Original Research Article

Etiological study of seizures among paediatric age group (1-18 years) in tertiary care medical college hospital

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Abstract

Introduction: Seizure is a common problem evaluated in paediatric emergency departments. A seizure or convulsion is a paroxysmal, time limited change in motor activity and/or behaviour that results from abnormal electrical activity in the brain. In most of the studies, febrile seizures were reported to be the most common type seen in the paediatric population and account for the majority of seizures seen in children younger than 5 years of age. Better understanding of seizures in terms of clinical presentation and etiology is required not only for abortion of acute attack but also for long term control of epilepsy. **Materials and methods:** The present descriptive study was conducted in the department of paediatrics Sri Siddhartha medical college, Tumkur. **Results:** A total of 70 cases of seizure were admitted, out of which 40(57.1%) were males and 30(42%) were females. Out of these cases 30(42.9%), cases presented with seizure which were between the age group of 1-3 years followed by 1 month to 1 year 18(26%) cases. Out of the 70 cases, febrile seizures were the commonest cause of convulsions in our study 48(68.5%). **Conclusion:** Seizures are the commonest neurological presentation in children worldwide and they bring fear and anxiety to the caretakers. It can be made from our study that most of acute symptomatic seizures are caused by febrile seizures, CNS infections like meningitis and encephalitis, neurocysticercosis which can be prevented with improvement in health care facilities.

Key words: Seizures, Etiology, Fever, Children

Introduction

Seizure is a common problem evaluated in paediatric emergency departments [1]. A seizure or convulsion is a paroxysmal, time limited change in motor activity and/or behaviour that results from abnormal electrical activity in the brain [2]. Seizures account for about 1-2% of all emergency department visits [3]. In most of the studies, febrile seizures were reported to be the most common type seen in the paediatric population and account for the majority of seizures seen in children younger than 5 years of age [3-5]. Less than one third of seizures in children are caused by epilepsy, a condition in which seizures are triggered recurrently from within the brain. The manifestation of the seizure depends upon the threshold of the brain to manifest a clinical seizure. The age and neuro developmental maturity status determine the clinical manifestations and the type of seizure disorders encountered [6]. Although the outlook for most children with symptomatic seizures or those associated with epilepsy is generally good, seizures may signal a potentially serious underlying systemic or central nervous system disorder that requires thorough investigation and management [2].

These patients require aggressive stabilization, resuscitation and concurrent implementation of diagnostic testing, monitoring and pharmacological interventions [7]. Central nervous system infections are the main cause of seizures and acquired epilepsy in the developing world [5,8]. Geographical variations determine the common causes in a particular region. Acute seizures are common in meningitis, viral encephalitis and neurocysticercosis and in most cases

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are associated with increased mortality and morbidity, including subsequent epilepsy [9,12].

Better understanding of seizures in terms of clinical presentation and etiology is required not only for abortion of acute attack but also for long term control of epilepsy. Also several preventive measures need to be undertaken at community level so as to decrease the burden of epilepsy in the community. With this background in mind we carried out the present study to understand the etiological profile of seizures in pediatric patients.

Materials and Methods

Study design: The present study was a descriptive study done on 70 consecutive cases admitted to pediatric wards of Sri Siddhartha Medical College Hospital, Tumkur, to know the various etiologies of seizures.

Inclusion criteria: The children between the age group of 1 month to 18 years were included study.

Exclusion criteria: Children with progressive and non progressive chronic neurological disorder and seizure mimicking disorders such as breath holding spells, migraine, apnea, syncope, panic attacks are excluded from the study.

Method of collection of data: The history and examination findings of subjects who were included in the study were recorded in the preformed proforma designated for the study. Relevant investigations were done to diagnose the underlying cause of the seizure.

Statistical methods: As the present study is a descriptive study, no statistical analysis was done. All the data are expressed as percentages.

Results

A total of 70 cases of seizure were admitted, out of which 40 (57.1%) were males and 30 (42%) were females. Out of these cases 30 (42.9%), cases presented with seizure which were between the age group of 1-3 years followed by 1 month to 1 year 18 (26%). (Table-1)

Table-1: Age wise incidence of seizures.

Age Group	Number of cases	Percentage
1 month – 1 years	18	26%
1 year – 3 years	30	43%
3 years – 5years	13	19%
5 years - 7years	3	4%
7 years – 10 years	3	4%
10 years – 14years	2	3%
14 years – 18years	1	1%
Total	**70**	**100%**

In the present study 61cases (87.14%) of seizure were Generalised Tonic Clonic type, followed by 9 cases (13.86%) which were of focal seizures type. (table-2)

Table-2: Type of convulsion.

Type of convulsion	Frequency	Percentage
GTC	61	87.14%
Left focal seizures	6	8.57%
Right focal seizures	3	4.29%
Total	**70**	**100.00%**

The common presentation in this study with seizure was fever 55 cases (79%), followed by altered sensorium 6 cases and cough 6cases which amounts to 9% each. (table-3)

Table-3: Symptoms associated with convulsions.

Symptoms	Frequency	Percentage
Fever	55	79%
Altered sensorium	6	9%
Headache	6	9%
Cough	6	9%
Vomiting	2	3%
Lethargy	2	3%
Ear discharge	1	1%
Trauma	1	1%
Rash	2	3%
Total	**70**	**100%**

About 29(41%) cases had previous history of seizures and 41(59%) didn't have previous history and was the 1st episode. Only 6(8%) cases had family history of convulsion, 64(91%) didn't have any family history. Out of the 70 cases, febrile seizures the commonest cause of convulsions in our study 48(68.5%) cases. (Table-4)

Table-4: Etiology of seizure.

Etiology of seizures	Frequency	Percentage
Simple febrile seizures	32	45.71%
Atypical Febrile seizures	16	22.86%
Idiopathic epilepsy	6	8.57%
Neurocysticercosis	3	4.29%
Viral encephalitis	3	4.29%
Acute infarct (CVA)	2	2.86%
Bacterial meningitis	2	2.86%
Congenital TORCH infections	2	2.86%
Benign rolandic epilepsy	1	1.43%
Hypocalcemic seizures	1	1.43%
Trauma	1	1.43%
Tuberculoma	1	1.43%
Total	**70**	**100.00%**

Discussion

Seizures are the most common pediatric neurologic disorders, occurring in 10% of children [2]. A total of 70 consecutive cases admitted to the hospital with seizures, were studied. The incidence of seizures in our study was more in males, accounting to 40 cases (57.1%) while females were 30 cases (42.90%). One of the reasons for the above observation could be the reason that conditions like febrile convulsions are more common in males with a sex ratio varying between 1.4 to 1 and 1.2 to 1 [13].

Study done by Bhat B V et al showed that the male: female ratio was 1.46:.[14]. Another found that there was a male preponderance in cases with active epilepsy [15]. In our study we recorded the highest incidence of seizures in the age group of 1 year to 3 year 30 (43%), followed by 26% (26%) in the age group of 1month to 1 years and least between 14 year and 18 years, 1(1%). A survey done to know the prevalence of epilepsy, found that the peak age of onset was around 1 year and 90% of the attacks occurred during the first three years

[15]. Bhat B Vet al in his study of 256 cases of bacterial meningitis over a period of 8 years showed that 83.6% of the cases were < 3 years [14]. Ellenberg J H et al, revealed that the incidence of non febrile seizures was highest in the 1st year of life especially in the 1st month. Some study observed that younger the age at the onset of non febrile seizures of any type, the higher the incidence of symptomatic rather than idiopathic epilepsy [16].

In our study, we observed that the commonest seizure type was GTC 61(87.14%). The remaining 9(12.88%) patients had focal seizures of which left focal was in 6(8.5%) patients and right focal in 3(4.29%) patients. In the literature available it is noted that generalized tonic clonic, (GTC) seizures are the most common type of childhood seizures, occurring in almost 61% of cases [13]. Generalized epilepsies were twice as common as partial epilepsies in one community survey, possibly due to the over estimation as generalized tonic clonic seizures are more dramatic and more likely to be noticed [15].

In the present study of the total 70 cases, majority of the patients presented with fever 55(79%), altered sensorium 6(9%) and headache 6(9%). Cough 6(9%), Vomiting 2(3%), rash 2(3%) lethargy 2(3%), ear discharge 1(1%) and trauma 1(1%) were the other minor symptoms. Febrile seizures are due to febrile illnesses from common infections such as tonsillitis, upper respiratory infections, and otitis media [17]. In our study, most cases of febrile seizures were associated with symptoms of upper respiratory tract infection or acute gastroenteritis.

Of the 70 cases studied, 29(41.4%) had a past history of convulsions. The reason for this could be due to the fact that conditions like febrile seizures and epilepsy are known to have recurrent seizures. Study by Udani V et al showed the risk of recurrence is 25-30% in cases of febrile convulsions [15]. Annegers et al found a recurrence rate of 25. It was found that recurrence risk was highest for the infants in the first year of life (48%) and lowest for those who are 4 years of age (15%) [13].

In our study, 6(8.6%) of total cases had a family history of seizures. More than half of the patients studied by Watanabe et al had a family history of epilepsy or febrile convulsions. In a large series studied by Chevrie and Aicardi, a positive family history of seizures was present in 28% of infants with uncharacteristic seizures. The proportion of positive family history was higher in those with apparently generalized seizures than in those with partial seizures [13].

In our study, febrile seizures, bacterial meningitis were the major causes between 1 month to 1 year. Febrile seizures, viral encephalitis and bacterial meningitis had high incidence between 3 to 7 years, while febrile seizures and viral encephalitis were predominant causes between 1 to 5 years. In a large population based study in South Taiwan done by Huang CC, 63 children with acute symptomatic seizure disorder were identified. The leading causes of acute symptomatic seizures were acute gastroenteritis, encephalitis / encephalopathy and bacterial meningitis. Age specific incidence was highest in the group aged 1-12 months. Intracranial hemorrhage, bacterial meningitis and metabolic disturbances were the major causes of acute symptomatic seizures in children aged 1-12 months. Acute gastroenteritis, encephalitis / encephalopathy and bacterial meningitis accounted for 85% of the cases in children between 13-24 months. Encephalitis / encephalopathy were the predominant cause in those aged 25-36 months [18].

Conclusion

Seizures are the commonest neurological presentation in children worldwide and they bring fear and anxiety to the caretakers. It can be made from our study that most of acute symptomatic seizures are caused by febrile seizures, CNS infections like meningitis and encephalitis, neurocysticercosis which can be prevented with improvement in health care facilities.

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