Original Article

First Seizure in Children – A Study of Etiology and Prognosis

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ABSTRACT

Epilepsy is one of the most common disorders of the brain. Epilepsy is defined as two or more unprovoked seizures. Epilepsy in children is due to diverse group of etiologies. Identifying the underlying cause of epilepsy or specific electroclinical syndrome is critical to understanding its natural history and best treatment options. All children between 1 to 12 years of age group presenting with first episode of seizure were included. Acute symptomatic seizures were the most common cause of seizures in this study. Seizures were controlled with single anti-epileptic drug (AED) in most of the subjects. Majority of the children had a favourable outcome.

Keywords: Epilepsy, seizure, electroclinical syndrome, anti-epileptic drug (AED).

INTRODUCTION

Epilepsy is one of the most common disorders of the brain.[1] According to a World Health Organization (WHO) survey, epilepsy accounts for 1% of the global burden of disease, a figure equivalent to breast cancer in women and lung cancer in men.[2] Epilepsy is defined as two or more unprovoked seizures. Epilepsy in children is due to diverse group of etiologies. Additionally, many children have a specific electroclinical syndrome, defined as "a complex of signs and symptoms that define a unique epileptic condition."

Such syndromes denote specific clinical seizure types, EEG findings, characteristic clinical features (e.g., age at onset and associated neurologic and psychological findings) and underlying pathophysiologic or genetic mechanisms. Identifying the underlying cause of epilepsy or specific electroclinical syndrome is critical to understanding its natural history and best treatment options. In this study, we evaluated the various causes of new onset seizures in the age group between 1 -12 years and classified them into epileptic syndromes according to ILAE. We also made an effort to assess the prognosis and give appropriate treatment.

MATERIALS AND METHODS

All children between 1 to 12 years of age group presenting to Neurology and Neurosurgery Departments of a tertiary care hospital with first episode of seizure were included. Demographic data and clinical details were taken and these children were evaluated with EEG, CT/MRI of brain and necessary blood investigations. All children below one year and above 12 years of age were excluded from the study. Children who were already on antiepileptic drugs and those with pseudoseizures were also excluded. Data was analysed using SPSS software.

RESULTS

A total of 400 children were screened for the study. 250 children did not fulfill the inclusion criteria and therefore excluded from the study. Out of the remaining 150 children, 91 (60%) were boys and 59 (40%) were girls. Most cases are were distributed in the age group of 1-3 years followed by 7-12 years in this study. The most common seizure type was Generalised Tonic-Clonic Seizures (GTCS) type, accounting for 80% of total cases in the study followed by focal (20%), myoclonic (2%) seizures. Of the remaining 2 patients, one had absence seizures and other had atonic seizures. EEG was performed in all patients. EEG was abnormal in 75% (115 patients) of study population. Out of 150 patients 132 patients (88%) underwent imaging studies in the form of either CT/MRI. Imaging was not done in 18 patients (12% of study population). Of these 132 patients 64% of patients had normal imaging studies and 36% of patients had abnormal imaging study. The most common cause of seizures was Febrile seizures, which was seen in 42 patients (30%) of the study population. The next common cause is meningoencephalitis accounting for 34 cases (23%). No cause was identified in 18 patients (15%) of the study population. As extensive etiological workup was not done in these patients due to financial constrains these patients were considered to have unidentified cause.

In patients with febrile seizures, 54.7% had simple febrile seizures and the remaining patients (45.3%) had complex febrile seizures. In this study Simple febrile seizures were more common than complex febrile seizures. Among the study population, 24 patients had focal seizures. Granuloma was found in 25% of these patients – Neurocysticercosis in 12.5% and Tuberculoma in 12.5%. Overall, imaging was abnormal in 32% of the cases. Cerebral edema and meningeal enhancement were the most common finding on imaging. Acute symptomatic seizures were the most common cause of seizures accounting for 60% of study population. Acute

symptomatic seizures were due to infectious, granulomas, metabolic and toxic causes. Febrile seizures were next most common cause of seizures accounting for 28% of study population. Valproate is the most commonly used Anti-Epileptic Drug (AED) in this study group and was found to be effective in most of the cases in controlling the acute episode. Phenytoin was the next most used drug. Seizures were controlled with single AED in most children, whereas children with Hypoxic-Ischemic-Encephalopathy (HIE), and post-encephalitic sequelae required 2-3 AEDs for complete cessation of seizures. Out of 150 patients, 89% were treated successfully, 5% had deficits and 2% of patients succumbed to death. Most of the children who developed deficits presented late to the hospital and had structural damage to the brain.

DISCUSSION

Demographics and clinical seizure types

Seizures are a common neurological symptom in children presenting to the hospital. In our study, we tried to analyse the various factors which are responsible for the onset, recurrence and poor outcome in children presenting with seizures. Most studies show high incidence of seizures in younger children with a decreasing frequency in older age group and more common in males[3,4] . Most children with seizures in our study were younger than 3 years of age (50%). Males (60%) had higher prevalence compared to females (40%) similar to other studies[5,6,7]. In our study, Seizures coexisted with fever in 30 % of cases. Most studies show generalized seizures are much more common compared to partial seizure[8] similar to our study.

Etiological profile

Imaging was done wherever possible in our study population. Abnormal neuroimaging was present in only 36% of the children. Among the patients with partial seizures, 88% had abnormal imaging, which is higher when compared to previous study[9]. The reason could be that this study is conducted at a tertiary care centre, where semiology was correctly identified and immediate good quality imaging was done in these children. In our study, acute symptomatic seizures were due to infectious, granulomas, metabolic and toxic causes, which was similar to the study by Sarvanan[10]. EEG was found to be abnormal in 75% (112) of the cases similar to study by Mohd Ashraf et al[12]

Outcome of first seizure

There was a favourable outcome in 89% of the study population where as 2% of the study population had poor outcome. All children who succumbed to death had multiple seizure episodes and required more than one AED and had structural lesion on imaging. These findings were consistent with previous studies[13,14].

CONCLUSION

Seizures are one of the commonest causes of hospitalization in children with high mortality. Febrile convulsions followed by CNS infections were common causes of seizures in children presenting to the emergency. Seizures were more common in 1-to-3-year age. Neuroimaging should be advised in all children with partial seizures. CNS infections like meningitis and encephalitis, neurocysticercosis when identified and treated early, can be associated with lesser mortality and morbidity. Children with a specific electroclinical syndrome can be prognosticated early. Specific neurophysiologic studies and neuroimaging (CT or MRI) may be required for better understanding of childhood seizure disorder in developing countries.

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