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Research Article

SPECTRUM OF SEIZURE DISORDERS IN CHILDREN ADMITTED TO A TERITIARY CARE HOSPITAL

Jacob Kuruvilla*, Sahana K S, Shyam Sudhir M K, Prakash R.M Saldanha

Dept of Pediatrics, Yenepoya Medical College, Mangalore, Karnataka

Corresponding Author: Dr Jacob Kuruvilla, Junior Resident, Department of Pediatrics, Yenepoya Medical College, University Road, Deralakatte, Mangalore, Karnataka, South India - 575 018

Abstract

Background- Seizures are a common presenting symptom in the paediatric emergency department and there are various causes for the occurrence of seizures in children. **Aims and Objectives -**To study the spectrum of seizure disorders in children presenting to paediatric casualty at a tertiary care hospital. **Materials and Methods -**The present study is a retrospective analysis of the children presenting with seizures during the period of 24 months from January 2011 to December 2013 at a tertiary care hospital in South India. **Results-** 156 children in the age group of 1 month – 16 years were included in the study. Seizure types were determined and their etiologies were identified through clinical examination and investigations. Generalized Tonic Clonic seizure was the most frequent pattern seen in 146(93.5%) children. The most common aetiology was febrile seizures with about two thirds of the children (n=97) found to be febrile at presentation. 50 (32%) children diagnosed with cerebral palsy cases were admitted with seizure disorders while the rest included epilepsy in 22 (14.1%), symptomatic seizures in 4 (2.6%) and pseudo seizures in 4 (2.6%) children. Neuroimaging was done in 75 cases, of which positive findings were only in 45 cases most of which were cerebral palsy cases (n=43). **Conclusion** Simple febrile seizures accounts for majority of cases in developmentally normal children with generalized tonic clonic seizure as the most common pattern. The yield of neuroimaging is low in such cases and is only warranted when associated with developmental and neurological abnormality.

Keywords: children, seizures, etiology

INTRODUCTION

Seizures are a common presenting symptom in the paediatric emergency department with a high rate of incidence of seizures in children below three years[(1)] and they may also contribute to the neurological and cognitive impairment in children.[(2-4)] Febrile seizures account for the majority of cases world-wide, associated with a low risk of epilepsy even though recurrence may be found in every third child[(5, 6)] with no residual effects on intellect and behaviour.[(7)] Epilepsy on the other hand accounts for a significant burden of disease with medical complications especially if left untreated.[(8)] Another important aetiology of seizures, especially in developing countries, is infections of various kinds resulting in acquired epilepsy.[(9)] Cerebral palsy is associated with a high incidence of seizure disorders. Neuroimaging shows lesions in most of the affected children, which may be the possible reason for developing refractory seizures in them. [(10, 11)]

Detailed history and clinical examination forms the backbone of evaluation of any child presenting with seizure other than EEG which is recommended as a part of diagnostic evaluation. As epilepsy is often grossly or subtly associated with structural or metabolic defects in the brain,

imaging modalities have made a big impact on the diagnosis and treatment of epilepsy because of which pathologies like granulomas, malformations, vascular lesion, infection, tumours etc., could be easily diagnosed. [12, 13] Many studies have also proved that standard MRI is the neuroimaging of choice in evaluating patients with seizures especially newly diagnosed cases.[10, 14] Other studies like complete blood counts, electrolytes, serum calcium, blood glucose and CSF analysis should be based on specific clinical circumstances.[14]

MATERIALS AND METHODS

The study was conducted retrospectively in the paediatric department, Yenepoya Medical College, Mangalore between January 2011 and December 2013. The study included children admitted with seizures and those who developed seizures during the course of hospital stay. The age group of children ranged from 1month to 16 years. The data was collected from hospital records after obtaining clearance from the Institutional Ethics Committee, Yenepoya Medical College. With the help of a proforma, demographical and clinical histories of the patients with relevant examination findings were recorded. Seizures were categorised as generalized tonic-clonic (GTC), absence, myoclonic, partial and other seizures types on the basis of 1993 recommendations of International League against Epilepsy Commission on Epidemiology and Prognosis.[15] In addition, relevant laboratory investigations and reports of neuroimaging including CT and MRI, electrophysiological studies such as EEG as well as biochemical analysis of CSF were also recorded where ever available. Outcome of management was classified as discharge after recovery, discharge with deficit and discharge against medical advice.

Data was entered in Microsoft Excel spreadsheets and compared in SPSS (version 17.0). Proportions were calculated and associations were found out by using chi square test. P value <0.05 was considered to be significant.

RESULTS

There were 156 children who were admitted with seizure disorders during the study period. Of the 156 children included in the study 81 (51.9 %) were males and 75 (48.1%) females. Though the age of the children spanned a wide range as young as one month old and as old as sixteen years, most of the cases were under 3 years. GTC was the most frequent pattern of seizure seen in 146 (93.5%) children. The full description of the type of seizures noticed in our cases is shown in Table 1.

About two third of the children (n=97) were found to be febrile at presentation. Among them 54 were simple febrile seizures and the other 22 cases were atypical febrile seizures. 50 children who were diagnosed to have cerebral palsy were also admitted with seizure disorders during the study period. 14.1% of cases (n=22) were diagnosed with epilepsy. 2.6% (n=4) of cases had symptomatic seizure and pseudo seizures contributed to another 2.6% (n=4). The four cases of symptomatic seizures were due to hypoglycaemia, hypocalcaemia, hyponatremia and bacterial meningitis respectively. Out of the 156 children 34 %(n=53) had global developmental delay. Figure 1 shows the diagrammatic representation of the etiological spectrum of seizures. Most of

the children admitted with seizures were discharged after recovery while four children were discharged against medical advice. There was no mortality noted in our study.

Neuroimaging was done in 75 cases and it was not carried out in 81 cases either because it was not indicated or it was not consented for. Out of the 75 cases, sixty percent (n=45) showed positive neuroimaging findings. Majority of cases (n=43) were diagnosed with cerebral palsy with features suggestive of perinatal insult with ensuing structural abnormality and periventricular leukomalacia. Out of the remaining two cases one was epilepsy which showed reduced volume in right hippocampal region and the other was symptomatic seizure due to hypoglycaemia which showed an incidental finding of previous ischemic insult. Table 3 shows the detailed description of neuroimaging in our case series.

Table 1 - Distribution of type of seizure

Type of seizure	Frequency	Percentage
GTC	146	93.5
Tonic	2	1.3
Myoclonic	1	0.6
Absence	1	0.6
Simple partial	5	3.2
Complex partial	1	0.6
Total	156	100.0

Figure 1- Etiological Spectrum of Seizures

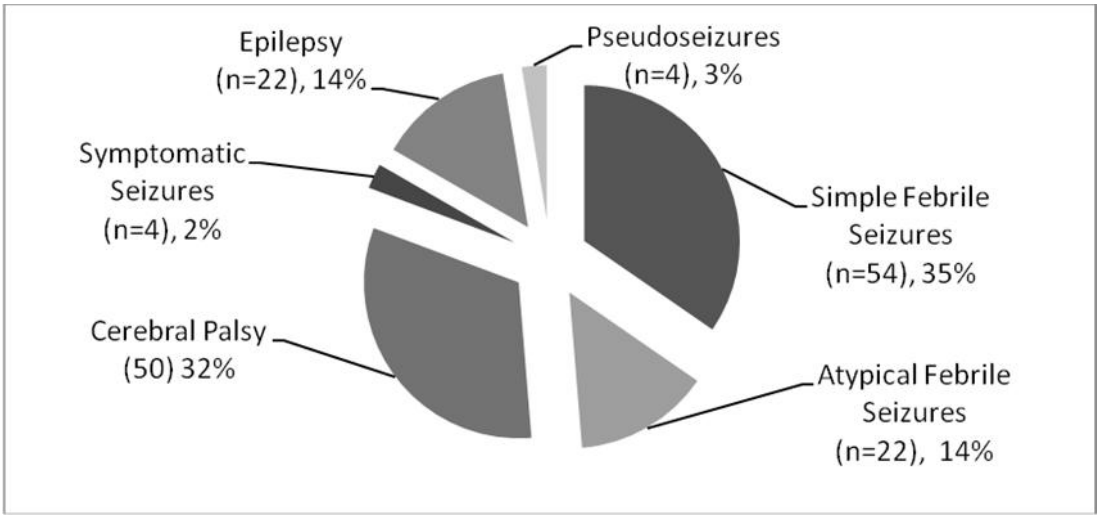

Table 2- Neuroimaging profile of various diagnoses of seizures

Seizure Diagnosis		Neuroimaging			
		Normal	*Abnormal*	*Not done*	*Total*
Simple febrile seizures	Count	5	0	49	54
	%	16.6%	0%	60.6%	34.6%
Atypical febrile seizures	Count	3	0	19	22
	%	10%	0%	23.4%	14.1%
Cerebral palsy	Count	2	43	5	50
	%	6.7%	95.6%	6.2%	32%
Symptomatic seizures	Count	2	1	1	4
	%	6.7%	2.2%	1.2%	2.6%
Epilepsy	Count	15	1	6	22
	%	50%	2.2%	7.4%	14.1%
Pseudo seizures	Count	3	0	1	4
	%	10%	0%	1.2%	2.6%
Total	Count	30	45	81	156
	%	100.0%	100.0%	100.0%	100.0%

DISCUSSION

The present study was a retrospective analysis of seizure disorders in children presenting in the paediatric department of Yenepoya Medical College, Mangalore between January 2011 and December 2013. High rate of incidence was in the age group of less than three years of age as found in previous studies[(1)]. Similar to other studies males had higher prevalence compared to females though not within significance range in this study. [(16, 17)] Our analysis of seizure types also revealed GTC as the most common in concordance with other studies. [(9, 18-21)]

The most common aetiology was febrile seizures as in other studies [(9, 22)] accounting for almost two thirds of the children presenting with seizures. Also, similar to previous studies [(6, 23)] we had

only few cases of electrolyte and metabolic disturbances – single cases of hypocalcaemia, hyponatremia and hypoglycaemia each. There was also only one proven case of meningitis among symptomatic seizure group in our study while other studies had more numbers of meningitis, malaria, neurocysticercosis, metabolic disorders as important etiological factors of seizures in children.[24] Our study had a large number of cerebral palsy cases presenting with seizures and this was due to the large referral of such cases for neuroimaging to our hospital probably due to the low cost of neuroimaging. Other than in certain studies focusing on seizure disorder in cerebral palsy, [10, 11] this high proportion of cerebral palsy was not found in common epidemiological studies.

The etiological yield of neuroimaging in an acute episode of seizure is unclear from the literature.[18, 25] In our study, though sixty percent of cases out of 75 for whom neuroimaging done showed positive neuroimaging findings, majority of them were accounted by cerebral palsy with features consistent with changes in cerebral palsy etiology. Remaining 30 (out of 75) cases were normal which was consistent with other studies.[26] Neuroimaging has a very poor yield in febrile seizure and is not recommended and the same thing was observed in our eight cases in which imaging was done to address parental apprehension. Though AAP recommends lumbar puncture (LP) in first episode of simple febrile seizure in infancy to rule out infectious causes,[27] we were only able to perform LP and CSF analysis in nine infants of which one CSF analysis was consistent with bacterial meningitis and remaining eight were normal. There were many misconceptions and false beliefs about LP in this region which hindered us from performing this procedure in many other warranted cases.

The limitations of study include that of being a retrospective study. The inclusion age group spanned a wide range and meaningful inter age group comparisons could not be performed. Further follow up of all the study patients could also not be done.

CONCLUSION

Seizures are a common presenting symptom in the paediatric casualty and simple febrile seizures accounted for majority of cases in developmentally normal children. The yield of neuroimaging is low in such cases and is only warranted when associated with developmental and neurological abnormality.

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