytical study 160 prescriptions for epilepsy in paediatric patients were analysed. It was found that higher percentage of patients were female (59.3%) than male patients (40.7%). Various epidemiological studies on epilepsy are unable to explain a differences in gender distribution in their study population.^{11,15,16} And some study describe a female preponderance.^{15,17} Though reasons behind gender differences are not clear but it

suppose that estrogen has seizure activating effect.¹⁸ Maximum patient in this study were of age group 11-15 years(43.8%) followed by 6-10 years (30.6%) and 0-5 years (25.6%). According to literature, the incidence of epilepsy has bimodal distribution with peak in 1st decade and a second peak in elderly.^{19,20,21}

A higher percentage of patient were found to have GTCS(61.53%), as in other study done by sachchidanad Pathak et al. ²²30.6% patients were have partial seizure, absence seizure were 8.5%. However the type of epilepsy could not be identified in 3 patients. In this study most of the patients were prescribed monotherapy (73.1%) whereas polytherapy were given to only 2.5% of patients. Like earlier studies.^{22,23,24} 25% of patients were used two drug combination therapy. Polytherapy may leads to increase in side effects, drug interactions and adversely affect quality of life.^{25,26,27} Nevertheless multiple drug therapy is unavoidable in some resistant cases, monotherapy in its higher tolerated dose not only can control epilepsy but also reduces occurrence of convulsion frequency and increases compliance.^{11,12}

Despite availability of Various newer AED with equal effectiveness and better tolerability, conventional AEDs were mostly prescribed. It may be due to low cost.²² Availability in government supply as these are included in Essential Drug List (EDL).²⁸ and ability to effectively control seizure. But higher propensity to cause side effect is matter of concern.²⁴

Among conventional AED, Sodium valproate was most commonly preferred AED as monotherapy(53%), followed by Carbamazepine (29.9%), Phenytoin(8.5%) and Phenobarbitone (8.5%). This was in contradiction with earlier study by Shih-Hui et al²³, where Carbamazepine was found to be most commonly used AED as monotherapy. In another study done by Juny Sebastian et al ²⁹ Phenytoin was most commonly used AED as monotherapy (41.7%) followed by Valproate(41%). Whereas, like this study, sachchidanadpathak et al.²² found, Sodium valproateas most commonly used AED as monotherapy. Sodium valproate was also more commonly used in two drug combination therapy and in polytherapy as well. Due to its broad spectrum of activity, Sodium valproate was used to control most of the GTCS, partial seizure and absence seizure. Newer AED were not commonly prescribed. May be due to higher cost²² and nonavailability in government supply, as they are still not included in EDL.²⁸Levetiracetam and Topiramate are newer AED used in this Study.

Amongs two drug combination therapy, Sodium valproate with Phenytoin was most commonly used (47.5%) followed by Sodium valproate with Phenobarbitone(30%) and Sodium valproate with Carbamazepine (12.5%). Unlike

earlier study, where Phenytoin with Phenobarbitone was most commonly used two drug combination therapy.²⁹ Amongspoly therapy, Sodium valproate with Levetiracetam and Phenobarbitone were given to 3 patients followed by Sodium valproate with Phenytoin and Phenobarbitone (1). Clobazam a Benzodiazepine was used as adjuvant to Sodium valproate in 3 patients with GTCS. Oral route was preferred in all the patients for drug administration. Because oral administration is easy and painless.

Calcium was the most common co-prescribed drug 66 (42.1%), followed by B-complex 31(19.4%), Multi-vitamin 21(13.1%) and Folic acid 18(11.3%) (table-5). Some antiepileptic drugs specially Phenytoin, interferes with calcium and vitamins absorption and metabolism, and are prone to cause side effect like Osteomalacia and Megaloblastic anaemia.³⁰

CONCLUSION

To conclude, GTCS was the most common diagnosis and monotherapy was preferred modality of treatment. Most commonly used AED as monotherapy was Sodium valproate followed by Sodium valproate with Phenytoin in combination therapy. It was concluded that Prescription pattern in this study is relevant with current trend of prescription pattern.

However our study was limited to single hospital with limited number of patients and was designed to limited duration of time.

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