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Relationship between antiepileptic medications and type of seizures

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Abstract

Background: Seizure is one of the most common disorder in children and anti epileptics vary depending on the type of seizures occurring.

Methods: In total 50 children of age between 1-12 years requiring anti epileptics for seizure are taken into consideration and compared. Seizure mimicking disorder were excluded from this study.

Results: Among the 50 patients, valproate was predominantly used for generalized seizures followed by combination therapy of valproate and phenytoin followed by phenytoin and Levetiracetam. For focal seizures, carbamazepine was used predominantly.

Discussion: The initial evaluation based on history and examination for the type of seizures is important for pediatrician to assess the type of anti epileptic used.

Conclusion: Valproate and phenytoin are mostly used for generalized type of seizures while carbamazepine is used for focal type of seizures.

Keywords: Sodium valproate, phenytoin, Carbamazepine.

Introduction

A seizure is a transient occurrence of signs and symptoms resulting from abnormal excessive or synchronous neuronal activity in the brain. Epilepsy is a disorder of the brain characterized by an enduring predisposition to generate seizures and by the neurobiologic, cognitive, psychological and social consequences of this condition. The management of epilepsy is primarily based on use of anti-epileptic drugs. Surgery and diet therapy are the other modes of treating childhood seizures.

This condition is common in the paediatric age group and occur with a frequency of 4-6 cases per thousand children. Epilepsy, particularly antiepileptic drugs are of two categories namely conventional drugs like sodium valproate, carbamazepine, phenobarbitone, phenytoin sodium and newer drugs like topiramate, lamotrigine, oxcarbazepine etc. Adjuvant drugs like benzodiazepines are also used in this treatment.

Materials and Methods

Study Center:

The study was conducted at Rajah Muthiah Medical College and Hospital, Chidambaram.

Study Population

50 children were included in the study.

Duration of Study

January 2019 to May 2020.

Type of Study

Prospective observational study.

Inclusion Criteria

Children aged 1-5 years with a clinical diagnosis of seizure and children who are already a known case of seizure disorder on atleast one antiepileptic and required venipuncture for blood sampling were included in the study after getting informed parental consent.

Exclusion Criteria

- Movement disorders
- Non epileptic events.

Methodology

This prospective observational study was conducted among children attending Pediatric neurology outpatient department at Rajah Muthiah Medical College, Chidambaram in Tamilnadu. Children of both sexes fulfilling the inclusion criteria will be enrolled into the study after getting written informed consent from the parents/guardian. A thorough history and detailed examination of each child was carried out according to the proforma enclosed. All the

patients medical details was recorded on the proforma sheet. All the patients in the study group were given anti epileptics based on the history and clinical examination.

Results

Among the children with Generalized tonic-clonic seizure 9 (56.3%) were on Valproate treatment, 3 (18.8%) were on Valproate+ Levipil treatment, 4 (25%) were on Valproate+ Phenytoin. Among the children with Generalized clonic seizure 3 (37.5%) were on Phenytoin treatment, 5 (62.5%) were on Valproate treatment. Among the children with focal clonic seizure 4 (100%) were on Carbamazepine treatment. Among the children with Generalized tonic seizure 5 (83.3%) were on Valproate treatment. (Table 1)

Table 1: Relationship between antiepileptics & seizures.

ILAE classification	Treatment given					
	Carbamazepine	Levipil	Phenytoin	Valproate	Valproate+Levipil	Valproate+Phenytoin
Generalized tonic-clonic (N=16)	--	--	--	9 (56.3%)	3 (18.8%)	4 (25%)
Generalized clonic (N=8)	--	--	3 (37.5%)	5 (62.5%)	--	--
Generalized myoclonic (N=4)	--	1 (25%)	2 (50%)	1 (25%)	--	--
Generalized myoclonic-atonic (N=1)	--	--	1 (100%)	--	--	--
Generalized myoclonic tonic-clonic (N=2)	--	--	--	2 (100%)	--	--
Typical absence (N=2)	--	--	--	2 (100%)	--	--
Epileptic spasms+(N=1)	--	--	--	1 (100%)	--	--
Focal atonic (N=1)	1 (100%)	--	--	--	--	--
Focal clonic (N=4)	4 (100%)	--	--	--	--	--
Focal myoclonic (N=2)	2 (100%)	--	--	--	--	--
Focal tonic (N=1)	1 (100%)	--	--	--	--	--
Generalized tonic (N=6)	--	--	1 (16.7%)	5 (83.3%)	--	--
Generalized atonic (N=2)	--	1 (50%)	--	1 (50%)	--	--

Discussion

Relationship Between type of Seizures & Anti Epileptics

Most children with new onset epilepsy achieve seizure freedom with appropriate antiepileptic drugs. However, nearly 20% will continue to have seizures despite AED's, as either monotherapy or in combination. In our study population, GTCS children was treated with 56.3% valproate & 25% with valproate plus phenytoin which was contradicting to the study by Nolan SJ *et al.* [1] which says no significance between GTCS & valproate therapy and Nevitt SJ *et al.* [2] supports sodium valproate is more effective for GTCS whereas in our study generalized clonic seizure was treated with 62.5% valproate & 37.5% phenytoin where as absence seizure was treated with valproate (100%) only which was also supported by Tracy A Glauser *et al.* [3] which also states that valproate are more effective than lamotrigine in the treatment of absence seizures.

In our study with focal seizures, carbamazepine (100%) was the treatment of choice including focal myoclonic, focal atonic seizures which was also supported by Guerrini *et al.* concluding that carbamazepine is the first line of choice of drug for focal epilepsy and also stating that carbamazepine should be avoided in absence & myoclonic seizure as these conditions may be exacerbated by the drug, also supporting our study.

Table 2: Relation between type of seizure & antiepileptics

Treatment given	Present study	
	G	F
Valproate	52%	--
Carbamazepine	--	100%
Phenytoin	14%	--
Levitracetam	4%	--
Valproate +phenytoin	25%	--

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