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A STUDY ON ETIOLOGICAL EVALUATION OF CHILDREN AGED 2 MONTHS-12 YEARS WITH STATUS EPILEPTICUS ADMITTED IN A TERTIARY CARE HOSPITAL

Dr.Yamasani Nageswara Reddy[1*]

[1*]Associate Professor, Department of Paediatrics, Viswabharathi Medical College, Penchikalapadu, Kurnool, AP.

Corresponding Author: Dr.Yamasani Nageswar Reddy

Abstract

Introduction: A seizure is transient occurrence of signs and/or symptoms resulting from abnormal excessive or synchronous neuronal activity in the brain. Seizures are the commonest pediatric neurological problem, by themselves or as manifestation of many underlying problems. Status Epilepticus (SE) means that seizures continue for prolonged periods.

Materials and Methods: The study started with taking after giving informed consent followed by proper selection of infants of 2 months to 12 years old children who fitted in the operational definition of status epilepticus. Consents from parents of the children enrolled were taken. After initial management investigations sent were blood glucose, blood gas analysis haematological, biochemical and microbiological study of blood (Urine and CSF where needed), brain imaging (MRI brain, CT scan) Electroencephalogram (EEG).

Results: As per CSF for JE antibody findings 3(6.0%) patients had negative CSF and 4 (4.0%) had positive CSF. CSF for JE Antibody was not done for 90 (90.0%) patients. As per CSF antibodies to HSV 4(4.0%) patients had negative findings and 6(6.0%) had positive findings. CSF antibodies to HSV was not done for 90 (90.0%) patients.

Conclusion: Status epilepticus is a common neurological emergency in children. Management requires simultaneous resuscitation and medical stabilization, diagnosis of the underlying cause, and definitive rapid treatment. The mortality and morbidity associated with SE has decreased over the years due to a systematic approach and prompt management. Earlier the time frame for definition of status epilepticus was 30 minutes. But the use of operational definition of 5 mins., is helpful as it prevents brain damage. This was the reason for using the operational definition of 5 mins. In our study. As most of our patients presented with fever, control of fever is important in domiciliary setting.

Key Words: Seizure, neurological emergency, CSF, Electroencephalogram, brain imaging.

INTRODUCTION

A seizure is transient occurrence of signs and/or symptoms resulting from abnormal excessive or synchronous neuronal activity in the brain. Seizures are the commonest pediatric neurological

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problem, by themselves or as manifestation of many underlying problems. Status Epilepticus (SE) means that seizures continue for prolonged periods.[1]

The most common type of SE is convulsive status epilepticus (generalized tonic, clonic, or tonic-clonic), but other types do occur, including nonconvulsive status (focal with impaired awareness, absence), myoclonic status, epilepsia partialis continua, and neonatal status epilepticus.[2]

The incidence of SE ranges between 10 and 60 per 100,000 population in various studies. SE is most common in children younger than 5 yr of age, with an incidence in this age-group of > 100 per 100,000 children. Approximately 30% of patients presenting with SE are having their first seizure, and approximately 40% of these later develop epilepsy.[3]

It has been reported that the mortality is nearly 10-fold higher for seizure lasting 30 min or longer than for those lasting 10-29 min. The recognition and rapid treatment of seizures is important during acute illness.[4] The failure to diagnose status epilepticus leads to high mortality. Lately it is becoming increasingly recognized that seizure duration of more than 10 minutes can lead to brain damage and duration of seizure activity in definition of status epilepticus is being decreased. The longer the SE is present, more difficult is the control and more is the risk of permanent neurological damage.[5] Immediate intervention is important whenever the patient has SE. It is important to consider SE whenever a seizure activity or a series of seizure activity persist for more than 10 minutes or and to consider therapy.

MATERIALS AND METHODS

The study started with taking after giving informed consent followed by proper selection of infants of 2 months to 12 years old children who fitted in the operational definition of status epilepticus. Consents from parents of the children enrolled were taken. After initial management investigations sent were blood glucose, blood gas analysis haematological, biochemical and microbiological study of blood (Urine and CSF where needed), brain imaging (MRI brain, CT scan) Electroencephalogram (EEG).

Place of Study: Department of Paediatrics, Viswabharathi Medical College, Penchikalapadu, Kurnool, AP.

Duration of Study: 1 year (June 2022 to May 2023)

Study Design: Descriptive study.

Study Population: 2 months old infants-12 year's old children admitted with status epilepticus in our institution.

Sample Size: 100 patients.

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Inclusion Criteria

1. Age more than 2 months up to 12 years old children.

2. More than 5 minutes of continuous seizure or two discrete seizure with incomplete recovery of consciousness.

Exclusion Criteria

1. Pseudo seizure or seizure mimickers.

2. Children with head trauma.

3. Poisoning.

RESULTS

As per CSF for JE antibody findings 3(6.0%) patients had negative CSF and 4 (4.0%) had positive CSF. CSF for JE Antibody was not done for 90 (90.0%) patients. As per CSF antibodies to HSV 4(4.0%) patients had negative findings and 6(6.0%) had positive findings. CSF antibodies to HSV was not done for 90 (90.0%) patients.

Age group (in years)	Number	%
<1	8	8%
1-5	70	70%
6-10	22	22%
Total	100	100%

Table 1: Age distribution of patients

Gender	Number	%
Male	56	56%
Female	44	44%
Total	100	100%
Male : Female	1.3:1.0	

Table 2: Gender distribution

Chief complaints	Number	%
Fever with convulsion	76	76%
Unprovoked convulsions	14	14%
Fever with convulsion with altered consciousness	4	4%

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Repeated fall with loss consciousness	2	2%
Twisting of eyes with focal seizure with altered sensorium	2	2%
Unprovoked seizures with unable to move right hand and leg	2	2%

Table 3: Distribution according to chief complaints of the patients

Type of Seizure	Number	%
GTCS	74	74%
Focal	18	18%
Focal with secondary generalization	6	6%
NCSE	2	2%
Total	100	100%

Table 4: Distribution of according to type of Seizure of the patients

Duration of Seizure (in Minutes)	Number	%
<10	36	36%
10-19	40	40%
20-29	16	16%
30-35	8	8%
Total	100	100%

Table 5: Distribution according to duration of Seizure

DISCUSSION

The incidence of status epilepticus in our study was found to be 6.6 per 1000 paediatric patients admitted in our institution. In our study male female ratio was found to be 1.3:1. Murthy et al, in their study found that male to female ratio was 1.3:1. In a study conducted by Kumar M, Kumari R, Narain N it was found to be 1.5:1. There is a strong effect of age on the frequency and aetiology of SE, as well as on the type of child who has SE.[6]

In our study it was found to be 8% in less than 1-year age, 70% in the age group 1-5 years, 22% in the age group 6-10 years. Thus, status epilepticus was more prevalent in the age 1-5 years followed by 6-10 years. In a study conducted by Gulati et al it was seen that 56% patients were less than 2 years. The reason for this predominance of SE in younger children is not known. Probably, mechanisms for control of seizure activity are fragile in younger children and may get disrupted with minimal abnormalities in neuro function. The most common type of status epilepticus was found to be generalized tonic clonic convulsion (GTCS).[7]

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In our study it was found that GTCS was most common (74%) followed by focal (18%). In 2% cases non convulsive status epilepticus (NCSE) was found (Table 4). In a study conducted by Kumar M, Kumari R, Narain N, GTCS was observed in 91.4% of SE patients while 8.6% had partial SE.[8]

Paediatric SE is divided into three categories: initial SE (20-30 min), established SE (30-60 min) and refractory SE (>60 min). In our study it was found that in 36% cases duration was less than 10 mins, in 56% it was 10-30 mins, while in 8% cases it was more than 30 mins., (Table 5). In a study conducted by Saz EU, Karapinar B, it was observed that in 30% of the children episodes lasted for 20-30 mins., in 37% the duration was between 30-60 mins., while 33% had refractory SE6. In a study conducted by Jeffrey Bucchalter it was found that 24% had a mean seizure duration of 31 minutes. In our study it was found that fever was the most common symptom and was found in 72% children, unprovoked seizures was found in 14% cases (Table 3).

In the study conducted by Kumar M, Kumari R, Narain N, it was found that fever was the most common symptom associated with patients of SE and it was seen in 57 patients (67.14%). In our study 16% cases had a previous history of convulsion while 84% presented with SE as first episode of convulsion. In the study by Kumar M, Kumari R, Narain N, 25.7% had prior history of convulsion whereas 74.3% presented with SE as first episode of convulsion.[9]

Our study showed that only 14% had a family history of seizure. In a study conducted by M Wipopo EE, Akhatar S, Fan P in Zhongnan hospital, China it was seen that family history of seizure was noted in only 9.5% patients. In a study conducted by Singh RK, Stephens S, Berl MM, Chang T it was found 25% had a family history of seizure. Shinnar S, Pellock JM, Berg AT, O'Dell C found in their study 11% had a family history of epilepsy while 15% had a family history of febrile seizures.[10]

In our study 28% of patients with status epilepticus were admitted in PICU. No mortality was seen in our study. Lacroix J, Deal C, Gauthier M studied admission of children with status epilepticus in paediatric intensive care unit (PICU) over 10 yrs and showed that 147 children 0 to 16 yrs., of age (median 1; mean 3.4 +/-3.9 [SD])with status epilepticus were admitted to a PICU.

CONCLUSION

Status epilepticus is a common neurological emergency in children. Management requires simultaneous resuscitation and medical stabilization, diagnosis of the underlying cause, and definitive rapid treatment. The mortality and morbidity associated with SE has decreased over the years due to a systematic approach and prompt management. Earlier the time frame for definition of status epilepticus was 30 minutes. But the use of operational definition of 5 mins., is helpful as it prevents brain damage. This was the reason for using the operational definition of 5 mins. in our study. As most of our patients presented with fever, control of fever is important in domiciliary setting. Treatment of SE needs to be started early because if they persist longer, they

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become more refractory to treatment and chances of complications will increase. Thus, the need for pre-hospital use of intranasal or buccal midazolam is important. Promotion of domiciliary management will thus contribute towards decreasing the burden of SE. In our study, in 4% patients, CSF study revealed antibodies against Japanese encephalitis. As it is a preventable disease, there is a need for strengthening the disease specific immunization programme especially in endemic zones for encephalitis. Neuroimaging has been a very essential aid in our study for diagnosis and management.

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