

Profile of children admitted with seizures to a tertiary care rural hospital in Mandya district

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Abstract

Background: Seizures is one of the common causes of pediatric admissions to hospitals with significant mortality and morbidity. As there is limited data on profile regarding acute seizures episodes from the developing countries this study was undertaken. This study aims to assess the age wise distribution, etiology of seizure, classify seizure types and the outcome in children presenting with seizures to our hospital. **Methods:** This is a hospital based prospective study carried out in the Department of Pediatrics, Adichunchanagiri Institute of Medical Sciences, B.G Nagara, Mandya from 1st June 2014 to 31st May 2015. Parameters such as demographics, clinical presentations, laboratory tests, neuroimaging studies, EEG, diagnosis and course in hospital were assessed. **Results:** A total of 118 patients were admitted with seizures of which 69 (58.47%) were males and 49 (41.52%) females. Among these patients, 90 (76.27%) presented with fever and 105 (88.99%) children were less than 6 years of age. Generalized seizures were the most common seizure type 81(68.64%). Febrile seizures 57 (48.30%), symptomatic seizures 19(16.1%), seizure disorder 16 (13.55%), and seizures in cerebral palsy 8 (6.8%) were common etiologies. **Conclusions:** Acute episode of seizures are one of the commonest cause of hospitalization with high mortality. Febrile convulsions and CNS infections were common causes of seizures in febrile children. Seizures were more common in age 1month to 1year. Neuroimaging should be advised in all afebrile children and in children with partial seizures. CNS infections like meningitis and encephalitis, neurocysticercosis can be prevented with improvement in health care facilities.

Keywords: Seizures, Febrile Seizures, CNS Infections, Neuroimaging.

Introduction

A seizure is a transient occurrence of signs and/or symptoms resulting from abnormal excessive or synchronous neuronal activity in the brain [1]. Seizures account for about 1% of all emergency department visits, and about 2% of visits of children's hospital emergency department visits [2]. 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. The incidence is highest in children younger than 3 years of age, with a decreasing frequency in older children [3]. Worldwide, febrile seizures are the most common type of acute seizures in children [4]. In most of the studies, febrile seizures were reported to be the most common type seen in the pediatric population and account for the majority of

seizures seen in children younger than 5 years of age [2,4,5]. Central nervous system (CNS) infections are the main cause of seizures and acquired epilepsy in the developing world [5,6]. Children admitted in emergency department with new onset of non-febrile seizure are often evaluated using cranial computed tomography (CT) [7,8].

Geographical variations determine the common causes in a particular region. Acute seizures are common in meningitis, viral encephalitis and neurocysticercosis [9,10,11]. The standardized mortality rate (SMR) in patients with a newly diagnosed unprovoked seizure ranges from 2.5 to 4.1 according to the study population and design. The SMR is highest in the youngest patients and in those with symptomatic seizure [12]. In most children with newly diagnosed epilepsy, the long-term prognosis of epilepsy is favorable, and in particular,

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patients with idiopathic etiology will eventually reach remission [13].

Methods

All children admitted in the Paediatric ward/ICU with complaints of seizures (including recurrent episodes) in the age group of 1 month to 18 years and children admitted for other complaints and developing seizures during the course of their illness were included. Seizures in developmentally abnormal children were also included. Patients were divided into four age groups: age group (1 month–1 year), (1–3 years), (4–6 years) and (7–18 years).

The following information was obtained from each patient: age, sex, type of seizure, associated symptoms

Results

A total of 118 children were included Table 1(a) of whom the incidence of seizures among different age group was: 1 month to 1 year 40.67% (48), 1-3 years 34.74 % (41), 4-6 years 13.55% (16) and 7 to 18 years was 11.01% (13). There were 69 (58.47%) males and 49 (41.52%) females with male to female ratio of 1.4:1. As shown in table 1(b) Fever was notably present in 76.27% of children at presentation. In generalized seizures, GTCS was seen in 59 (50%) of the children followed by tonic seizures which were present in 11 (9.32%). Clonic 8 (6.77%), Myoclonic 2 (1.6%) and absence seizures 1 (0.84%) were seen less commonly. Among partial seizures, simple partial seizures were noted in 22 (18.6%), complex partial in 11(9.32%) and partial seizures with secondary generalization was seen in 4 (3.38%). Status epilepticus was present in 15 (12.71%) of children. Family history of febrile seizures was present in 8 cases, febrile seizures in 5 (4.2%) and epilepsy in 3 (2.5%) cases.

In the present study febrile seizures were the most common seizures noted 57 (48.3%). SFS was found in 35 (61.4%), AFS in 22 (38%). Symptomatic seizures were in 27 (22.8%) epilepsy in 16 (13.55%), seizures in cerebral palsy 8 (6.8%), benign neonatal seizures 4 (3.38%), space occupying lesions in 3 (2.54%) and others 3 (2.5%) of cases.

Among the symptomatic seizures bacterial meningitis 11, viral meningitis 4, TBM 2, encephalitis 2 and hypocalcemic seizures 4 were the common causes. About 103 (87.29%) of the children recovered normally. 8 (6.77%) recovered with deficit, 4 (3.38%) were referred, 2 (1.69%) went against medical advice and 1 died (viral Encephalitis).

Table 1(a): Age and Sex distribution data of patients presenting with seizures.

| Age | Frequency | Percent |
|----------------|-----------|---------|
| 1 month- 1year | 48 | 40.67 |
| 1 – 3 yrs | 41 | 34.74 |
| 4 – 6 yrs | 16 | 13.55 |
| 7 – 12 yrs | 13 | 11.01 |
| Total | 118 | 100 |
| Sex | | |
| Male | 69 | 58.47 |
| Female | 49 | 41.53 |
| Total | 118 | 100 |

Seizures were more common in males compared to females and febrile seizures were most common in 1 – 3years 29 (50.9%) followed by <1year 25 (43.85%) and 4 – 5years 3 (5.26%)

Table 1(b): Demographic data of patients presenting with seizures

| Type of seizures | Frequency | Percent |
|--------------------------|-----------|---------|
| Generalised | 81 | 68.64 |
| Generalised tonic clonic | 59 | 50 |
| Clonic | 8 | 6.77 |
| Tonic | 11 | 9.32 |
| Myoclonic | 2 | 1.6 |
| Absence | 1 | 0.84 |
| Partial | 37 | 31.35 |
| Simple partial | 22 | 18.6 |
| Complex partial | 11 | 9.32 |
| Secondary generalisation | 4 | 3.38 |
| Total | 118 | 100 |
| Fever | | |
| Present | 90 | 76.27 |
| Absent | 28 | 23.72 |
| Status | | |
| Present | 15 | 12.71 |
| Absent | 103 | 87.29 |

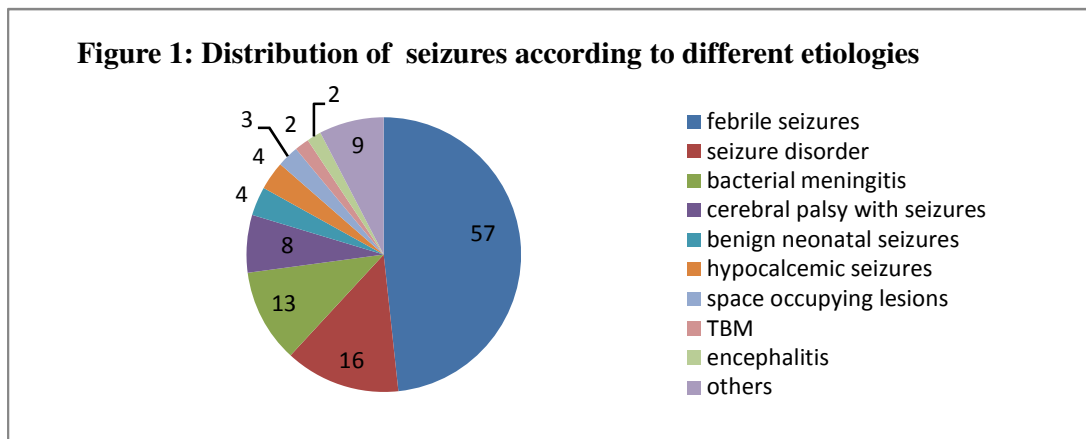


Table 2: Analysis of patients based on age groups

| | Males | females | Total |
|--------------------|-------|---------|-------|
| Seizures | 69 | 49 | 118 |
| Febrile | 32 | 25 | 57 |
| Febrile <1year | 14 | 11 | 25 |
| Febrile 1- 3 years | 17 | 12 | 29 |
| Febrile 4- 5years | 1 | 2 | 3 |

Lumbar puncture was performed in 69 children with abnormal reports were seen in 19(27.5%) children. Neuroimaging was done in 54 (45.76%) children admitted with seizure. Abnormalities were noted in 24 (44.4%) of patients who had undergone imaging. Electroencephalogram (EEG) was done in 48 (40.67%) children and had abnormal reports in 26 children.

Discussion

This was a hospital based prospective study of children admitted with acute onset of seizures in a tertiary care rural hospital of south India. It was aimed in studying demographics, clinical seizure types, etiologies and outcome during the hospital stay of those children.

Demographics and clinical seizure types: As in our study most studies show high incidence of seizures in younger children with a decreasing frequency in older age group and more common in males [2, 6]. Seizures coexisted with fever in 76% of cases. Most studies show generalized seizures are much more common compared to partial seizure [5, 8, 10]. In the current study generalized tonic-clonic was commonest seizure type and found to have higher incidence among febrile children. Most studies show generalized seizures are much more common compared to partial seizure [5,6,10] similar to our study. In the current study generalized tonic-clonic seizure was commonest seizure type and partial seizure was common among children more than 7 years. In our study we found that 86% of children presented with 1st episode of seizures whereas 14% of children already had one or more episodes before.

Etiological profile: Whether routine neuroimaging should be done in all children admitted with acute episode of seizure is debated [6,7]. In our study abnormal neuroimaging was present in only 24 (20.34%). Among SOL, NCC was seen in 2(1.7%) cases, tuberculoma in 1(0.84%) cases. Complex Febrile seizures (CFS) did not show any abnormality in CT which correlated with many studies. AAP recommends lumbar puncture for febrile seizure children aged less than 12 months [15].

CSF analysis was done for 69 children and we found abnormality in 19 children, (Bacterial-15/TBM-2/ Viral-2). There are many possible etiologies of a first seizure attack in children, including infection, neurologic/developmental causes, traumatic head injury, toxins, and metabolic disturbances [5,6,9]. Febrile seizures have been reported to be one of the most common causes of seizure attack in children [2, 5].

Primary outcome of acute seizure: There was no significant difference in the outcome among male and female. Fever was not independently associated with increased mortality during the acute illness. Meningitis

and encephalitis cause significant childhood mortality and morbidity [5,9]. Children with diagnosis of encephalitis and those with status epilepticus had poor outcome with high mortality [16]. In our study 1 child with encephalitis died. Febrile seizure had good outcome with majority of children discharged after recovery. As evident from current study provoked seizures including CNS infections and neurocysticercosis account for a good no Of cases.

Most of these might be prevented with improvement in sanitation. Attempt should be made to know the burden of other causative organisms for CNS infections and preventive measures should be undertaken. Health care facilities should be prepared for emergency management of seizures to decrease mortality and morbidity.

Limitations of the study: Outcome was defined in terms of mortality during hospital stay and we were unable to study morbidities like neurological dysfunction and impact on scholastic performance. The details of other causes contributing for seizures like inborn error of metabolism were not evaluated due lack of investigations or other issues. Multi centric prospective study with longer follow up is needed to find out details regarding these problems.

Conclusions

Acute episode of seizures are one of the commonest cause of hospitalization with high mortality. Febrile convulsions and CNS infections were common causes of seizures in febrile children. Seizures were more common in age 1month to 1year. Neuroimaging should be advised in all afebrile children and in children with partial seizures.

CNS infections like meningitis and encephalitis, neurocysticercosis can be prevented with improvement in health care facilities. Group of children presenting with unprovoked seizure require long term follow up studies including neurophysiologic studies and neuroimaging (CT or MRI) for better understanding of childhood seizure disorder in developing countries.

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