



CORRELATION BETWEEN TYPE OF SEIZURES AND STRUCTURAL ABNORMALITIES OF BRAIN

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ABSTRACT

INTRODUCTION : In developing countries epilepsy is an important health problem. Epilepsy is a complex neurological condition with many possible co-morbid features. The risk of premature death is two to three times higher in epileptic children. Neuroimaging becomes important and mandatory in the work up of epilepsy and for classification of the seizure focus. The correlation of structure with function is essential in the understanding of the epilepsies and epileptic seizures, which may have a structural basis.

AIM/OBJECTIVE:- To study the type of intracranial lesions responsible for the epilepsy. And To study the correlation between type of seizures and pattern of structural abnormalities of brain.

MATERIAL & METHOD:- All children between age of 1 month to 18 years with two or more unprovoked seizures attending the paediatrics emergency and OPD of SAMC & PGI in 1½ year duration were enrolled in the study. Detailed history and clinical examination was done for all the patients included in the study. And neuroimaging(CT/MRI) was also done in all patients.

RESULT:- In our study out of 144 patients, In cases of perinatal insult, Partial seizures were found in 28 cases out of which 22 were of Partial to Generalized Tonic- Clonic Seizure (PGTC) and 6 were of Complex Partial Seizure (CPS). 12 cases of perinatal insult were unclassified. In infective sequelae, 24 were of partial, out of which 12 of PGTC, 8 of Simple Partial Seizure (SPS), 4 of CPS. In congenital/developmental anomaly, 22 were of partial out of which 14 were of PGTC, 6 were of CPS, 2 was of SPS. Two cases of congenital anomaly was of generalized seizures

CONCLUSION:- The study shows that partial seizures are more common than generalized seizures irrespective of etiology.

KEYWORDS : Partial seizures, Neuroimaging, perinatal insult, CT/MRI Brain

INTRODUCTION

Epilepsy is a major and important health problem in developing countries. The international classification of epileptic seizures and epileptic syndromes defined epileptic syndrome in 1985/1989⁽¹⁾ as an epileptic disorder characterized by a cluster of signs and symptoms customarily occurring together. Epilepsy is characterized by its episodic and chronic nature. The seizures usually produce brief periods of disruption, which include phenomena such as loss of consciousness, bodily distortion, injuries, unusual and often frightening psychological experiences as well as urinary and bowel incontinence. Epilepsy is a complex neurological condition with many possible co-morbid features.⁽²⁾ In developed countries, annual new cases are between 40 to 70 per 100000 people in the general population and in developing countries, this figure is often close to twice. Much progress has been made over the last 15 years in the structural and functional imaging of the brain in epilepsy. The correlation of structure with function is essential in the understanding of the epilepsies and epileptic seizures, which may have a structural basis.⁽³⁾ The Neuroimaging Commission of the International League Against Epilepsy has produced recommendations for neuroimaging in patients with epilepsy. The rationale for imaging the brains of patients developing epilepsy is first to identify underlying pathologies such as vascular lesions, infections and tumours that require specific therapy; and second to assist the formulation of syndrome and etiological diagnoses⁽⁴⁾.

Aim & Objective

To study the type of intracranial lesions responsible for the epilepsy.

To study the correlation between type of seizures and pattern of structural abnormalities of brain.

MATERIAL & METHOD

The study was a prospective observation study approved by the ethical committee of Sri Aurobindo medical college and Post graduate Institute, Indore (M.P.), and an informed written consent was obtained from parents of each patient. The present study was conducted in the Department of

paediatrics. It was a 1½ year duration study in which 144 patients were taken for study and were selected from paediatrics OPD and emergency. Detailed history with Complete neurological examination was carried out in all the patients. The type of seizure was determined from the description of the seizures given by the eye witness and were classified electro clinically using the 1985/89 International League Against Epilepsy (ILAE). Neuroimaging study was done in all patients.

Inclusion criteria:

Any child between age of 1 month-18 year with two or more unprovoked seizures and has undergone neuroimaging i.e. CT/MRI Brain.

Exclusion criteria:

- Children with
1. Febrile seizures.
 2. Acute symptomatic seizures.
 3. Progressive neurological disorders.
 4. Who could not undergo neuroimaging.

RESULT

A total of 144 cases aged between one month to eighteen years of both genders visiting OPD and emergency of paediatrics department were taken. The **table-1** shows the age and sex distribution of the patients. Almost equal age distribution was there in the different age groups. In our study 54.16% of children were male and 45.83% were female

Table No. 1 Age / sex distribution of patients studied

Age Group	Male	Female	Total No. of Patients
	No.	No.	
1 months – 3 years	28	8	36(25%)
4 years – 6 years	12	22	34(23.61%)
7 years – 9 years	18	14	32(22.22%)
10 years – 12 years	14	8	22(15.27%)
13 years -18 years	6	14	20(13.88%)
Total	78(54.16%)	66(45.83%)	144(100%)

Table No. 2 Types of Seizure

	Total No. of Patients	Percentage
Partial	104	72.22%
SPS (simple partial seizure)	14 (13.46%)	
CPS (complex partial seizure)	16 (15.38%)	
PGTC (partial to generalized tonic- clonic seizure)	74(71.15%)	
Generalized	12	8.33%
GTC (generalized tonic- clonic seizure)	8(66.66%)	
Myoclonic	2(16.66%)	
Infantile spasms	2(16.66%)	
Unclassified	28	19.44%
Total	144	100%

In our study partial seizures were seen in 72.22% of the patients, out of that 13.46% had SPS, 15.38% had CPS, 71.15% had PGTC. Generalized seizures were seen in 8.33%, out of which other than GTCS in 8 , myoclonic seizures was present in 2 and 2 had infantile spasms. 19.44% of the patients had unclassified seizures. (Table-2)

Table No. 3 Etiology of Symptomatic Epilepsy

Etiology of Symptomatic Epilepsy	Total No. of Patients	Percentage
Perinatal insults	40	40.81
• Cystic encephalomalacia	2	
• Porencephalic cyst	4	
• Cortical atrophy	12	
• Gliosis	18	
• PVL	4	
Infective sequelae	26	26.53
• NCC	24	
• tuberculoma	2	
Vascular		2.04
• MCA infarct	2	
Congenital/developmental	24	24.48
• Tuberous sclerosis	6	
• Cortical dysplasia	8	
• Hydrocephalus	2	
• Callosal agenesis	6	
• Cavernous angiomas (Sturge Weber Syndrome)	2	
Miscellaneous	6	6.12

In our study, out of 144 patients 98 had some abnormality in neuroimaging study. And in our study, Neuroimaging findings suggestive of perinatal insult were seen in 40.81% of patients. It was followed by infective sequelae in 26.53% of cases which includes mainly NCC. Congenital/developmental anomaly was observed in 24.48% of cases followed by vascular in 2% and miscellaneous in 6.12%..(Table-3)

Table No. 4 Distribution of type of seizures in different etiologies

	Perinatal	Infective	Congenital/developmental	Vascular	Miscellaneous	P value
Partial	28	24	22	-	2	0.0147
Generalized	-	-	2	-	2	
Unclassified	12	2	-	2	2	

In our study 98 patients were having neuroimaging abnormality. Out of these, In cases of perinatal insult, Partial seizures were found in 28 cases out of which 22 were of PGTC and 6 were of CPS. 12 cases of perinatal insult were unclassified. In infective sequelae, 24 were of partial, out of which 12 of PGTC, 8 of SPS, 4 of CPS. In congenital/developmental anomaly, 22 were of partial out of which 14 were of PGTC, 6 were of CPS, 2 was of SPS. 2 cases of congenital anomaly were of generalized seizures.

DISCUSSION

This study was conducted in Department of paediatrics, SAIMS & PG Institute, Indore, (M.P). A total of 144 subjects were included in the study and only 98 patients had abnormal neuroimaging study.

In our study we found that Partial seizures were more commonly found than generalized ones in almost all the categories. In present study we found that out of total 98 cases, cases due to perinatal insult were found in 40. In case of these 40 patients of perinatal insult, Partial seizures were found in 28 cases out of which 22 were of PGTC and 6 were of CPS and 12 cases of perinatal insult were unclassified. In infective sequelae (total 26patients), 24 were of partial, out of which 12 of PGTC, 8 of SPS, 4 of CPS. In congenital/developmental anomaly (total 24 patients), 22 were of partial out of which 14 were of PGTC, 6 were of CPS, 2 was of SPS. 2 cases of congenital anomaly were of generalized seizures.

These findings are suggestive of that partial seizures were more commonly found than generalized ones in almost all the categories of seizures irrespective of structural abnormality of brain and etiology. Similar observation was made in some other studies done by Zarrelli MM et al⁽⁵⁾ and Shinnar s et al⁽⁶⁾ in 1999 and Freitag CM et al⁽⁷⁾ in 2004. In their studies they also found partial seizures were more commonly found than generalized seizures. But Mohamed Y et al in 2009 found in their study that generalized seizures were more common than partial seizures.⁽⁸⁾

CONCLUSION

The purpose of this study was evaluation of the spectrum of intracranial structural abnormalities in children with epilepsy as diagnosed by Neuroimaging.

It has been found that partial seizures are more common than generalized seizures irrespective of etiology and structural lesion of brain.

From the above findings we conclude that partial seizures are commonly found in paediatric population followed by secondary generalization and neuroimaging study is helpful for classification of seizure type and syndrome. And this is helpful for starting a stepwise treatment strategy for childhood epilepsy.

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