

**DO ALL THE CHILDREN WITH FEBRILE SEIZURES NEED AN EEG?**Dr. Shayla Imam Kanta\*<sup>1</sup> and Dr. A. Z. Moshiul Azam<sup>2</sup><sup>1</sup>Assistant Professor, Department of Pediatric Neuroscience, Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh.<sup>2</sup>Associate Professor, Department of Pediatric Neuroscience, Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh.**\*Corresponding Author: Dr. Shayla Imam Kanta**

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Article Received on 12/04/2021

Article Revised on 02/05/2021

Article Accepted on 23/05/2021

**ABSTRACT**

**Background:** Electroencephalography (EEG) is not indicated in the diagnosis of febrile seizures (FS). In general, paediatric practice, information about its role in the assessment is often unclear and EEGs are frequently ordered. This study determines the usefulness of history and clinical presentations of children with febrile seizures, in predicting the likelihood of an abnormal EEG. **Objectives:** To ascertain the rational use of EEG in FS and predict the clinical profiles of patients who should undergo this investigation. **Methods:** This is a retrospective study of one year, January 2018-december 2018 of children with febrile seizures who were admitted in Dhaka Shishu Hospital. Inclusion criteria was all the cases of febrile seizures who were advised for EEG, known cases of epilepsy, encephalitis and meningitis were excluded from the study. The relationship between clinical variables such as age of presentation, timing of the EEG since the occurrence of the FS, family history of seizures, neurological signs, and EEG abnormalities, were analysed. **Result:** Results of approximately 100 children will be presented. They will show that clinical variables at presentation can be used to screen children with febrile seizures for whom an EEG should be considered. This may lead to better use of resources. **Conclusion:** The precise role of EEG in evaluation of patients with FS has not been established, however some clinical variables like positive family history, types of seizures and eventful birth history.

**INTRODUCTION**

Febrile seizures (FS) are always considered as the commonest benign convulsive event in children less than 5 years of age.<sup>[1,2,3]</sup>

Electroencephalography (EEG) is not indicated in the diagnosis of simple febrile seizures (FS). In general paediatric practice, information about its role in the assessment is often unclear and EEGs are frequently ordered. The reported incidence of EEG abnormalities in children with febrile seizures (FS) varies from 2 to 86%.<sup>[4,5,6,7,8]</sup>

A wide difference is due in part to the definition of the EEG abnormalities, the time elapsed from the febrile seizure, and the age of the patient at the time of the EEG.<sup>[1,2,4]</sup> Contribution of febrile seizure on the management of febrile seizure is always controversial. This study determines the usefulness of history and clinical presentations of children with febrile seizures, in predicting the likelihood of an abnormal EEG. The objective is to ascertain the rational use of EEG in FS and predict the clinical profiles of patients who should undergo this investigation

**OBJECTIVE**

To ascertain the rational use of EEG in FS and predict the clinical profiles of patients who should undergo this investigation.

**METHODOLOGY**

The observational study which was done from January 2018-December 2018 in Dhaka shishu (children) hospital. All the data were collected from neurology clinic files, and hospital medical records to confirm the inclusion criteria and the diagnosis of FS. Age limitation was 3 month to 5 years with presence of febrile seizure (both simple and complex) who had EEG. The children who had an afebrile seizure, encephalitis, meningitis were excluded from the study.

Details such as age, sex, birth history, the time of first seizure, family history of febrile seizures, seizure semiology, EEG results were noted. EEG patterns were categorized as normal or abnormal on the basis of : (a) abnormality in the background rhythms (b) the presence of epileptiform activity (sharp waves, spikes, and/or spike wave complexes) or both. All the EEG recordings included awake and sleep states and had been read by a paediatric neurologist. During the analysis abnormal background and presence of epileptiform activities were included in the abnormal group. Ethical clearance was taken from ethical clearance committee. Informed

written consent was taken from the parents or caregiver. Statistical data were analyzed by SPSS method and qualitative data were analyzed by chi-square test.

## RESULTS

In this study 60 children with the diagnosis of FS were included with EEG findings.

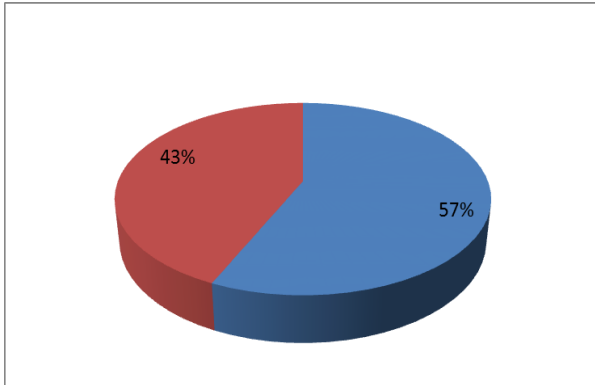


Figure 1: Types of febrile seizures.

Fig 1 shows types of febrile seizure in the study population. 57% of cases of simple FS and 43% of complex febrile seizures cases were taken.

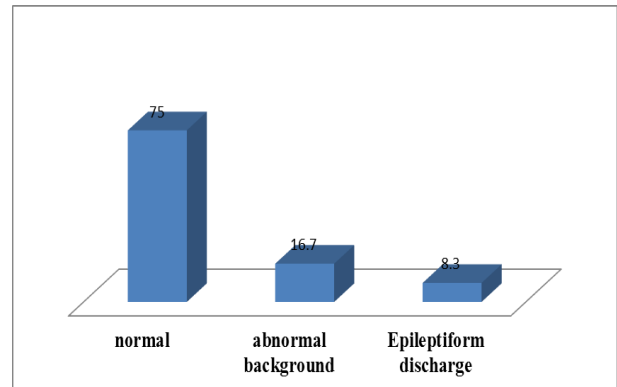


Figure II: EEG findings.

Fig II shows EEG findings of the study population. 75% cases had normal EEG findings, 16.7% had Abnormal background, 8.3% had epileptiform discharges.

Table I: Association and relation of baseline characteristics (n=60).

Row total		Normal EEG	Abnormal EEG (row total)	P value
Sex	Male	22(59.46%)	14(60.86%)	0.566
	Female	15(40.54%)	9(39.13%)	
Birth history	Eventful	6(16.21%)	11(47.82%)	*0.02
	Uneventful	31(83.78%)	12(52.18%)	
Residence	Rural	9(24.32%)	15(65.21%)	0.539
	Urban	28(75.67%)	18(34.78%)	
Consanguinity	Present	12(32.43%)	4(17.39%)	0.164
	Absent	25(67.56%)	19(82.60%)	

P value < .05

Among the study there were 36 children were male and 24 were female. EEG abnormalities were not significant in residence, sex, consanguinity. Eventful birth history showed significant EEG abnormalities. (Table II)

Table II: Age distribution.

Year	Frequency	Percentage
<1yr	23	38.3
1-2 yrs	13	21.17
2-3yrs	9	15
3-4yrs	10	16.7
4-5 yrs	5	8.3
Mean- 2.3 median-2, Mode-1		

Among the study population 38.3% in < 1 year of age, 21.17% was in 1-2 years of age group, mean age was 2.3 median was 2 and mode was 1 (Table II)

Table III: Association of seizure semiology.

Row total		Normal EEG	Abnormal EEG	Pvalue
Family history	positive	6(16.21%)	11(47.82%)	*0.03
	Negative	31(83.78%)	12(52.18%)	
Duration of seizure	<5 min	12(32.43%)	6(26.08%)	.412
	>5 min	25(67.56%)	17(73.91%)	
Recurrent rate	High	27(72.97%)	12(52.17%)	0.08
	Low	10(27.02%)	11(47.82%)	
Types of seizures	Generalized	35(94.59%)	1(4.34%)	*.01
	Focal	2(5.4%)	20(86.95%)	
	unclassified	1(2.7%)	2(8.69%)	

P value < .05

In seizure semiology some important findings were observed in normal and abnormal EEG groups. Positive family history, and types of seizure had significant association with EEG abnormalities. (Table III)

## DISCUSSION

The role of EEG in febrile seizure is always controversial. There are lots of studies in this regard where different conclusions have been observed. In this study 57% of cases of simple FS and 43% of complex febrile seizures cases were taken. Which is similar with other study. Hauser and Annegar reported ratio of simple and complex febrile seizure is 1.4:1<sup>[1]</sup> EEG finding was also different. 75% cases had normal EEG findings, 16.7% had abnormal background, and 8.3% had epileptiform discharges. Predominantly posterior background abnormalities were reported in as many as a third of the patients, generally within the first week after the seizure, and best appreciated in the awake EEG.<sup>[5,9]</sup>

In the study 36 children were male and 24 were female. EEG abnormalities were not significantly associated with residence, sex, consanguinity. Eventful birth history showed significant EEG abnormalities. Among the study population 38.3% in < 1 year of age, 21.17% was in 1-2 years of age group, mean age was 2.3 median was 2 and mode was 1. In seizure semiology some important findings were observed in normal and abnormal EEG groups. Positive family history, and types of seizure had significant association with EEG abnormalities. Charuta et al shows similar study on complex febrile seizures and got some clinical variables like positive family history, age of 1<sup>st</sup> seizures, prolonged seizures, seizure types as significantly associated with abnormal EEG as we got eventful birth history, positive family history & types of seizures as statistically significant for EEG abnormalities.<sup>[4,10]</sup>

## CONCLUSION

The precise role of EEG in evaluation of patients with FS has not been established, however some clinical variables like positive family history, types of seizures and eventful birth history and specially clinicians assessment for selecting patients to do EEG may limit its indiscriminate use.

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