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ETIOLOGICAL DISTRIBUTION OF SEIZURES IN CHILDREN

Paediatrics

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ABSTRACT

INTRODUCTION: Seizures are the most common pediatric neurologic disorder, accounting 4% to 10% of children suffering at least one seizure in the first 16 years of life. Worldwide, febrile seizures are the most common type of seizures in children. When seizures in children present with no apparent cause or with suspicion of CNS infection, clinical criteria with the advent of CSF analysis, EEG, neuroimaging techniques are helpful. It is important to identify the cause so that appropriate treatment is instituted at the earliest.

AIM AND OBJECTIVES: To determine the distribution of type of seizures and etiology of seizures in children, with the aid of investigations wherever needed.

MATERIALS AND METHODS: A hospital based cross sectional study done at Navodaya medical college hospital and research Centre during 2020 January to 2021 June for a period of 12 months. Data is described in the terms of frequencies and percentages. Statistical analysis done using SPSS software version 26.

RESULTS: Out of 140 children presented with seizures, majority were febrile seizures 48(34.29%), followed by CNS infections 33(23.57%), space occupying lesions 20(14.29%), epilepsy 19(13.57%), unidentifiable 15(10.71%) and other causes 5(3.57%).

CONCLUSIONS: Generalized seizures are more common in younger children whereas focal seizures in older children. Other than febrile seizures, clinical criteria with the advent of investigations useful in identifying etiology of which most commonly associated with focal seizures. After identifying cause, most of the seizures can be controlled by monotherapy with specific antiepileptic drugs.

KEYWORDS

Children, CNS Infection, Etiology, Investigations, Seizures.

INTRODUCTION

A seizure is an abnormal, unregulated electrical discharge of nerve cells in the brain or part of the brain. This abnormal electrical discharge can cause convulsions, involuntary movements, altered awareness and abnormal sensations. Convulsions are violent, involuntary, rhythmic contractions of the muscles that affect a large part of the body. If a child has 2 or more seizures with no known cause, this is diagnosed as Epilepsy.[1]

Seizures are the most common pediatric neurologic disorder, with 4% to 10% of children suffering at least one seizure in the first 16 years of life.[2] The incidence is highest in children younger than 3 years of age, with a decreasing frequency in older children.[3] When seizures in children present with no apparent cause or with suspicion of CNS infection, clinical criteria with the advent of CSF analysis, EEG, neuroimaging techniques are helpful.[4] It is important to identify the cause so that appropriate treatment is instituted at the earliest.[5] The prevalence rate is 5.59 per 1000 population with no gender or geographical differences.[6]

Aims And Objectives:

1) To determine the distribution of type of seizures
2) To identify the etiology of seizures
3) To correlate seizures characteristics with EEG, CT/MRI brain.T o correlate seizures characteristics with EEG, CT/MRI brain.

Materials And Methods

A hospital based cross sectional study done at Navodaya medical college hospital and research Centre during 2020 January to 2021 June for a period of 12 months Data is described in the terms of frequencies and percentages. Statistical analysis done using SPSS version 26.

Inclusion Criteria: Children of either sex who presented with history of seizures with any etiology and those who are willing to participate in the study.

Exclusion Criteria: 1. Neonates with doubtful seizures, 2. Seizure cases who expired immediately after hospitalization (before diagnosis), 3. Not willing to give consent.

RESULTS

The study was a hospital based cross sectional observational study conducted on children of age group 1 month to 18 years admitted to the Department of Pediatrics, Navodaya Medical college Hospital and Research Centre, Raichur. A total number of 140 children were included in the study.

TABLES

TABLE 1:Incidence of convulsions in different age groups

Age Group	No. of Cases	Percentage
1month – 3 yrs.	68	48.57
4 yrs. – 6 yrs.	39	27.86
7 yrs. – 12 yrs.	21	15.00
13 yrs. – 18yrs	12	8.57
Total	140	100

Table 1 shows the incidence of convulsions in different age groups. Occurrence of convulsions was highest 68 cases (48.57%) in the age group between 1 month to 3 years in the present study.

Table 2: Gender Wise Distribution Of Seizures

Gender	No of Cases	Percentage
Male	79	56.4
Female	61	43.6
Total	140	100

Table II shows out of the 140 cases included in study, 79 (56.4%) were males and 61 (43.6%) were females. The overall male female ratio is 1.29: 1.

Table 3: Distribution Of Type Of Seizures

Type of seizures	No of cases	Percentage
Generalized	93	66.4
Focal	47	33.6

Total	140	100

Table 3: shows the type of seizures. In which maximum number of cases 93 (66.4%) were generalized seizures and 47(33.6%) cases of focal seizures were noted.

Table 4: Distribution Of Etiologies In Patients With Seizures

Etiology	Number(n=140)	Percentage (%)
Febrile seizures	**48**	**34.29**
Intracranial infections	**33**	**23.57**
Tuberculous meningitis	7	5.00
Pyogenic meningitis	9	6.43
Cerebral malaria	5	3.57
Viral encephalitis	12	8.57
Space occupying lesions	**20**	**14.29**
Neurocysticercosis	12	8.57
Tuberculoma	6	4.29
Brain Abscess	2	1.43
Epilepsy	**19**	**13.57**
Metabolic	**3**	**2.14**
Hypoglycaemia	2	1.43
Hypocalcaemia	1	0.71
Others: Hypertensive encephalopathy	**2**	**1.43**
Unidentifiable	**15**	**10.71**
TOTAL	**140**	**100**

Table 4: shows etiological distribution of 140 cases, majority were febrile seizures 48 (34.29%), followed by intracranial infections 33(23.57%), Space occupying lesions 20 (14.29%), Epilepsy 19 (13.57%), unidentifiable 15 (10.71%), metabolic 3 (2.14%), and others 2 (1.43%).

Table 5: Etiology In Relation To Age Group

Etiology	1m – 3yrs	4– 6 yrs	7-12 yrs	13 –18 yrs	Total
Febrile seizures	35	13	0	0	48
CNS infections					
Tuberculous meningitis	1	1	3	2	7
Pyogenic meningitis	4	3	1	1	9
Cerebral malaria	2	1	2	0	5
Viral encephalitis	5	4	2	1	12
Space occupying lesions					
Neurocysticercosis	2	3	4	3	12
Tuberculoma	0	1	3	2	6
Brain Abscess	0	1	1	0	2
Epilepsy	8	6	3	2	19
Metabolic					
Hypoglycemia	1	1	0	0	2
Hypocalcemia	0	1	0	0	1
others					
Hypertensive Encephalopathy	1	1	0	0	2
Unidentifiable	9	3	2	1	15
TOTAL	68	39	21	**12**	140

Table V shows etiology, in which febrile seizures more common in the age group of 1m-3yrs 35 (72.92%), CNS infections were more common in the age group of 1m-3yrs 12 (36.36%), space occupying lesions were more common in the age group of 7-12yrs 8 (40%), epilepsy more common in the age group of 1m-3yrs 8 (42.11%), unidentified more in the age group of 1m-3yrs 9 (60%).

DISCUSSION

A total of 140 children were presented with history of seizures, who were studied through detailed history, clinical examination and investigations. In the present study, the incidence of seizures was highest in the age group 1month to 3 years (48.57%) A survey done to know the prevalence of epilepsy by Udani V et al [7] found that the peak age of onset was around 1 year and 90% of the attacks occurred during the first three years. In a study done by Ayesha Abbasi et al,[8] in 186 cases, median age of children presented with seizure was 26 months.

Present study showed high occurrence in males 56.4%, compared to females 43.6%. The majority were generalized tonic clonic (66.4%) type seizures. The most common cause of convulsions were febrile seizures (34.29%) In studies by Rohit chib et al,[9] generalized tonic-clonic seizure was the most common seizure type (69.2%) followed by partial (19.2%) and Ayesha Abbasi et al,[8] common type of seizure was generalized 95 (51.1%), simple partial 6 (3.3%). EEG findings were abnormal in 59 cases (63.44%) out of 93 children performed, with high incidence in focal seizure group. In study done by Shinnar et al [10] EEG abnormality was observed in 42% of children. Among them 56% of children with partial seizure and 35% of children with generalized seizure had abnormal EEG and the difference was statistically significant.

Intracranial infections were observed more in 1m-3yr age group (36.3%) Among them viral meningoencephalitis was more (36.3%). Neuroimaging studies revealed abnormalities of which majority were neurocysticercosis 8.57% followed by tuberculoma which presented as focal seizures. In a study made by K K Locham et al [11] at Patiala 2008; out of total cases of neurocysticercosis, 20% of cases occur below 5 years and 80% above 5 yrs. In a study by Rohit chib et al, [9] out of 121 patients and most common abnormality was neurocysticercosis 33(12%).

Incidence of epilepsy was observed 13.57%; minor proportion of were with hypertensive encephalopathy 1.43%, hypoglycaemia 1.43%, and hypocalcaemia 0.71%. Etiology was unidentifiable in 10.71% of cases due to lack of specified investigations in conditions like inborn error of metabolism. Multicentric prospective study is required to identify cause regarding these conditions.

CONCLUSION

Generalized seizures are more common in presentation than focal seizures in younger age group of children. Febrile seizures are more common in younger age group whereas space occupying lesions are more common in older age group of children. In focal seizures neurocysticercosis is more common, followed by tuberculoma. EEG, CT/MRI are more useful in diagnosing focal seizures than generalized seizures. Most of the seizures can be controlled by monotherapy with antiepileptic drugs. The main limitation to this study was that it was a single hospital-based study. Hence, multicentric and community-based studies are needed to generalize the results in general population.

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