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PRESCRIBING PATTERNS OF ANTI-EPILEPTICS IN PEDIATRICS AT A SECONDARY CARE HOSPITAL

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ABSTRACT

Introduction: Epilepsy is one of the most common serious neurological disorders affectingabout 22 million people as of 2013. It affects 1% of the population by age 20 and 3% of the population by age 75. It is more common in males than females. Most of those with the disorder (80%) are in the developing world. The estimated prevalence of active epilepsy as of 2012 is in the range 3–10 per 1,000, with active epilepsy defined as someone with epilepsy who has had a least one unprovoked seizure in the last five years. Epilepsy begins each year in 40–70 per 100,000 in developed countries and 80–140 per 100,000 in developing countries. Poverty is a risk in the developed world epilepsy most commonly starts either in the young or in the old.

KEYWORDS: Anti-Epileptic Drugs, Pediatric Population and CBCL.

Babies born to mothers using neurotoxic drugs such as cocaine, heroin, or ethanol are susceptible to drug-withdrawal seizures in the first few days after delivery. Hypoglycemia and Hypocalcemia, which can occur as secondary complications of perinatal injury, are also causes of seizures early after delivery.

The most common seizures arising in late infancy and early childhood are febrile seizures, which are seizures, associated with fevers but without evidence of CNS infection or other defined causes. The overall prevalence is 3–5% and even higher in some parts of the world such as Asia. Patients often have a family history of febrile seizures or epilepsy.

Table 1: Etiology of Epilepsy In Children.

Neonates(<1month)	Perinatal hypoxia and Ischemia Intracranial hemorrhage and TraumaAcute CNS infection Metabolic disturbances(hypoglycemia, hypocalcemia, hypomagnesemia, pyridoxine deficiency) Drug withdrawal Developmental disorders Genetic disorders
Infants and children (>1 month and <12years)	Febrile seizures Genetic disorders (metabolic, degenerative, primary epilepsy syndromes) CNS Infection Developmental disorders Trauma
Adolescents (12–18 years)	Genetic disordersInfection Brain tumour

TREATMENT OR STANDARD THERAPY

Table 2: Selection of Anti-Epileptic Drugs.

Selection of Antiepileptic Drugs			
Generalized-Onset Tonic-Clonic	**Focal**	**TypicalAbsense**	**Atypical**
First-Line			
Valproic acid	Lamotrigine	Valproic acid	Valproicacid
Lamotrigine Topiramate	Carbamazepine	Ethosuximide	Lamotrigine
	Oxcarbazepine		Topiramate

	Phenytoin		
	Levetiracetam		
Alternatives			
Zonisamide	Topiramate	Lamotrigine	Clonazepam
Phenytoin	Zonisamide	Clonazepam	Felbamate
Carbamazepine	Valproic acid		
Oxcarbazepine	Tiagabine		
	Gabapentin		
Phenobarbital	Lacosamide		
Primidone	Phenobarbital		
Felbamate			

METHODOLOGY

Study Site

This study was conducted at AP-VVP AREA Hospital, Narasaraopet Guntur.

Study Design

This is a prospective observational study conducted in the patients prescribed with anti-epileptics agents and assessed their utilisation pattern inepileptic conditions.

Study Criteria: The study will be carried out by considering the following criteria:

Inclusion Criteria

Children aged 0-15 years who received at least one prescription of anticonvulsant drugs were selected in the department of pediatrics in APVVP-AREA Hospital, Narasaraopet.

Exclusion Criteria

- Age > 15 years,
- Diseases other than epilepsy was observed are excluded.
- We reviewed the case sheet of the Patient who had Epilepsy disorder and collect the data required for the study i.e. Socio demographic Data and Anti epileptics Prescribed their Dose, dosage, duration, timing of administration, route of administration, Monitor the Vitals, Length of hospital stay and patient will be Followed up till Discharge to identify any drug related problems.

Data Analysis

All the data was subjected to analysis in order to assess the pattern of utilization ofanti-epileptic agents. The data was analysed and the percentage value was calculated for the use of different class of anti-epileptic drugs. The nature and extentof use of each class and individual anti-epileptic drugs was also determined.

Statistical Analysis

Chi square test for categorical variables and Student's test for continuous variables were used to assess the differences between AED users. Significance was set at a level of $P < 0.05$. Statistical analyses were performing using GRAPHPAD PRISM.

RESULTS AND DISCUSSION

In all, over a period of 6 months from January 2022 to July 2022, a total of 105 medical case records were collected, scrutinized and analyzed for epidemologica profile, disease incidence and drug prescription.

This observational, prospective non-interventional and medical audit-study presented here in, has revealed results which are as follows.

Table 3: Demographic Profile of Epilepsy Patients.

Age Groups	Male	Female	No of Patients (%)
0-12 months	8(14.8)	11(21.5)	19(18.09)
1-6 years	23(42.5)	28(54.9)	51(48.57)
7-12 years	8(14.8)	7(13.7)	15(14.28)
12y and above	15(27.7)	5(9.80)	209(19.04)
Total	54	51	105(100)

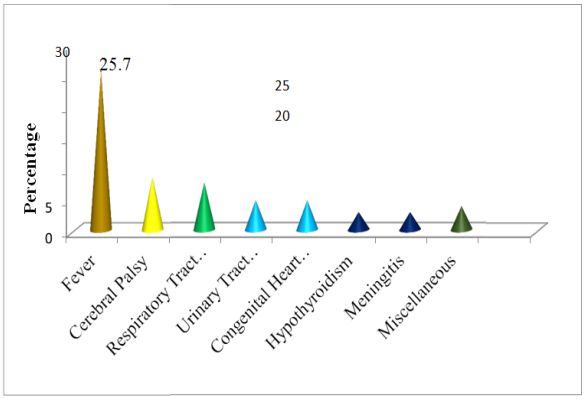

Fig. 1: Incidence of Co-Existing Diseases with Epilepsy.

Table 3 and Figure 1 highlight the incidence of epilepsy alone as a single clinical entity and that with coexisting diseases such as fever, cerebral palsy, respiratory tract infections and urinary tract infections. Incidentally, patients of epilepsy alone constitute 39.04%, whereas those with fever, cerebral palsy, respiratory tract infections and urinary tract infections together constitute 25.7%, 8.57%, 7.61% and 4.76% of the total number of 105 patients respectively. [$\chi 2 = 4.685$, $p = 0.69834075$].

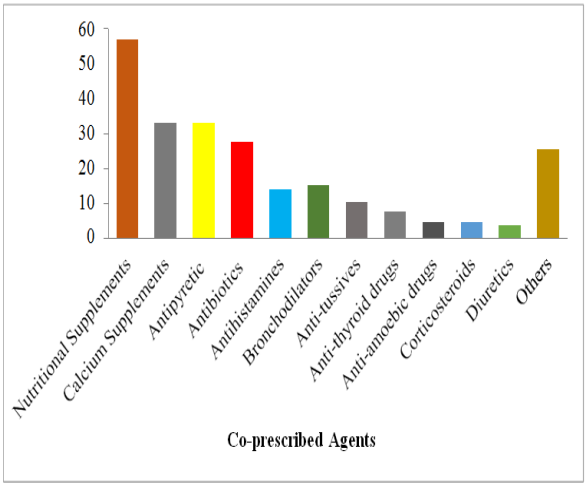

Figure 2: Extent& Pattern of Drugs Co-Prescribed with AntiepilepticAgents.

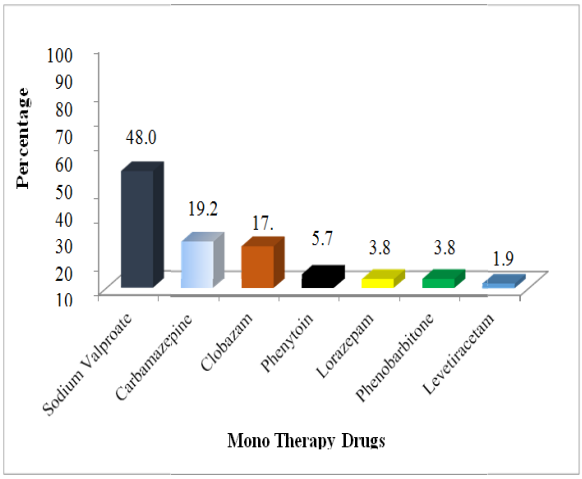

Figure 3: Prescription Pattern Of Antiepileptics (Monotherapy).

From figure 2 depict the Extent & pattern of drugs co-prescribed with antiepileptic agents. 60 patients out of the total 105 received Nutritional supplements. Accordingly, Nutritional supplements was the most commonly Co- prescribed drugs (57.01%) followed by a Calcium Supplements (33.33%), Antipyretics (33.33%), Antibiotics (27.06%) in that order. These were given individually along with anti-epileptics or combinations of different group drugs. [$\chi 2$ = 1.1477; p <0.88664]

From Figure 3 depict the prescription pattern of the individual group of antiepileptic agents (Monotherapy). 52 patients out of the total 105 received Monotherapy (one selected individual drug from each representative group). Accordingly, Sodium Valproate was the most commonly prescribed drug (37.07%) followed by a Carbamazepine (27.41%), Clobazam (18.15%), Phenytoin (17.37%) in that order. In all, Monotherapy was the main prescription trend in 52 patients out of 105 (49.52%). [$\chi 2$ = 1.1477; p <0.88664]

Table 4: Drug Combinations Prescribed in the Treatment of Epilepsy.

Drug Combinations	Number of Patients	Percentage (%)
Clobazam + Sodium Valproate	07	13.20
Clobazam + Lorazepam	06	11.32
Phenytoin + Levetiracetam	04	7.54
Clobazam + Phenytoin	03	5.66
Clobazam + Levetiracetam	02	3.77
Phenytoin + Carbamazepine	02	3.77
Serenace + Lorazepam	02	3.77
Lorazepam + Phenobarbitone	02	3.77
Sodium Valproate + Phenobarbitone	02	3.77
Phenytoin + Sodium Valproate	02	3.77
Phenytoin + Lorazepam	02	3.77
Carbamazepine + Oxcarbamazepine	01	1.88
Levetiracetam + Oxcarbamazepine	01	1.88
Oxcarbamazepine + Levetiracetam +SodiumValproate	03	5.66
Clobazam + Levetiracetam +Lorazepam	02	3.77
Lorazepam + SodiumValproate + Levetiracetam	01	1.88
Levetiracetam + Phenobarbitone + Lorazepam	01	1.88
Lorazepam + Sodium Valproate + Clobazam	01	1.88
Levetiracetam + Phenytoin + SodiumValproate + Clobazam	02	3.77
Levetiracetam + Phenytoin + Carbamazepine + Clobazam	01	1.88
Sodium Valproate + Clobazam + Lorazepam + Phenytoin	01	1.88

The overall percentage of patients receiving the various anti-epileptic drug- combinations is 50.47%.

Table 5: Prescription Pattern of Antiepileptics.

Drugs Prescribed	Number of Patients	Percentage (%)
Monotherapy	52	49.5
Two – drug therapy	36	34.2
Three – drug therapy	08	7.61
Four – drug therapy	06	5.71
Five - Drug therapy	03	2.85
Total	105	100

Table 5 illustrate the prescription pattern of antiepileptic drugs as Monotherapy and combination therapy in the study subjects. Table 12 and Figure 18 indicate the prescription pattern of antiepileptic drugs in patients of epilepsy. The overall number of patients given Monotherapy is 52(49.5%) out of 105. In these prescriptions Sodium Valproate represents the main antiepileptic component in the Monotherapy, Clobazam and Lorazepam in two-drug, three- drug and also four drug treatment regimens [$\chi 2$ =24.408, p ←0.0004392, highly significant]. These patients have also received the conventional antipyretics and antibiotics.

Table 6: Extent & Pattern of Overall Group-Wise Anti-Epilepsy Drug Prescriptions Inclusive Of Monotherapy and Combination Therapy.

Drugs Prescribed	Number Of Patients	Percentage (%)
Sodium Valproate	25	23.80
Carbamazepine	10	09.52
Clobazam	09	08.57
Phenytoin	03	02.85
Lorazepam	02	01.90
Phenobarbitone	02	01.90
Levetiracetam	01	0.95
Clobazam + Sodium Valproate	07	06.66
Clobazam + Lorazepam	06	05.71
Phenytoin + Levetiracetam	04	03.80
Clobazam + Phenytoin	03	02.85
Clobazam + Levetiracetam	02	01.90
Phenytoin + Carbamazepine	02	01.90
Serenace + Lorazepam	02	01.90
Lorazepam + Phenobarbitone	02	01.90
Sodium Valproate + Phenobarbitone	02	01.90
Phenytoin + Sodium Valproate	02	01.90
Phenytoin + Lorazepam	02	01.90
Carbamazepine + Oxcarbamazepine	01	0.95
Levetiracetam + Oxcarbamazepine	01	0.95
Oxcarbamazepine + Levetiracetam + Sodium Valproate	03	02.85
Clobazam + Levetiracetam + Lorazepam	02	01.90
Lorazepam + SodiumValproate + Levetiracetam	01	0.95
Levetiracetam +Phenobarbitone + Lorazepam	01	0.95
Lorazepam + Sodium Valproate + Clobazam	01	0.95
Levetiracetam + Phenytoin + Sodium Valproate + Clobazam	02	01.90
Levetiracetam + Phenytoin + Carbamazepine + Clobazam	01	0.95
Sodium Valproate +Clobazam + Lorazepam + Phenytoin	01	0.95
Clobazam + Phenytoin + Carbamazepine + Lorazepam	01	0.95
Levetiracetam + Phenytoin + Oxcarbamazepine + Sodium Valproate	01	0.95
Levetiracetam + Oxcarbamazepine +Lorazepam + Phenytoin + Sodium valproate	01	0.95
Sodium Valproate + Levetiracetam + Phenobarbitone + Carbamazepine +Lorazepam	01	0.95
Levetiracetam + Lorazepam + Phenytoin + Sodium Valproate + Phenobarbitone	01	0.95
Total	105	100

However, Table 6 enlighten the extent and pattern of overall group wise antiepileptic drug prescriptions in a total sample of 105 patients. Sodium Channel Blockers (16), GABA Receptor Agonists (36), GABA Modulators

(14),Barbiturates (05), Benzodiazepines (25), Anti manic agents (12) and Narcotic Agents (13) have been the most commonly used groups of antiepileptics in order of preference in this study.

SUMMARY AND CONCLUSION

Interestingly, in the present study, 52 out of the total 105 patients received Monotherapy (single drug), whereas 53 patients received combination therapy (Fig. 3 & 4). In patients who received Monotherapy, the most commonly prescribed drug was a sodium valproate, followed by Carbamazepine, clobazam and phenytoin, in that order. Sodium valproate (48.07%), Carbamazepine (19.23%), Clobazam (17.30%) and Phenytoin (17.37%) were the most frequently used individual drugs from the respective groups (Table 4 & 5).

In a total of 105 patients, a sodium valproate was the most preferred antiepileptic agent (23.80%), followed by Carbamazepine (9.52%), and a clobazam (8.57%), inthat order.

Incidentally, in this study, the choice of sodium valproate, Carbamazepine clobazam, and phenytoin in preference to other drugs from the same respective groups is overwhelming and noteworthy. In fact, these individual drugs form the main stay in almost all the prescriptions with very few exceptions, as components of either Monotherapy or combination therapy. Thus, the importance of sodium valproate, Carbamazepine clobazam, and phenytoin either individually and/or in appropriately chosen combinations is realized.

A total of 105 case-records of patients with epilepsy were collected forthe analysis of various prescription patterns. It was observed that fever and cerebralpalsy were the co-existing disease entities in some of the patients. The incidence ofepilepsy was found to be more or less similar in males and females. Sodium valproate has been the most preferred anti-epileptic agent used in this study. Similarly, Carbamazepine, clobazam, and phenytoin have been the next commonly used drugs. All the aforementioned anti-epileptic agents have figured in both Monotherapy and combination therapy in appropriate clinical situations.

In conclusion, good prescribing practices have prevailed in the hospital where this study was undertaken and the treatment protocol followed is in consensus with standard international guidelines, although, the order of preference in the choice of anti-epileptics in general might indicate a slight change. Thus, the rationale in the usage of anti-epileptics in appropriate situations is evident.