

## A Study on the Drug Utilization Evaluation of Antiepileptics among the Pediatric Patients at an Indian Tertiary Care Hospital

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### ABSTRACT

**Aim:** The main of the study is to evaluate the drug utilization pattern of antiepileptics among the pediatric patients at an Indian tertiary care hospital.

**Materials and Methods:** This was a prospective study. In-patients who were having seizures with infant (1 month - 2 years), children (2-12 years) and adolescent (12-16 years) age groups were included in this study. Out-patients and patients with brain tumors were excluded from the study.

**Results:** A total of 200 study participants were involved in this study and among them, 117 (58.5%) were found to be males and 83 (41.5%) were found to be females. Among the 200 study participants, 149 (74.5%) were prescribed with monotherapy, 38 (19%) were prescribed with dual therapy, 9 (4.5%) were prescribed with triple therapy and the remaining 4 (2%) were prescribed with other combinations. Among the study participants who were prescribed with monotherapy, Phenytoin (41.6%) was the most commonly prescribed drug followed by clobazam (24.8%) and sodium Valproate (23.5%). Phenytoin + benzodiazepine (42.1%) and sodium Valproate + benzodiazepine (31.6%) were the most commonly prescribed dual therapy drugs in this study. Sodium Valproate + Phenytoin + Levetiracetam (33.4%) and Phenytoin + Sodium Valproate + Clobazam (22.2%) were the most commonly prescribed triple therapy drugs in this study.

**Conclusion:** Majority of the patients were prescribed with monotherapy followed by dual therapy. Phenytoin was the most commonly prescribed drug in monotherapy whereas the combination of Phenytoin+benzodiazepine was the most commonly prescribed among the patients prescribed with dual therapy. Clinical pharmacists should involve in providing better pharmaceutical care and their involvement can improve the treatment outcomes and as well as the patient's quality of life.

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### Introduction

A seizure represents the uncontrolled, abnormal electrical activity of the brain that may cause changes in the level of consciousness, behavior, memory or feelings. It is usually diagnosed after a person has had at least two seizures or one seizure with the likelihood of occurring again, that were not caused by some known medical condition. The seizures in epilepsy may be related to a brain injury, genetics, immune, brain structure, metabolic cause or a family tendency, but most of the time the cause is unknown [1]. There are 65 millions of people around the world who have epilepsy. Between 4 and 10 out of 1,000 people on earth live with active seizures at any given time. The cause is unknown in 6 out of 10 seizure cases and almost 33 % of the patients with epilepsy suffer from uncontrollable seizures because no available treatments work for them [2,3]. The main aim of this study is to evaluate the drug utilization pattern of antiepileptics among the pediatric patients.

### Materials and Methods

This was a prospective study conducted in the department of Pediatrics of Government General Hospital (GGH) at Kakinada, East Godavari district of Andhra Pradesh. Patients who are having seizures with infant (1 month - 2 years), children (2-12 years) and adolescent (12-16 years) age groups were included in this study [4]. Out-patients and patients with brain tumors were excluded from the study. Data collection was done that includes details like patient's demographics, type of seizure, comorbidities and the treatment given to the patient [2,3].

### Results

A total of 200 study participants were involved in this study and among them, 117 (58.5%) were found to be males and 83 (41.5%) were found to be females (figure 1). According to the age wise categorization, most of the patients were children (56%) with 2-12 years age group followed by infants (36%) and adolescents (8%) (figure 2).

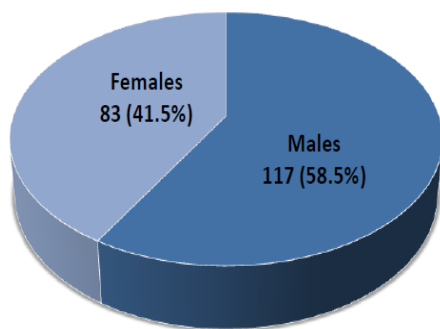


Figure 1: Gender wise categorization of the study participants

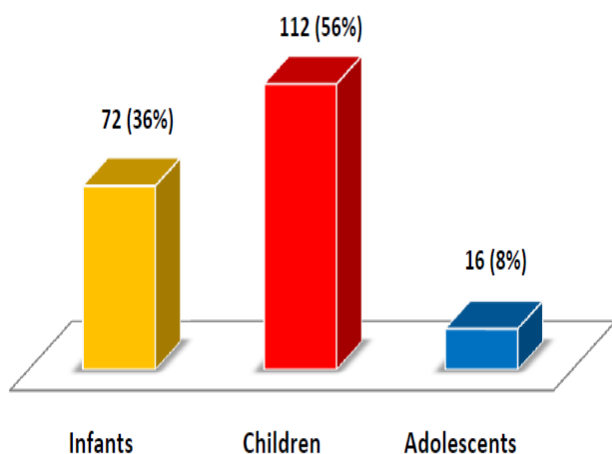


Figure 2: Age wise categorization of the study participants

Table 1 represents the type of seizures observed among the study participants. More than half of the study participants (50.5%) were observed with unclassified seizures. About 29% were observed with febrile seizures, 6.5% were observed with generalized tonic clonic seizures, 7.5% were observed with status epilepticus, 4.5% were observed with focal/partial seizures and the remaining 2% were observed with absence seizures.

Table 1: Various types of seizures observed among the study participants

Seizure type	No. of Patients (%)
Febrile seizures	58 (29)
Generalized tonic clonic seizures	13 (6.5)
Status epilepticus	15 (7.5)
Focal/ partial seizures	9 (4.5)
Absence seizures	4 (2)
Unclassified seizures	101 (50.5)
<b>Total</b>	<b>200 (100)</b>

Table 2 represents the co-morbidities of the study participants involved in the study. Fever (31.5%), global development delay (10%), respiratory tract infections (8%) and meningitis (5.5%) were the most commonly observed co-morbidities among the study participants. About 35.5% of the study participants were not observed with any kind of co-morbidities in their study.

Table 2: Co-morbidities observed among the study participants

Co-Morbidities	No. of Patients (%)
Fever	63 (31.5)
Meningitis	11 (5.5)
Tuberculosis	4 (2)
Syncope	2 (1)
Respiratory tract infections	16 (8)
Dengue	2 (1)
Cerebral malaria	1 (0.5)
Palsy	2 (1)
Hydrocephalus	3 (1.5)
Neurocysticercosis	5 (2.5)
Global development delay	20 (10)
None	71 (35.5)
<b>Total</b>	<b>200 (100)</b>

Among the 200 study participants, 149 (74.5%) were prescribed with monotherapy, 38 (19%) were prescribed with dual therapy, 9 (4.5%) were prescribed with triple therapy and the remaining 4 (2%) were prescribed with other combinations. In this study, most of the study participants were prescribed with monotherapy (74.5%) and this result was similar to the study done by Nalluri KK (2016) and Dwajani S et al (2019) [5,6].

Table 3 represents the frequency of the study participants prescribed with mono therapy. Among the study participants who were prescribed with monotherapy, Phenytoin (41.6%) was the most commonly prescribed drug followed by clobazam (24.8%) and sodium Valproate (23.5%).

Table 3: Frequency of the study participants prescribed with mono therapy (N=149)

Mono Therapy	No. of Patients (%)
Clobazam	37 (24.8)
Phenytoin	62 (41.6)
Sodium valproate	35 (23.5)
Levetiracetam	7 (4.7)
Midazolam	5 (3.3)
Diazepam	1 (0.7)
Carbamazepine	1 (0.7)
Phenobarbitone	1 (0.7)
<b>Total</b>	<b>149 (100)</b>

Table 4 represents the frequency of the study participants prescribed with dual therapy. Phenytoin + benzodiazepine (42.1%) and sodium Valproate + benzodiazepine (31.6%) were the most commonly prescribed dual therapy drugs in this study.

Table 4: Frequency of the study participants prescribed with dual therapy (N=38)

Dual Therapy	No. of Patients (%)
Phenytoin + Sodium Valproate	7 (18.4)
Phenytoin + Levetiracetam	3 (7.9)
Sodium Valproate + Benzodiazepine	12 (31.6)
Phenytoin + Benzodiazepine	16 (42.1)
<b>Total</b>	<b>38 (100)</b>

Table 5 represents the frequency of the study participants prescribed with triple therapy. In this study, very few study participants (4.5%) were prescribed with triple therapy. Sodium Valproate + Phenytoin + Levetiracetam (33.4%) and Phenytoin + Sodium Valproate + Clobazam (22.2%) were the most commonly prescribed triple therapy drugs in this study.

**Table 5: Frequency of the study participants prescribed with triple therapy (N=9)**

Triple Therapy	Total (%)
Phenytoin+Sodium Valproate+Clobazam	2 (22.2)
Sodium valproate+Phenytoin+ Levetiracetam	3 (33.4)
Sodium valproate+ Levetiracetam+Clobazam	1 (11.1)
Phenytoin+Clobazam+Midazolam	1 (11.1)
Midazolam+Phenytoin+Sodium Valproate	1 (11.1)
Phenytoin+Sodium Valproate+ Levetiracetam	1 (11.1)
<b>Total</b>	<b>9 (100)</b>

## Conclusion

Majority of the patients were prescribed with monotherapy followed by dual therapy. Phenytoin was the most commonly prescribed drug in monotherapy whereas the combination of Phenytoin + Benzodiazepine was the most commonly prescribed among the patients prescribed with dual therapy. Clinical pharmacists should involve in providing better pharmaceutical care and their involvement can improve the treatment outcomes and as well as the patient's quality of life.

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## Conflicts of Interest

Nil

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None

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