

Etiological Profile of Children Admitted With Seizures in A Tertiary Care Hospital

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Abstract:

Background: Seizure is one of the common causes of childhood hospitalization with significant mortality and morbidity. There is limited data regarding acute seizures episodes from the developing countries.

Objective: Current study aims to find the etiology of seizures in a tertiary care hospital of Jharkhand in the age group 6 month to 5 years.

Materials and method: 200 consecutive cases admitted to the hospital with convulsions in this particular age group were studied by detailed history, thorough examination and stepwise investigations including blood counts, CSF analysis, EEG and neuroimaging studies.

Results: The most common cause for seizures in our study was febrile seizures (34.5%). Other causes included viral encephalitis (18%), pyogenic meningitis (9%), TB meningitis (7.5%), epilepsy (8%), Neurocysticercosis (4%), Cerebral malaria (3%), hypoglycaemia (2%), head injury (1%) late HDN (0.5%). Cerebral palsy, mental retardation syndromes with developmental delay constituted 2.5% of the cases.

Conclusion: Seizures in children can be due to various underlying pathology. A detailed history, thorough examination and certain investigation helps to recognize the cause for the convulsions and can be treated accordingly.

Keywords: seizures, Etiology, Clinical examination, Investigations

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I. Background

Seizures are the most common pediatric neurological disorder. A seizure or convulsion is a paroxysmal, time limited change in motor activity and/or behaviour that results from abnormal electrical activity in the brain. Four to ten percent of children suffer at least one episode of seizure in the first 16 years of life. The incidence is highest in children less than 3 years of age, with a decreasing frequency in older children [1]. Seizures account for about 1% of all emergency department visits, and about 2% of visits of children's hospital emergency department visits [2]. The incidence of epilepsy (recurrent unprovoked seizures) in children and adolescents seems relatively consistent across all populations studied, ranging from 50 to 100/100,000 personyears [3]. The different causes of seizures are febrile convulsions, CNS infections, neurologic or developmental disorders, metabolic disorders, traumatic or vascular events, epilepsy and oncologic lesions[4]. In most of the studies, febrile seizures were reported to be the most common type seen in the paediatric population and account for the majority of seizures seen in children younger than 5 years of age [2-5]. Central nervous system (CNS) infections are the main cause of seizures and acquired epilepsy in the developing world [5, 6]. Geographical variations determine the common causes in a particular region. Acute seizures are common in meningitis, viral encephalitis and neurocysticercosis and in most cases are associated with increased mortality and morbidity, including subsequent epilepsy [4-9]. 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 [10]. It is not always immediately clear which laboratory and imaging examinations should be performed when children are admitted with seizures. Treating physicians have to decide for further investigations including septic screen, metabolic studies, lumbar puncture and electroencephalogram (EEG) for patients who present with a first attack of seizure. There is concern for cost of these investigations in resource poor developing countries. Misdiagnosis carries the potential risk of legal problems, can cause family anxiety, lead to excessive hospital stay, and possibly result in life-threatening events. There are limited studies on etiological profile of seizure in developing countries. Most studies had done so far have focused on epilepsy and clinical seizure types [11]. In this

descriptive study, we therefore analyzed the prevalence of various etiologies in children admitted with seizures in the age group of 6 month to 5 years.

II. Methods

The study was done on 200 consecutive cases admitted to pediatric ward of tertiary care teaching hospital in Jharkhand, to know the various etiologies of seizures in children between 6 month to 5 years of age during the period between November 2014 and October 2015. Children less than 6 month and more than 5 years of age, cases with toxicological causes of convulsions and children with seizures onset after hospitalization were excluded. Events such as breath holding spells, gastroesophageal reflux, syncope, psychologic disorders that mimic seizures were also excluded.

The following investigations were done stepwise depending on the clinical presentation.

- a) Complete blood counts which included haemoglobin, TLC, DLC, platelet count, ESR, PBS.
- b) Metabolic screening mainly serum calcium and serum glucose.
- c) Lumbar puncture for CSF analysis.
- d) Others investigations: JE serology, Dengue serology & paratubercular and PBS for MP as and when required.
- e) Electroencephalograph (EEG)
- f) CT scan (plain and contrast)
- g) MRI as and when required

For etiological purpose, febrile seizure was defined as “seizures that occur between the age of 6 and 60 months with a temperature of 38°C or higher, that are not the result of central nervous system infection or any metabolic imbalance, and that occur in the absence of a history of prior afebrile seizures” and epilepsy is considered to be present when ≥ 2 unprovoked seizures occur in a time frame of >24 hr. Other etiologies including meningitis and encephalitis were diagnosed on the basis of clinical and laboratory investigation and verified with standard reference. *Statistical analysis* as the present study is a descriptive study, no statistical analysis was done. All the data are expressed as percentages.

III. Results

In our study the most common cause of convulsion was febrile seizures 34.5%. The other causes included viral encephalitis (18%), pyogenic meningitis (9%), hypocalcaemic seizures (10%), TB meningitis (7.5%), epilepsy (8%). Few other causes were neurocysticercosis (4%), cerebral malaria (3%), cerebral palsy (2.5%), hypoglycaemia (2%), head injury (1%) and late hemorrhagic disease of newborn (0.5%).

IV. Discussion

This was a hospital based descriptive study to know the etiology of seizures in children between 6 month to 5 years of age. A total of 200 consecutive cases with convulsion admitted to the hospital were studied. Febrile seizures are the most common convulsive disorders in young children. In our study, febrile seizures were the most common cause accounting for 34.5% of all our cases. In United States, South America and Western Europe they are reported to occur in 2-5% of all children between 6 months to 5 years of age. Febrile seizures are reported to be even more common in Asian Countries [12]. Its incidence in India in children < 5 years of age is 2-5% [13]. Viral encephalitis (18%) was the next important cause of seizure in our study. The incidence of viral encephalitis in India is unknown because of problems in establishing diagnosis and the fact that a wide variety of CNS disorders, both infectious and noninfectious, may mimic the illness. In a hospital based study in New Delhi from 2004 to 2005, out of 151 cases with encephalopathy, 57 were suspected as viral encephalitis. Of the 57 cases, etiological diagnosis was reached in 41 cases. The most common etiological agent identified in the study was enterovirus-71 in 20 patients (35.1%). The other viruses identified were mumps in 6 (10.5%), Japanese encephalitis in 5 (8.7%) and measles in 4 (7%) cases. Herpes virus, varicella zoster, rubella and dengue virus were identified in 1 case each [14]. The next common cause of seizures was metabolic, hypocalcaemic seizures (10%) & hypoglycaemic seizures (2%), predominantly occurring between 1 month to 1 year of age. Current study identified 9% cases of bacterial meningitis and 7.5% cases of TBM. In a study, out of 187 patients with bacterial meningitis, seizures were a manifestation in 25 (13%) [15]. In a study done over a period of 20 years in London on 38 children with CNS tuberculosis, seizures were observed in 20 patients (53%) [16]. Epilepsy constituted 8% of our cases. A meta-analysis suggests that the prevalence rate of epilepsy is 5.59 per 1000 population with no gender or geographical differences [13]. Neurocysticercosis is a major cause of seizures in countries endemic for the disease [17]. Recent onset focal seizures are the most common presenting symptom (70-95%) [13]. We recorded 4% cases of NCC with convulsions in our study. In a hospital based prospective study in south India conducted in 520 patients (1 month – 12 yrs) revealed incidence of 4.7% NCC [18]. Cerebral malaria is also a common cause of seizure in endemic areas. Around 80% of children with

cerebral malaria have generalised seizures [19]. In the present study we noted 3% cases with convulsions were due to cerebral malaria. The incidence rate greatly varies with endemicity and parasite species. In a population based study in Kenyan hospital in the age group of 0-13 yrs, over 80% seizures were associated with infections and falciparum malaria contributed 58% cases [5]. Cerebral palsy (2.5%), head injury (1%) and late HDN (0.5%) were other causes of seizures. Limitations of the study: The details of other causes contributing for seizures like inborn error of metabolism could not be specified due to lack of investigations. Multi centric prospective study is needed to find out details regarding these problems.

VI. Conclusion

Seizures are the most common pediatric neurological disorder worldwide. They are also one of the most frequent causes for visit to the emergency department. The etiology of seizures are various and are different for each age group. Seizures are usually a manifestation of an underlying pathology. It can be made from our study that most of acute symptomatic seizures are caused by febrile seizures, CNS infections like meningitis and encephalitis, neurocysticercosis or metabolic derangements which can be prevented and appropriately managed with improvement in health care facilities. Group of children presenting with unprovoked seizure require long term follow up for better understanding of childhood seizure disorder in developing countries context.

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