

# Febrile Seizure Preventive Treatment for Recurrences

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**Abstract:** Febrile seizures, the most common type of seizures in infants and young children under 5 years. It continues to be the subject of intense interest and controversy among physicians about the treatment. **Aim:** This study was designed to identify which is the best method of treatment of Complex Febrile Seizure with intermittent or continuous prophylaxis with AED. **Materials & Methods:** 106 children with diagnosis Febrile seizure Complex were included. Patients was divided in 2 groups. First group patients with intermittent prophylaxis treatment Diazepam and antipyretics during fever and second group patients with prophylactic therapy AED. Treatment duration 1 year. All the patients were followed up for 3 years for any new seizure occur. All data were analyzed by SPSS **Results:** No significant statistical difference was found between both groups regarding the rate of seizure relapse during follow up. It is found that presence of significantly abnormal EEG in the group treated without AED. **Conclusion:** As a conclusion regarding the treatment of Complex Febrile Seizure first we must evaluate the balance risk-benefit regarding AED treatment. EEG monitoring in children with Complex Febrile Seizure is recommended because in our study we found a correlation between abnormal EEG and seizure relapse.

**Keywords:** complex febrile seizure, epilepsy, antiepileptic, EEG

## Abbreviations:

AED - Antiepileptic

EEG – Electroencephalography

## 1. Introduction

Febrile seizure is the most common type of seizure in children under 5 year. They are still subject of interest between pediatricians about the way of treatment. Although generally they are considered benign, they are extremely upsetting to the parents, because the high rate of recurrence. The American Academy of Pediatrics (1999) recommends no treatment for children with a simple febrile seizure. Regarding Complex Febrile Seizures still there is a dilemma, to treat or no treat with antiepileptic (AED) prophylaxis. That dilemma because in one hand we know side effects of AED but in other hand the discussion is about the risk of prolonged febrile seizure cause to the brain. The animal data suggest that a seizure lasting 20 minutes can produce long-lasting physiological changes [23]. If we had treatments that did not simply suppress seizures but prevented epilepsy, then the risk-benefit analysis may be quite different. Some antiepileptic drugs, notably Phenobarbital and Valproate, can be effective in reducing the risk of recurrent febrile seizures.

Factors which may influence the approach to antiepileptic treatment of febrile seizures include:

- They are extremely upsetting to the parents.
- High recurrence rate (30-40%) [2-4].
- Increased risk of subsequent epilepsy.
- Febrile status epilepticus.
- Risk of developing hippocampus sclerosis and temporal lobe epilepsy.

## 2. Aim

This study was designed to identify which is the best method of treatment of Complex Febrile Seizure, intermittent treatment or continuous prophylaxis with AED.

## 3. Materials & Methods

The present prospective study was conducted during the period from June 2009 to July November 2011. We analyzed 106 children with diagnosis Complex Febrile seizures. Children with Simple Febrile Seizure were excluded from the study.

### Exclusion Criteria

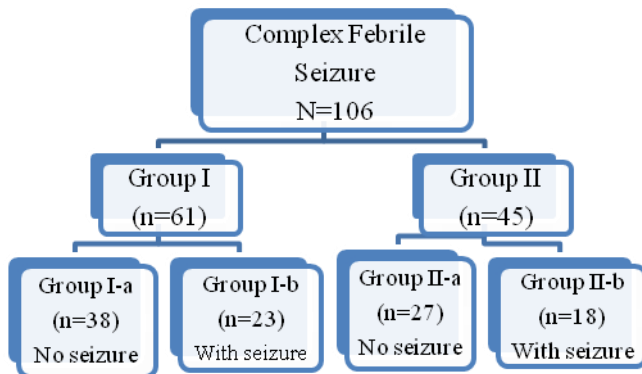
- Children with simple febrile seizure.
- Children who had made earlier afebrile seizures
- Children with abnormal neurologic examination.
- Children with abnormal brain imaging data.
- Children CNS infection.

We classified as Complex febrile seizure children with the following features (Commission 1993): (1) partial onset or focal features during the seizure, (2) prolonged duration >15 minutes [5-21] or (3) recurrent febrile seizures within 24 hours of the first episode [1]. In our study we analyzed several factors: age, sex, positive family history for febrile seizure, type of seizures, number of seizures and EEG data [4].

The patients were divided in to groups. In first group 65 children treated with Diazepam and Antipyretic during fever

and in second group 41 children was treated with AED for one year.

Prior to decide in which group will classify each of the children, their parents were clarified about advantages and disadvantages between groups of treatment and risk-benefit balance ratio. That unequal division was done after they took in consideration several factors such as the fact that some parents were against a long-term treatment due to fear of side effects of drugs, or otherwise some other parents were in favor of long term medication because they feared that it could face whether the child would make seizures and fears of possible complications. All the patient was followed up for 3 years after AED withdraw for any new seizure occur.



**Figure 1:** Division of patients by group

### 3.1 Statistical Analysis

All data were collected using the (Data Collection Form) and entered into a computerized database. Data obtained from all patients were statistically analyzed. P-value < 0.05 was considered statistically significant. Data was analyzed by using SPSS.

## 4. Results

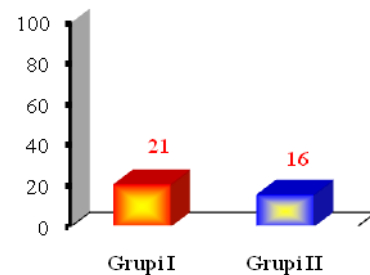
**Table 1:** Characteristics of the patients studied.

Characteristics of the patients studied (n=106)	
Age (month)	3-60
Mean	21.2
Gender	
Male	61 (57%)
Female	45 (43%)
Positive family history	24 (22.6%)
EEG abnormal	32 (30.2%)
Type of seizures	
Partial	90 (84.9%)
Generalized	16 (15.1%)
Without AED	61 (57%)
With AED	45 (43%)

Table 1, shows the characteristics of the patients studied. Age of the 106 patients included in the study was 3-60 months. The highest number of patients were male 61/106 (57.5%) and 45/106 (42.5%) female. 22,6% of patients have reported positive family history of febrile seizures. 30.2% resulting in abnormal EEG data. Partial seizure in 84.9% of patients and generalized seizures in 15.1%.

**Table 2:** Risk for relapse by groups

	The number of patients that have made seizures in following 3 years according to total group of patients				
	Group I		Group II		P
	N	%	N	%	
With seizure	23	21%	18	16%	0.34



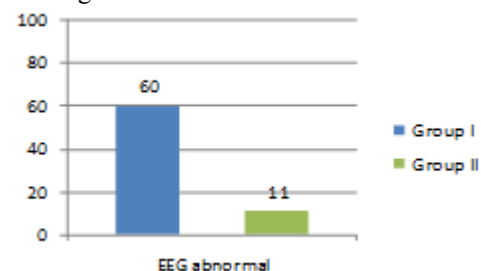
**Figure 2:** Risk for relapse

Risk of recurrence after cessation of treatment 16% in group treated with AED and 21% in group treated without AED. Different studies shows risk for recurrence 30-40%. [2-4]

**Table 3:** Follow up during 3 years after cessation of treatment.

Correlation of the parameters between the two groups during 3 years after cessation of treatment					
	Group Ib N=23		Group IIb N=18		P
	N	%	N	%	
Gender					
Male	13	56.5	10	55.5	0.94
Female	10	43.5	8	45.5	0.89
Positive family history	8	34.8	5	27.8	0.64
EEG abnormal	14	60%	2	11%	<b>0.002</b>
Type of seizures					
Generalized	5	21.8	3	16.6	0.67
Partial	18	78.2	15	83.4	0.68

In our study regarding EEG changes, we have noted a high risk for relapse (statistical significance). Figure no. 3 shows clear that change.



**Figure 3:** EEG changes between the two groups that did seizures during 3 years after cessation of treatment.

**Table 4:** Risk for relapse by treatment

Correlation between the two groups by treatment during 3 years after cessation of treatment					
	With seizure N=41		Without seizure N=65		P
	N	%	N	%	
Diazepam and antipyretic	23	56,09	38	58,46	0,81
Acid Valproic	10	24,39	14	21,53	0,73
Phenobarbital	8	19,51	13	20	0,95

In comparisons between the 2 groups we found small changes in favor of AED therapy but not statistically significant.

**Table 5:** Risk for relapse by age

Age (month)	Correlation between the two groups by age during 3 years after cessation of treatment				
	Group Ib N=23		Group IIb N=18		P
	N	%	N	%	
0-12	9	39,13	10	55,55	0.30
13-24	8	34,78	4	22,22	0.38
25-36	5	21,73	3	16,66	0.68
37-48	1	4,34	1	5,55	0.85
49-60	0	0	0	0	

In comparisons between 2 groups according to ages, we did not find statistically significant differences in terms of risk for relapse.

## 5. Discussion

In our study we found male domination. A slight predominance of males seen in other works [21]. Some authors attribute this to the dominance of males in the population but it is not seen in the works of Japanese authors (Tsuboi [25]. Fois et al. found ratio 55.15%-44.85% in favor of males [28].

The larger numbers of cases were aged under 12 months (44.3 %) slightly higher percentage than age 13-24 month (25.47 %). Approximate percentages are seen in other studies [24-27]. 25-36 month (18.86 %), 37-48 month (9.4%), 49-60 month (1,8%). We noticed that with increasing age reduces the risk for recurrence.

In our study we notice the two peak periods in the incidence of febrile convulsions, November-January (which corresponds to the peak viral infections affecting the upper respiratory tract, and July-August (period when gastrointestinal diseases are the most common. Similar data are described in the literature and in other studies [26].

Positive family history for Febrile Seizure was present in 22.6%. Other studies provide percentage 20% - 40% [15-17]. The risk of recurrence was 16% in group with AED and 21% in group without AED. Several studies provide risk for recurrence up to 44% [2-4].

Berg described possible risk factors for recurrence of Febrile Seizures: young age at onset (<18 months), lower degree of fever (<104°F (40°C)), and a positive family history of febrile seizures, the estimated risk of recurrence is only 15% for children with none of these risk factors and 27, 39, and 65% for children with one, two, and three risk factors [8].

However the rate of relapse depends on a number of factors relating to the study design different social and economic features.

A partial seizure was the most common type of seizures in our study 90(84.9%). We noted that the presence of a positive family history of febrile convulsions, the type of crisis had no effect as regards the risk for relapse.

In our study regarding EEG changes, we have noted a high risk for relapse (statistical significance).

Frantzen et al reported 29% in children abnormal EEG activity in a few years after febrile seizures. EEG recordings on the same day as the seizure have been reported to contain slow activity in as many of 88% of cases [29].

Rantala et al., found no difference in the early EEG recordings between in those with and without proved viral infection [30].

Another study with 676 children with febrile seizure EEGs were done from 7-20 days after illness. Abnormal EEGs were found in 22% [14].

Although it is not safe method in predicting the prognosis of febrile seizures, as a method of non-invasive, EEG it remains important for confirmation of electro cerebral changes as well as conditional predictor for the prognosis of febrile convulsions and the risk for epilepsy. In our study it was not identified any significant difference between the groups with and without AED regarding the risk for recurrence.

## 6. Conclusion

As a conclusion, AED treatment is not recommended in Simple Febrile Seizures. In Complex Febrile Seizures, antiepileptic treatment is not recommended unless cases with high risk factors that we mention in this study. EEG follow up for complex febrile seizures is important, because in our study EEG changes are related to the return of seizures.

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