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CORRELATION BETWEEN AGE OF ONSET OF SEIZURES AND STRUCTURAL ABNORMALITIES OF BRAIN

paediatrics

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ABSTRACT

INTRODUCTION : Epilepsy is a global health problem but more important in developing countries. Epilepsy is an important cause of seizures in paediatric age group. The risk of premature death in people with epilepsy is two to three times higher than it is for the general population. Neuroimaging is an important and mandatory in the work up of epilepsy. The incidence of epilepsy is highest in first year of life and falls dramatically between one and ten years of age.

AIM/OBJECTIVE:- To study the correlation between age of onset of seizures and 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, Majority (68.05%) of the patients had onset of seizures before six years of age. In case of perinatal insult, seizures started in first three years of life in most of the patients. While in case of Neurocysticercosis (NCC), age of onset of seizures was seen in slightly higher age group. In Congenital /developmental anomaly, onset of seizures was seen in early age group.

CONCLUSION:- The study shows that In cases of perinatal insult, onset of seizures was in first three years of life. While in cases of NCC, onset was seen in slightly higher age group.

KEYWORDS

Neuroimaging, perinatal insult, NCC, CT/MRI Brain

INTRODUCTION

Epilepsy is a global health problem but more important 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. The factors used to define syndromes were clinical such as case history, seizure type, modes of seizure occurrence, neurological findings, psychological findings, and findings detected by ancillary studies (CT scan and MRI). Epilepsy is characterized by its episodic and chronic nature. The risk of premature death in people with epilepsy is two to three times higher than it is for the general population.[2] The estimated proportion of the general population with active epilepsy (i.e. continuing seizures or the need for treatment) at a given time is between 4 to 10 per 1000 people. However, some studies in developing countries suggest that the proportion is between 6 to 10 per 1000. Around 50 million people in the world have epilepsy.[2]The incidence of epilepsy is highest in first year of life i.e. around 120 per 100,000[3] and falls dramatically between one and ten years of age to 40-50 per 100,000[3].

AIM & OBJECTIVE

To study the correlation between age of onset of seizures and 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 1 ½ 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. 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

Table No. 1Age / 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%)

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. 2 Age of Onset of Seizures

Age of Onset of Seizures	Total No. of Patients	Percentage
1 mon – 3 years	70	48.61%
4 years – 6 years	28	19.44%
7 years – 9 years	14	9.72%
10 years – 12 years	18	12.5%
13 years -18 years	14	9.72%
Total	144	100%

In our study we found that 70 patients (48.61%) had seizures before 3 years of age, 28 patients (19.44%%) had seizures between 4 to 6 years of age, 14 (9.72%%) between 7 to 9 years of age, 18 (12.50%%) between 10 to 12 years of age and 14 (9.72%%) between 13 to 18 years of age. So majority (68.05%) of the patients had onset of seizures before six years of age. Mean age of onset of seizures was 5.2 ± 4.4 years..(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 sequalae • NCC • Tuberculoma	26 24 2	26.53
Vascular • MCA infarct	2	2.04
Congenital/developmental • Tuberous sclerosis • Cortical dysplasia • Hydrocephalus • Callosal agenesis • Cavernous angiomatosis (Sturge Weber Syndrome)	24 6 8 2 6 2	24.48
Miscellaneous	6	6.12

In our study Neuroimaging findings suggestive of Perinatal insult was seen in 40.81% of patients. It was followed by infective sequalae 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 between different etiologies and age of onset of seizures

Age of Onset of Seizures	Perinatal insults	Infective sequalae	Congenital/ developmental	Vascular	Miscellaneous
1 mon– 3 years	34	2	18	2	-
4 years – 6 years	4	4	2	-	-
7 years – 9 years	2	8	2	-	4
10years-12 years	-	6	2	-	2
13years-18 years	-	6	-	-	-
Total	40	26	24	2	6

In our study of 144 patients only 98 had abnormality in neuroimaging study. So out of 98 patients, in case of perinatal insult (40 patients), seizures started in first three years of life in 34 patients (85%). While in case of NCC (26 patients), age of onset of seizures was seen in slightly higher age group and majority of them was beyond 7 years of life. In Congenital /developmental anomaly (24 patients), in 18 patients (75%) onset of seizures was seen in first three years of life.

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. Out of which neuroimaging was abnormal in 98 patients.

In our study, mean age of onset of seizures was 5.2 ± 4.4 year. And out of 144 patients, in 68.05% of the children seizures started before six years of age. Aggarwal et al[4] at Kalawati Saran children Hospital found 64.19% of the children as having onset before six years of age. In another study by Paola Scarpa and Bruno Carassini[5] on symptomatic epilepsy the age of onset of seizures was found to be less than five years in 46.7% of the cases.

In our study,we also found that in cases of perinatal insult, onset of seizures was in first three years of age. In NCC, it was seen in slightly higher age group. In cases of congenital/developmental anomaly, it was seen in early age group. Leventer RJ et al in 2008 also found that children with congenital anomaly have early onset seizures.[6] Bhattacharjee S et al in 2013 also found that patients with NCC had seizures between 10 to 14 years of age.[7] And Amudhan S et al in 2015 also found that in cases of perinatal insult seizures onset was in first 2 years of age.[8] So our finding was comparable with other study.

These findings are suggestive of that with perinatal insult and congenital anomalies, seizures onset occurs at early age as compare to NCC cases. We also found that majority of children developed seizures before six years of age.

CONCLUSION

Epilepsy has got highest incidence in two extremes of life, in younger age group as well as in elderly individuals. In children the age of onset of epilepsy plays a significant role in assessing the intractability of seizures. The seizures can be intractable when the age of onset is in early years of childhood.

The purpose of this study was evaluation of risk factor for early onset epilepsy and to find out the average age of onset of seizures.

It has been found that majority of children having epilepsy onset before six year of age. And perinatal insult and congenital/developmental anomaly are the most common causes of early onset seizures followed by NCC. But NCC has seizures onset at later age as compare to perinatal insult.

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