Acta Biomedica Scientia
e - ISSN - 2348 - 2168
Print ISSN - 2348 - 215X
www.mcmed.us/journal/abs
Research Article

CLINICAL PROFILE AND OUTCOME OF STATUS EPILEPTICUS CHILDREN ADMITTED IN PICU

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ABSTRACT

Status epilepticus (SE) is a common life-threatening emergency that requires prompt recognition and management. SE can represent an exacerbation of a preexisting seizure disorder, the initial manifestation of a seizure disorder, or an insult other than a seizure disorder resulting in seizures. Objective of this study was to study epidemiology and clinical profile of Status epilepticus. Hospital based cross sectional study conducted on 50 children at Dept. of Pediatrics, SLIMS,Pondicherry. - Status epilepticus is one of the common neurological emergency which requires admission to PICU.In our study epilepsy is one of the most common causes of status epilepticus. Early and appropriate treatment with anticonvulsants and use of mechanical ventilation may improve the outcome.

Keywords: - Status epilepticus, mortality, clinical profile.

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Received: 04.01.2017	**Revised**:25.01.2017	**Accepted**:12.02.2017

INTRODUCTION

Status epilepticus (SE) is a medical emergency, and its neurological outcome is a concern to every pediatrician in developing countries. The estimated convulsive status epilepticus (CSE) prevalence is 14.5 per 100,000 per year in developed countries [1-5], but population-based studies are not available from developing countries. There is significant morbidity (28-34%) and mortality (7-22%) with SE despite advancement in treatment protocols in the last decade [6-7]. It is documented that if convulsion persisted beyond 10 minutes, it leads to irreparable brain damage and difficulty in controlling the seizure [8]. Childhood survivors of SE may develop long-term consequences such as developmental delay, cognitive impairment, and recurrent seizure.

The burden of acute neurologic affliction in pediatric population is high and contributes to 16.2% of the total admissions to pediatric intensive care units (PICU) globally [1]. Status epilepticus (SE) is the commonest neuro-emergency in children and as per epidemiological studies in western countries, it's estimated incidence in children (18– 20 per 100,000 children per year) is much greater than the adult incidence of around 4–6 per 100,000 per year [6-9]. Despite advances in management, SE in children is associated with significant mortality as well as permanent morbidity in the form of epilepsy or neurological disability in developing countries like India. The common causes of SE in children vary from region to region as evidenced by the differences in the results of studies conducted in developing and developed nations. Also, there are substantial differences between older and younger children in terms of etiology as well as outcome. For planning of management strategies and appropriate resource allocation, there is thus a need for regional demographic statistics. Insight into risk factors associated with poor outcome is imperative for counseling of parents while the child is under intensive care.

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Population and hospital-based Indian studies required for this purpose are however limited. The use of operational definition allows early treatment before the seizure becomes refractory to antiepileptic drugs. 4 Prolonged status epilepticus can lead to various complications such as cardiac dysrhythmia, metabolicderangements, autonomic dysfunction, neurogenic pulmonary oedema, hyperthermia, pulmonary aspiration and even permanent neurological damage. Approximately 4-10% of children experience one episode of seizure within first 16 years of life. Approximately 30% of patients presenting with status epilepticus are having their first seizure. Status epilepticus is most common in children younger than 5 years of age with an incidence of >100 per 100,000 children. Convulsive status epilepticus (CSE) is most common form of status epilepticus and accounts for about 90% of all SE in children.Mortality from status epilepticus varies from 3- 50% [10-11] in different studies.

MATERIAL AND METHODS

Study design

Hospital based prospective study Study place: Dept. of Pediatrics, Sri Lakshmi Narayana Institute of Medical sciences,Pondicherry, Study population: All children aged between 1 month to 12 years who at presentation or during the PICU stay had convulsive status epilepticus - defined as continuous seizure activity or recurrent seizure activity without regaining consciousness lasting for >5 min. Sample size: Sample size of 77 patients required at 80% study power and alpha error 5%. Madhu PK et al was found that 100 patients with status epilepticus admitted to PICU and mortality of 30%, Sampling Method: Simple random sampling

Inclusion Criteria

All children aged between 1 month to 12 years who at presentation or during the PICU stay had convulsive status epilepticus - defined as continuous seizure activity or recurrent seizure activity without regaining consciousness lasting for >5 min.

Exclusion Criteria

Patients in whom the information regarding seizure duration will be incomplete or unclear, Data Collection: Informed consent will be obtaine from parents or guardians of the children included in the study. The duration of status epilepticus will be ascertaine from a reliable patient's relative or attendant, medical records and referring physician's note. After securing airway, breathing and circulation all the patients will be managed with standard treatment protocol. Once the child will be stabilize,data which included age, sex, duration of seizures before and after admission, type and number of antiepileptic drugs (AEDs) used for control of status epilepticus (SE), history of previous seizure pattern, adherence to treatment, perinatal, developmental, family history and history of coexisting medical conditions will be recorde. General physical examination and detailed neurological examination will be performe. Investigations like complete blood count, blood chemistries including serum calcium, random blood sugar, serum sodium, urea and creatinine, neuroimaging, CSF examination, Electroencephalography (EEG) will be performe as required to ascertain etiology and guide management. Further, during the hospital stay, recurrence of seizures, subsequent need for intubation and mechanical ventilation and days spent in PICU will be note. Type and etiology of status epilepticus will be classifie as per report of the International League Against Epilepsy (ILAE) task force on classification of status epilepticus. Refractory status epilepticus (RSE) was defined as seizures which persist despite the administration of two appropriate anticonvulsants at acceptable doses, with a minimum duration of status of 60 minutes (by history or on observation). Though febrile seizures are a part of acute symptomatic etiology,it has been considered separately for analysis as it is likely to erroneously amplify the severity of febrile seizures and dilute the severity of acute neurological insults.

Data Analysis

All data were analyzed on EPI-info statistical software. Qualitative data were expresse in the form of proportion. Quantitative data were expresse in mean ± SD. Qualitative data were compare by Chi square test.Unpaired t test will be use to infer the difference in means

Results:

Table 1.Clinico-demographic profile of scrub typhus

Discussion

The identification, intervention and reassessment of status epilepticus is continuous and fast as the electrical activity is ongoing. With each passing time, there is progressive brain damage during status, the treatment becomes eminent intervention to halt the seizure activity of the neurons. If the duration of status epilepticus is increased, the refractoriness of anti-epileptic drug increases leading to the development of refractory status epilepticus [12-13]. Refractory status epilepticus don't respond to first and second line anti-epileptic drugs and usually requires general anaesthesia is known as Refractory SE (RSE) [13]. The days without seizures are also included in the total duration of stay in the hospital. Status epilepticus is a common paediatric emergency where quick identification and proper management is needed. Understanding the clinical profile

and factors predicting morbidity and mortality with convulsive status epilepticus helps in modifying and adjusting the treatment and improve prognosis [14].

The causes of status epilepticus in children is distributed according to age in children; in children below 2 years the commonest cause is febrile illness or any other acute symptomatic causes like low blood sugar, drug withdrawal or brain concussion; whereas in children above 2 years remote symptomatic causes are the commonest [15]. neurological deficit and past history of convulsions is highly common in children > 2 years than those less than 2 years of age with status epilepticus [15]. Status epilepticus can have devastating effect on the developing brain. A child less than 3 years is more prone for sequalae of status epilepticus in the form of neuromotor deficits and behavioural issues affecting as many as 30% of cases as compared to 6 % in older children [16]. Majority of the cases of status epilepticus are terminated within first hour of onset of anti-epileptic therapy. Status epilepticus is unmanageable with AntiEpileptic Drugs, hence named as refractory status epilepticus (RSE) [17]. In the studies conducted in children in the western population which included all kinds of status epilepticus, nationality, frequency of seizures, the previously used anti-epileptic drugs and family history were formerly associated with refractory status epilepticus [17]. Of all the cases in the paediatric emergency department Seizure is the more common problem [18]. Epilepsy is a condition of brain that is indicated by an ongoing susceptibility and tendency to cause seizure activity. The effects of such epileptic form activity are not limited to seizure threshold but have a long term impact on child's neurobiological, mental and social profile. Epilepsy is diagnosed clinically as an incident of at least one epileptic seizure that is unprovoked with or without second episode of such seizure or adequate EEG and clinical details to explain an undergoing susceptibility to develop recurrences.

In this study, it was found that children less than five years of age comprised the majority of the cases (56.00%). Other studies have also found a higher prevalence in the younger age group. As the first episode of convulsion has been theorized to be due to the underdeveloped mechanisms for control of seizure activity, there is a disruption of neuronal function with minimal abnormalities in younger children. Also, younger age is more vulnerable to acute etiologies[19-20] including febrile seizures. In present study, the sex distribution shows slightly higher incidence of status epilepticus in males than females. Although they were almost in equal propotions, many other studies done both in pediatrics and adults shows similar type of results Gulati S observed 22 (70%) patients out of 31 were male.[21] It was observed that GTCS type of seizure is the commonest of 8 all 4 types similar incidence was observed by Kwong KL and Gulati et al [22].

The Pediatric Early Warning Signs (PEWS) score of all the patients presenting to the ER at our hospital is calculated for identification of patients at risk for rapid clinical deterioration and need of higher level of care. It is based on objective assessment parameters to determine the overall status of the patient and looks at three categories: behavior (neurological), cardiovascular and respiratory, with scores ranging from 0 to 3 in each category and a maximum total score of 9. A PEWS score of 3 in any one category or a total score of 5 or more has a very high risk [23]. In our study, a significant association was seen between PEWS score and outcome.

A systematic review of the outcome of convulsive status epilepticus in children showed that most studies report neurological sequelae in less than 15% and that cause is the main determinant of outcome [24]. The poorest outcome is reported in acute symptomatic status patients with neurological dysfunction in more than 20% of cases. CNS infections were a major underlying cause in children admitted to PICU with seizures in our study and this emphasizes the scope of preventive strategies in reducing disease burden in developing countries like India.

Conclusion

Status epilepticus is one of the common neurological emergency which requires admission to PICU. In our study epilepsy is one of the most common causes of status epilepticus. Early and appropr iate treatment with anticonvulsants and use of mechanical ventilation may improve the outcome.

Respiratory illness, infectious diseases, neurological problems and poisoning are the most common cause for PICU admissions. For further detailed prospective studies in future, with emphasis on the awareness of the most common and emerging rare etiology of patients admitted to PICU.

Several determinants like age, quality and time period of status epilepticus, cause, treatment and associated comorbidities determine the end result of Status epilepticus.

Most common causes of CSE in children are acute symptomatic, predominantly neuro-infections. Convulsive status epilepticus in children is associated with significant mortality and morbidity. Longer duration of status is associated with higher mortality. Hence, termination of seizure activity at the earliest, prudent management of associated co-morbidities like respiratory or circulatory impairment in these children would result in improved outcome. Improving the overall health care and implementation of vaccination strategies to prevent neuro-infections are important steps to prevent occurrence of CSE in childhood.

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Cite this article:
Divyashree Shetty. (2017). Clinical Profile and Outcome of Status Epilepticus Children admitted in PICU. *Acta Biomedica Scientia*, 4(3), 241-245.