



CLINICAL & LABORATORY CHARACTERISTICS OF FEBRILE SEIZURE IN CHILDREN AT TERTIARY CARE CENTRE, JHALAWAR

Pediatrics

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ABSTRACT

Background: This study was conducted to evaluate the clinical profile, gender predilection, risk of family history of Febrile Seizures or epilepsy and compare the lab parameters in children with Febrile Seizures and children with Febrile illness in a tertiary care hospital. **Method:** A descriptive prospective case control study done in Jhalawar medical college over a period of three months. It was composed of 100 children out of which 50 cases were with Febrile Seizures and 50 were Febrile illness without Seizures. **Result:** Out of 50 cases of febrile seizure 58% was male. 78% was simple febrile and 22% was atypical febrile seizures. Mean age of presentation was 22.8 months. Majority of children develop seizures within 6 hours after the onset of fever. URTI was the most common cause of fever in these children. **Conclusion:** Parent's counselling should be done for fever prophylaxis and about benign nature of disease. Children less than 2 years and with positive family history are at high risk.

KEYWORDS

INTRODUCTION:

Febrile seizure is the most common type of seizures seen in 2-5% of children aged below five years.¹ They are mostly benign with an excellent prognosis.² A seizure or convulsion is a paroxysmal, time limited change in motor activity and/or behavior that results from abnormal electrical activity in the brain. Attempts to identify factors associated with recurrence have been made and first episode of febrile seizure below 12 months, complex febrile seizure, family history and temperature below 40°C were found associated with the recurrence.³

METHODS:

This was a descriptive prospective study conducted at the Department of Pediatrics of Jhalawar Medical College and SHKBM hospital, Jhalawar from January 2020 to march 2020. 50 children in the age group from 06 months to 60 months diagnosed as Febrile Seizures as per the AAP Criteria admitted to this hospital were studied prospectively for clinical presentation including associated morbidity profile, risk factors and lab investigations. Further they were compared with 50 other children in the same age group presenting with febrile illness without seizures. Patients with prior episodes of afebrile seizures, abnormal neurodevelopment and age below six months and above five years were excluded from the study.

Simple febrile seizure was defined as generalized seizure, duration less than 15 minutes, single episode of seizure per febrile episode and occurring within 24 hour of onset of fever based on previous literatures.^{1,4} Febrile seizure that was focal, prolonged (≥ 15 minutes), and/or recurrent within 24 hours usually in the same febrile illness was classified as complex febrile seizure. Patient's demographic and clinical data regarding type of seizure, duration, number of episodes, interval from onset of fever to seizure, past episodes of febrile seizure, family history of febrile seizure and epilepsy and cause of fever were obtained.

All analyses were conducted using SPSS 25 Version. p value <0.05 was considered as statistically significant.

RESULTS:

In the present study 50 children with febrile convulsions diagnosed as per AAP criteria for febrile seizures were compared with 50 other children with febrile illness but without seizures in the same age group with respect to the clinical and laboratory profile.

Mean age of presentation was 22.8 months and the highest prevalence was reported among 13-24 months age group. Additionally, the study revealed that the age has an inverse relation with the prevalence of febrile seizure as the lowest prevalence was noted among 49 months and above age group (Figure 1)

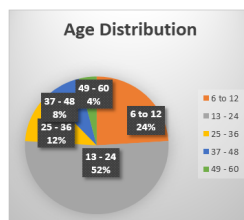


Figure 1: Age wise distribution

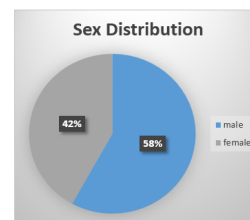


Figure 2: Sex wise distribution

There were 58% patients were male and 42% patients were female. Simple febrile seizure was observed in 39 (78%) children and complex febrile seizure was seen in 11 (22%) children. Generalized tonic clonic seizure was the predominant type of seizure which was seen in 36 (72%) children while generalized tonic seizure was seen in 13 (26%) children and only one child had focal seizure.

Most of the children 41 (82%) had single episode of seizure per febrile episode. Whereas 5 (10%) children had two episodes, 3(6%) children had three episodes and 1(2%) children had four episodes of seizures in the present febrile episode. Mean duration of seizure was 4.2 minutes and 43 (86%) children had seizure for five minutes or less duration. Majority of children developed seizure within 24 hours of onset of fever with mean of 9.2 (± 2.1) hours of onset of fever. Temperature of $\geq 38^\circ\text{C}$ was documented in 34 patients at presentation to the hospital and mean temperature was $38.4 (\pm 0.8)^\circ\text{C}$. 16% children had positive family history of febrile seizure and 4% children had history of epilepsy in family. Among the 50 children studied, 28% children had Second degree consanguinity, 12% children had 3rd degree consanguinity and remaining 60% were nonconsanguineous.

Upper respiratory tract infections were the most common cause of fever in children which was seen in 35 (70%) children. Other causes are shown in the Table 1.

Table 1: Cause of fever

Diagnosis	Frequency (N=50)	Percentage
Upper respiratory tract infection	35	70
Pneumonia	2	04
Acute gastroenteritis	5	10
Urinary tract infection	4	08
Ear infection	2	04
Other focus	2	04

In the study group 34 children had Anemia (68%). There are more number of children with low hemoglobin levels as compared to the

control group (21 children). This comparison is statistically significant with the P value-0.015.

There were significant number of children with Microcytic Hypochromic Anemia among the children with anemia in the study group. Further on comparison of the peripheral blood smear among cases and control group, more number of children had Microcytic Hypochromic anemia among the cases (31 children) when compared to control group (19 children). This comparison is statistically significant with a P Value – 0.036. (Table: 2)

Table – 2 comparison of Type of anemia in PBF

PERIPHERAL BLOOD SMEAR	CASES	CONTROL
MICROCYTIC HYPOCHROMIC	31	19
NORMOCYTIC NORMOCHROMIC	03	02
Total	34	21

There was no significant difference in the values of the total and differential leucocyte counts, serum calcium, serum electrolytes and random blood sugar values in the study and the control group.

Table – 4 Various parameter comparison

	CASES	CONTROL
TOTAL LEUCOCYTE COUNT		
NORMAL	38	39
ABNORMAL	12	11
TOTAL	50	50
SERUM ELECTROLYTE		
NORMAL	50	49
ABNORMAL	00	01
TOTAL	50	50
RBS		
NORMAL	50	50
ABNORMAL	00	00
TOTAL	50	50
SERUM CALCIUM		
NORMAL	48	49
LOW	02	01
TOTAL	50	50

DISCUSSION: In the present study the majority of cases were seen in the age group of 13-24 months. This age group is particularly susceptible for more chances of infection. As the age increases the incidence of febrile convulsions were less which can be explained by the fact that maturity and myelination of brain progressively increases. The mean age of children in this study was comparable to other studies.^{5,6} Simple febrile seizure (84% to 89%) is more common than complex febrile seizure (11% to 16%) in different studies worldwide^{7,8} which is comparable to this study.

Similarly the mean duration of seizure (4.2 minutes) was comparable with other study (5 minutes)⁷ while few studies showed higher mean duration of seizures (8-9.5 minutes).^{5,8} Majority of children in this study had single episode of seizure which was similar to previous studies.^{5,9} 16% children had positive family history of febrile seizure and 2 (4%) children had history of epilepsy in family. Studies by Nelson K.B & Ellenberg J.H¹⁰ has shown that children with febrile convulsions who have a positive family history of afebrile seizures was associated with a 3 fold increase in the rate of later epilepsy, as compared with those with no family history of seizure. Other studies by Lennox – Buchtal & Kurland E.T & Tsuboi, they have shown a positive family history of seizures, febrile or afebrile in about 10-40% cases of febrile seizures.¹¹

The present study is comparable to various other studies where in major etiology of fever precipitating febrile seizures were viral URI. Biochemical, hematological investigations and lumbar puncture for cerebrospinal fluid were performed when indicated clinically as per guidelines.¹ Blood counts and serum electrolytes were not found to be statistically significant in the children with febrile seizure, 18 (36%) patients were eligible for lumbar puncture, of which 14 (28%) children had normal cerebrospinal fluid analysis while 31% of patient required cerebrospinal fluid analysis in a previous study.⁵ However, lumbar

puncture could not be performed in 6 (12%) patients due to refusal by parents and the diagnosis of febrile seizure was made based on clinical observation.

In the present study there are significant number of children with pallor, low levels of Hemoglobin (68%) and Microcytic Hypochromic blood picture in peripheral blood smear indicating iron deficiency anemia (62%) among the study group when compared to that among the control group. Our study is comparable to other studies like in a study done by Leela Kumari et al, where in it has been shown that iron deficiency is a significant risk factor for simple febrile seizures.¹² In a similar study done by Hartfield et al, it was seen that children with febrile seizures were almost twice likely to have iron deficiency anemia as compared to children with febrile illness alone.¹³

Further in the present study RBS, Serum Calcium, Serum Electrolyte values were not significantly abnormal in the case and control group. In the study done by Carlos et al there was no abnormality in the above biochemistry test results.¹⁴ The AAP does not routinely recommend the above investigations in case of febrile seizures.

CONCLUSIONS:

Simple febrile seizure was most common type of febrile seizure and febrile seizure predominantly affected children below two years of age. Family history of febrile seizures and epilepsy may be a risk factor for development and recurrence of febrile seizures. It is recommended that parents of patients with febrile seizure should be appropriately counseled regarding seizure recurrence and measures during seizure activity as well as benign nature of illness; which might reduce parental anxiety during further episodes of febrile seizure. Immunization against Influenza A virus which routinely causes URI is recommended.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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