Innovations

Original Research Article:Clinico-Etiological Profile of First Episode Seizures in Children study done in ACSR Government medical college, Nellore

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Abstract:

Introduction: *Seizures are one of the most common neurological disorders we encounter inour day-to-day medical practice. About 4-10% of children experience at least one episode in the first 16 years of life. There is a limitation of information concerning acute seizures in the paediatric population from developing nations. The main aims are to identify the common etiological factors of first-episode seizures in children, as well as classify their type of presentation in children who present to a Govt General hospital in Nellore, Andhra Pradesh, India.* ***Material and methods****: A hospital-based prospective study was carried out in the Department of Paediatrics, Government Medical College Nellore, over one year period, and all children aged one month to 12 years were admitted with the first episode of seizure.*

Results: *A total of 84 children had first-episode seizures as a presenting complaint with 52 males and 32females. Among these first episodes of seizure are the highest at 65 (77.4%) in the age group of 1 month – 5 years. Febrile seizures are seen in 45(53.6%) and were the most common etiological cause followed by meningitis 18 (21.4%). GTCS Generalized tonic-clonic seizures 64 (76.2.1%) were the most common seizure type followed by focal seizures (15.5%).* ***Conclusion:****In our study, we discovered that febrile seizures were the most common cause of seizures in our study, followed by meningitis, and neurocysticercosis. A comprehensive evaluation, including a careful history, physical examination, laboratory testing, EEG, and neuroimaging studies, is required to identify the pathology causing the seizures. Children diagnosed with seizures require long-term follow-up, including neurophysiological studies.*

Keywords*: 1.Febrile seizures, 2.Neurocysticercosis, 3.EEG*

Introduction:

Seizures are transient signs and/or symptoms caused by abnormally excessive or synchronous neuronal activity in the brain.[1]

These are common neurological disorders in children, most often in children under 3 years of age. They decrease in frequency after that and account for about 2% of all pediatric emergency room visits. [2] Approximately 4-10% of children experienceat least one seizure (febrile or afebrile) in the first 16years of life.[3]

In most studies,febrile seizures are reported to be the most commonestaetiology in thepediatric population, primarily seen in children younger than 5years of age.[4-6]

Central nervous system (CNS) infections are the main cause ofprovoked seizures and acquired epilepsy in the developing world.[7]
The age and neurodevelopmentmaturity status determine the clinical manifestationsand the type of seizure disorders encountered.[8]Neuroinfectious (pyogenic meningitis, encephalitis,
neurocysticercosis), cerebral malaria, and epilepsyare common prevalent causes of childhood acuteseizures.[9-11]
Children with a first seizure episode underwent neuroimaging, electroencephalogram (EEG), sepsis screening, metabolic screening, etc. Little is known about the causes of seizures in children in India. Therefore, the present study sought to identify the demographics and common aetiology of seizures in children admitted to our tertiary care centre in Andhra Pradesh

Material and methods: A hospital-based prospective study was carried out in the Department of Paediatrics, Government Medical College Nellore, over one year period, and all children aged one month to 12 years were admitted with the first episode of seizure.
84 cases were studied over one yearwho were admitted with the presenting complaint of a first-episode seizure.
The following information was obtained on a predesignedstructured proforma from each patient: age (range from 1 month to12 years), sex, demographics (religion, rural/urbantype of seizure, associated symptoms (fever, headache), family history of seizure orepilepsy, birth and developmental history, Glasgow Coma Scale(GCS) score on admission, detailed neurological assessment, laboratory test results (white blood count, C-reactive protein,serum electrolytes, blood sugar and cerebrospinal fluid (CSF)analysis, neuroimaging ie cranial CT scan or cranial magneticresonance imaging (MRI), electroencephalography (EEG),duration of hospital stay, final diagnosis and outcome.
Inclusion criteria:
1. Children admitted to the pediatric ward with first-onsetseizure
2. Age group of 1 month to 12 years.
All the findings were recorded in a pre-designedproforma and the results were analyzed.

Results:
There was a total of 1782 patients admitted to the paediatric ward during the study period. Out of these patients, 84 (4.71%) children had first-episode seizures as a presenting complaint. However, 142 children (7.97%) in total were admitted with seizures (any episode) during this period. Among 84 children 65 (77.4%) were in the age group of 1 month to 5 years and 19 (22.6%) were in the age group of 5 years to 12years. The sex-wise distribution of children showed an overall male predominance, male to female ratio of52:32 (male: female=1.6:1).
Among 84 cases of the first episode of seizures, we observed a family history of seizures positive in 9 cases.
In our study most common age group of the first episode of seizure was 1 month to 5 years we noticed in 65 cases. In 65 cases GTCS seizures were observed in 52 cases, 8 cases with focal seizures,4 cases of myoclonic seizures, and one case of absent seizure were observed. 19 cases between the age group of 5 years to 12 years. Out of 19 cases 12 cases presented with GTCS presentation,5 cases presented with focal seizures, and 2 cases with absent seizures.
According to the aetiology out of 84 cases, 68 children had seizures with fever, and 16 children were present without fever. Of 68 seizure cases 45 (66.1%) cases with febrile seizures,the remaining 23 cases 18 cases of meningitis,3 cases of viral encephalitis, and 2 cases of TB meningitis.
Out of 16 children's seizures without fever 8 cases of neurocysticercosis, 4 cases of CNS structural lesions,2 cases of cerebrovascular accidents, and 2 cases with metabolic causes (2 hypoglycaemia).
We found the most common etiological cause in the age group of 1 month to 5 years was febrile seizures(45 cases),in 5 years to 12 years most common etiological cause was meningitis (10 cases).
Overall febrile seizures 45 (53.6%) were the most common etiological factor for the first episode of seizures in the paediatric age group.

Lumbar puncture (CSF analysis) was performed in all 84 children with abnormal reports in 25 (29.8%). Neuroimaging was done in 52 (61.9%) children admitted with seizures. Neuroimaging revealed abnormalities in 28 (33.3%) cases. Electroencephalogram (EEG) was done in 38 (45.2%) children and had abnormal reports in 14 cases.

We assess the outcome by observing residual neurological deficits. Focal neurological deficits at discharge had a strong positive association with CNS structural and vascular lesions and a strong negative association with febrile seizures as shown in Table 3. There is no mortality in our study.

Table 1: Demographic data of the study population in the first episode of seizures

	1 month to 5 years	5 years to 12 years	Total
Male female ratio	M: F 42:23	M: F 10:9	M: F 52:32
Family history positive for seizures			
Yes	7	2	9
No	58	17	75

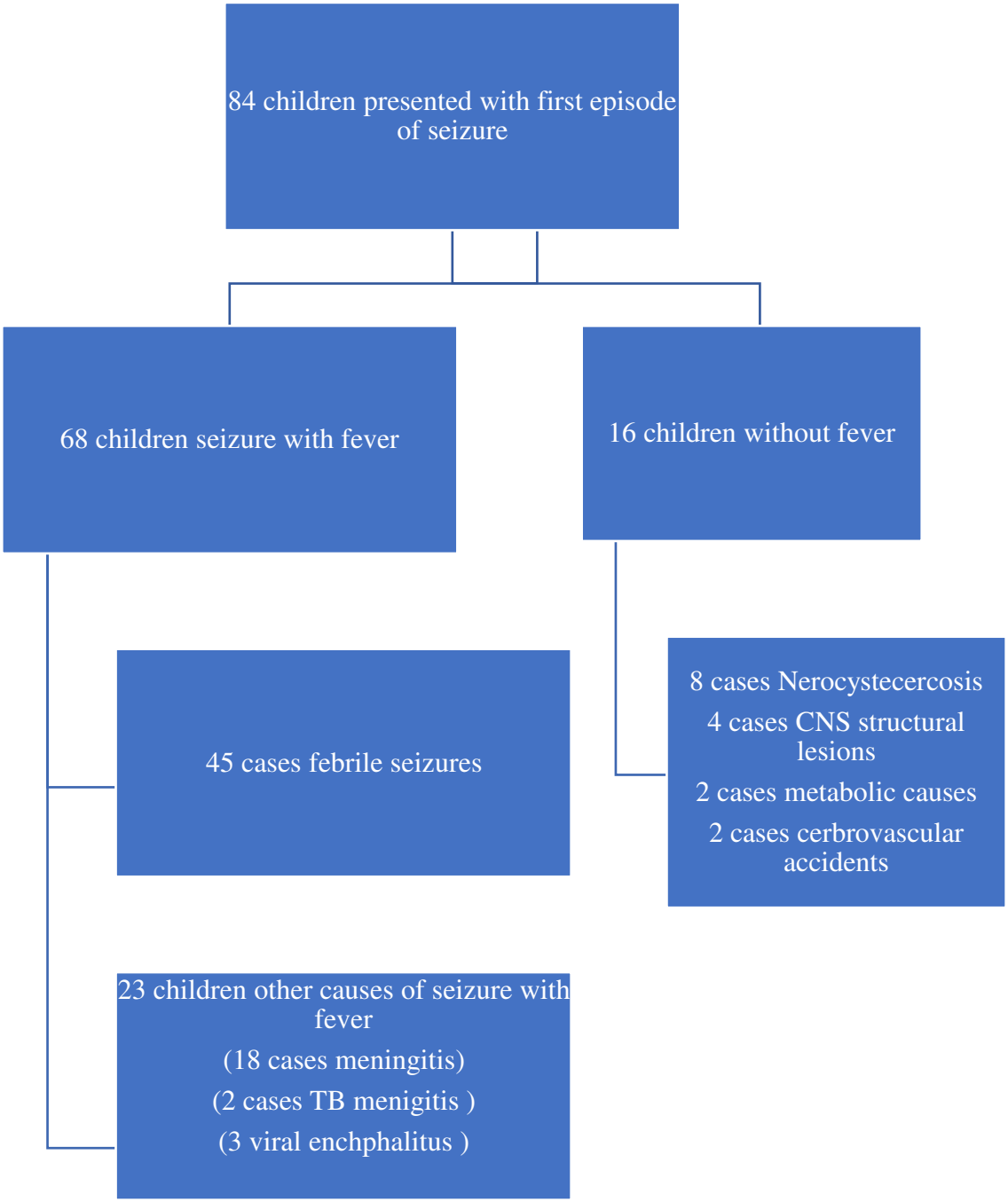
Table 2: Types of seizure presentation in the first episode of seizure.

	1 monthto 5 years	5 years to 12 years	Total
GTCS (Generalised tonic-clonic seizures)	52 (61.9%)	12 (14.3%)	64(76.2%)
FOCAL	8 (9.5%)	5 (5.95%)	13 (15.5%)
Myoclonic	4(4.76%)	0	4(4.76%)
Absent seizures	1 (1.2%)	2(2.4%)	3 (3.6%)
Total	65 (77.4%)	19 (22.6%)	84(100%)

Table 3: **Various etiological factors of the first episode of seizures and outcome in the paediatric age group**

	1 month to 5 years	5 years to 12 years	Total	Discharged with focal neurological deficits	Discharged without focal neurological deficits
Febrile seizures	45 (53.6%)		45(53.6%)	0	45(53.6%)
Meningitis	8(9.5%)	10(11.9%)	18(21.4%)	2(3.8%)	16(19%)
Viral meningitis	3(3.6%)		3(3.6%)		3(3.6%)
Tubercular meningitis		2(2.4%)	2 (2.4%)	1(1.2%)	1(1.2%)
CNS structural lesions	4(4.76%)	0	4(4.76%)	4(4.76%)	0
Metabolic causes	2 (2.4%)	0	2(2.4%)	0	2(2.4%)
Neurocysticercosis	1(1.2%)	7(8.3%)	8(9.5%)		8(9.5%)
Cerebrovascular accidents	2(2.4%)			2(2.4%)	
Total	65(77.4%)	19(22.6%)	84 (100%)	9(10.7%)	75(89.3%)

Figure 1:Flow chart of the first episode of the seizure



Discussion:

This study was a hospital-based prospectivestudy of children with the first episode of seizure admittedin the department of Paediatrics,Government Medical College Nellore, Andhra Pradesh Indiaover one year period.

Total admissions during the study period were1782 (patients aged 1 month to 12 years), out of which142(7.97%) were patients with seizure and 84(4.71%) were patientswith the first episode of seizure. Hence, the prevalence of the firstepisode of seizure in 1 month to 12 years of age in ourstudy was 4.71 %. which is lower thanthe study conducted by Adhikari et al.[12],

The prevalence in our study was higher ascompared to 2.1% in a study by Gogoi et al[13], and 1% by Chen etal[7].

The present study showed that seizure was moreprevalent in males (male:female = 1.6:1). Similarstudy conducted in Chandigarh and South Indiaalso showed males have more chances of seizurecompared to females.[14,15]

Seizures with fever were seen in 80.9% ofcases in the present study, and the higher side was reported as 68% byChen et al[7], and 53.5% seen byAdhikari S et al [12].Saravan S [15] in his study observed fever in51.5% of patients.Most studies show generalized seizuresare much more common compared to partial seizures.[6,7,12] In thecurrent study too, generalized tonic-clonic was the commonestseizure type (76.2%) and was found to have a higher incidence amongfebrile children (80%). GTCS was found to account for 71.2% ofcases in the study done by Chen et al.[7]

We discovered that febrile seizures (53.6%) were the primary cause of a first seizure attack in children under the age of five a figure that Adhikari et al[12] reported as 53%.The commonest aetiology was febrileseizures (62%) in the study by Chen et al[7], while it was 71% asfound by Landfish et al.[16]

Focal seizures, focal neurologic deficits, and developmental abnormalities were the strongest predictors of abnormal neuroimaging, while central nervous system infections, vascular events, and neurocysticercosis were the strongest predictors of abnormal neuroimaging requiring urgent intervention

Conclusion: First episode of seizure is one of the most common reasons for hospitalization and is associated with high morbidity and mortality. Febrile seizures are the most common cause of seizures in children. Seizures occur more often in children under 5 years of age. Neuroimaging should be recommended for all febrile children and children with partial seizures.

This study provides information on possible etiological factors that lead to the development of primary seizures in different age groups, which will help paediatricians plan examinations and inform the family about possible risks.

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