

Original article:

A Prospective Study on Profile of Children Admitted with Seizures at Tertiary Care Hospital in Punjab India

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Date of Submission: 11 August 2009, Date of Acceptance: 15 September 2009

ABSTRACT

Introduction: Acute seizures are among the commonest pediatric neurological symptom in mal-nutrient and sick children. It is characterized as a cluster of *seizures* over a short period of time in which the patient regains consciousness between *seizures*. In patients with fever, they include febrile seizures. Studies also suggest that upto 10% of children suffer at least one episode of seizure in the first 16 years of life. However the chances are fairly high in the children less than 3 years of age, and the incidence subsides in older children.

Materials and Methods: The prospective hospital based study was conducted in tertiary care hospital in children admitted in the age group 6 months to 15 years in the Paediatric Department. The Case selection was done in paediatric patients of between 1 and 15 years ages on the basis of detailed history, clinical examination and relevant investigations like electroencephalography, Neuroimaging, blood biochemical studies as required. Cases of neonatal seizures, single unprovoked seizure, provoked seizures (e.g. febrile seizures), seizures due to metabolic disturbances (e.g. hypocalcemic seizures etc.) and those with established neuropathology (e.g. meningitis, tuberculoma, neurocysticercosis, tubercular meningitis etc.) were excluded from the study. The diagnosis of epilepsy was made if the child had at least two unprovoked seizures. If child had multiple seizures in a 24 hours period, it was considered to be single episode.

Results: Total 200 patients were included in the study with the age group of 6 months to 15 years of age among them 124 were male and 76 were females. Meningitis was the most common cause of seizure followed by febrile seizure, Seizure disorder, Encephalitis, Neurocysticercosis Tubercular meningitis. The incidence of general and partial seizures in different age group was in 6 month to 5 year partial was 18 and general was 69. In 6 – 10 years age group partial was 16 and general was 34. In 11-15years age group partial was 11 and general 27.

Conclusion: The study concludes that the acute episode of seizures are one of the major cause of hospitalization with high mortality but also are the reasons of physical, mental and financial distress for their parents. Febrile convulsions and CNS infections were common causes of seizures in febrile children, CNS infections like meningitis and encephalitis, neurocysticercosis which can be prevented with improvement in health care facilities. On the basis of our study a long term follow-up study is required in the patients having with seizures with regards to their neuro-behavioural outcomes.

Key words: Seizures, Meningitis, Encephalitis, Neurocysticercosis.

INTRODUCTION

Acute seizures are among the commonest pediatric neurological symptom in mal-nutrient and sick children. It is characterized as a cluster of seizures over a short period of time in which the patient regains consciousness between seizures. In patients with fever, they include febrile seizures^{1,2}, acute symptomatic seizures (e.g. in a

child with pyogenic meningitis)³ or initial seizures in a child with epilepsy or epilepsy syndrome. Various studies suggest that febrile seizures are the commonest type of seizure in the patients of 0 – 6 years age.⁴ A seizure is an impermanent occurrence of signs or symptoms due to abnormal excessive or synchronous neuronal activity in the brain. When such seizures are involved in motor system then they are known as convulsions. Thus epilepsy is a condition which is exhibited by recurrent (two or more) unprovoked seizures occurring 24 hours apart.⁵

Studies also suggests that upto 10% of children suffer at least one episode of seizure in the first 16 years of life. However the chances are fairly high in the children less than 3 years of age, and the incidence subsides in older children.³ On the other hand seizures account for about 1% of all emergency cases admitted to the hospitals and about 2% of visits of children's hospital emergency department visits.⁶ Infection in the central nervous system (CNS) are the main cause of seizures and acquired epilepsy in the developing world.^{8,9} 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.^{10,11} The SMR is highest in the youngest patients and in those with symptomatic seizure.¹² In the children freshly diagnosed with epilepsy, the long-term prognosis of epilepsy is favorable, and in particular, patients with idiopathic etiology will eventually reach remission. In most children with newly diagnosed epilepsy, the long-term prognosis of epilepsy is favorable, and in particular, patients with idiopathic etiology will eventually reach remission. There are limited studies on causes and outcome of acute episode of seizure in developing countries. Most studies done so far have focused on epilepsy and clinical seizure types.⁹⁻¹² 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.⁹ In most children with newly diagnosed epilepsy, the long-term prognosis of epilepsy is favorable, and in particular, patients with idiopathic etiology will eventually reach remission.

MATERIALS AND METHODS

The prospective hospital based study was conducted in tertiary care hospital in children admitted in the age group 6 months to 15 years in the Paediatric Department. The Case selection was done in pediatric patients of between 1 and 15 years ages on the basis of detailed history, clinical examination and relevant investigations like electroencephalography, Neuroimaging, blood biochemical studies as required. Cases of neonatal seizures, single seizure, provoked seizures (e.g. febrile seizures), seizures due to metabolic disturbances (e.g. hypocalcemic seizures etc.) and those with established neuropathology (e.g. meningitis, tuberculoma, neurocysticercosis, tubercular meningitis etc.) were excluded from the study. The diagnosis of epilepsy was made if the child had at least two unprovoked seizures. If child had multiple seizures in a 24 hours period, it was considered to be single episode.

RESULTS

Total 200 patients were included in the study with the age group of 6 months to 15 years of age among them 124 were male and 76 were females. Meningitis was the most common cause of seizure followed by febrile seizure, Seizure disorder, Encephalitis, Neurocysticercosis Tubercular meningitis.

The incidence of general and partial seizures in different age group was in 6 month to 5 year partial was 18 and general was 69. In 6 – 10 years age group partial was 16 and general was 34. In 11-15years age group partial was 11 and general 27.

Table 1: Demographic data of patients presenting with seizure

	No fever n=100	Fever n= 100	Total n=200	P value
Sex				
Male	56	68	124	0.003
Female	44	32	76	
Age				
6mo-5 yr	35	72	107	0.001
6-10 yr	28	17	45	0.01
11-15 yr	47	11	58	
Type of seizure				
GTC-Generalized tonic- clonic seizure	52	78	130	0.004
Partial	30	15	45	0.7
Absence	8	1	9	0.10
Myoclonic	3	0	3	
Others	7	6	13	

Table 2: Incidence of partial and generalized seizure in different age groups

Age	GTC-Generalized tonic- clonic seizure	Partial	Total
6mo-5 yr	69	18	87
6-10 yr	34	16	50
11-15 yr	27	11	38
Total	130	45	175

Fig- 1: Etiological diagnosis of children with seizures

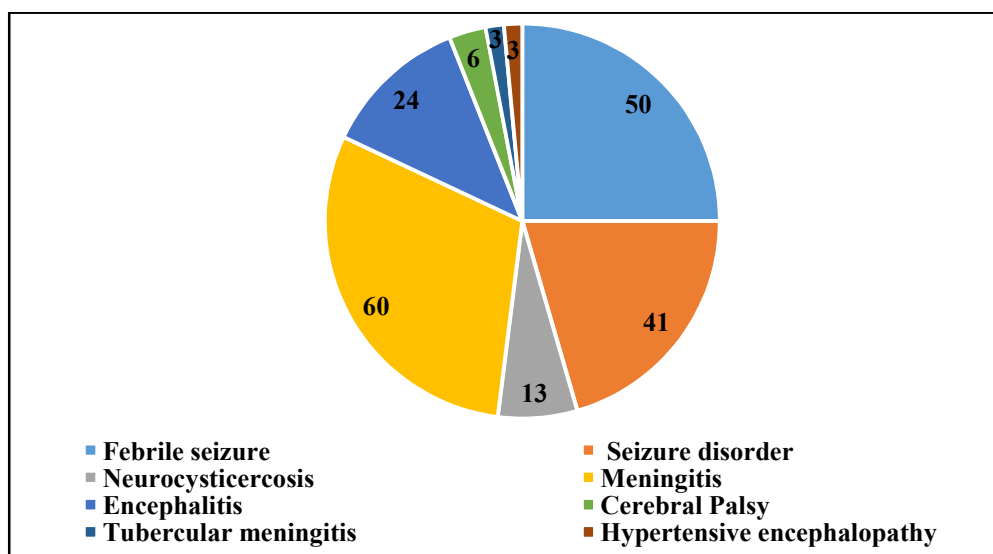
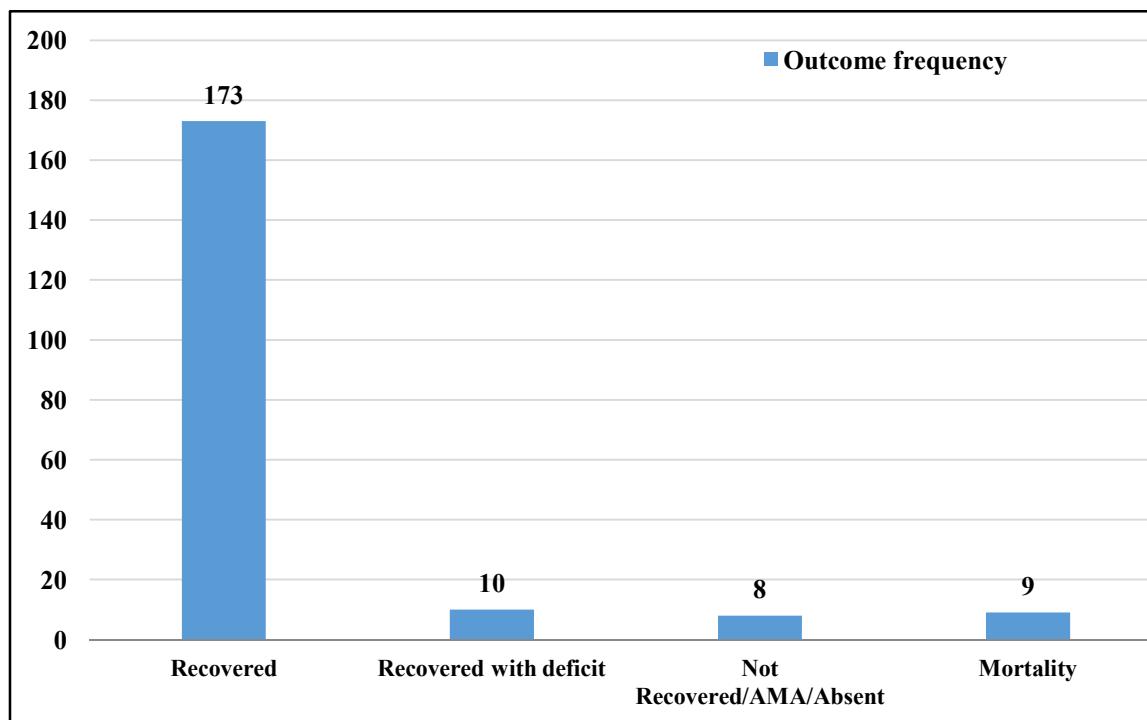


Fig- 2: Outcome



DISCUSSION

The present study was a hospital based retrospective study of children admitted with acute episode of seizure in a tertiary care centre in India. The study was aimed to study the effect of demographics, clinical seizure types, etiologies and outcome during the hospital stay of such children. Most studies show high incidence of seizures in younger children with a decreasing frequency in older age group and more common in males.⁸⁻¹⁰ The children undertaken in the study were average age of 6 years.

It aimed in studying demographics, clinical seizure types, etiologies and outcome during the hospital stay of those children. Neonates and infants under 6 months of age were excluded from the study because frequently they have conditions like septicemia, hypoxic ischemic encephalopathy, metabolic disorders which comprise one spectrum of diseases.⁹

Demographics and clinical seizure types Most studies show high incidence of seizures in younger children with a decreasing frequency in older age group and more common in males.⁷ Aetiological analysis revealed CNS infections to be commonest cause of seizure in pediatric age group, followed by SOL, epilepsy, febrile seizures and metabolic causes. Our findings were contrary to other study where febrile seizures were commonest cause followed by trauma, epilepsy and CNS infections.¹³ The could be several reasons behind this discrepancy, like average age in their study was 2 yrs while in present study it was 6 yrs, the later being less susceptible to febrile seizures. Secondly, due to a tropical and developing country we have high prevalence of CNS infections.

Most children with seizures in our retrospective study were younger than 10 years of age, where the boys had higher prevalence compared to girls in age group less than 10 years. Strikingly higher prevalence in female was noted in age group more than 10 years. Most studies show generalized seizures are much more common compared to partial seizure.^{3,15}

In the present study generalized tonic-clonic was most common seizure type and found to have higher incidence among febrile children. Partial seizure was common among children of developing countries with the setting of high incidence of neurocysticercosis.¹⁶

As evident from this study first acute attack of seizure due to neurocysticercosis and CNS infections comprises a big bunch of cases. To avoid such incidences regular monitoring, upliftment of sanitation and routine immunization for Hib and Japanese encephalitis vaccine should be taken care.^{11,17} So attempt should be made towards these preventive measures to decrease the mortality from seizure, more over further intensive study need to be done to identify the burden of other etiological agents of CNS infections, so that appropriate targeted preventive measures can be taken and at the same time health care facilities need further preparedness for more better handling and emergency management of seizure to decrease mortality and morbidity associated with seizure.

CONCLUSION

The study concludes that the acute episode of seizures are one of the major cause of hospitalization with high mortality but also are the reasons of physical, mental and financial distress for their parents. Febrile convulsions and CNS infections were common causes of seizures in febrile children, CNS infections like meningitis and encephalitis, neurocysticercosis which can be prevented with improvement in health care facilities. On the basis of our study a long term follow-up study is required in the patients having with seizures with regards to their neuro-behavioural outcomes.

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