SHORT REPORT

Febrile seizrues: demographic, clinical and etiological profile of children admitted with febrile seizures in a tertiary care hospital

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Abstract

The hospital-based prospective study was conducted in Combined Military Hospital, Kharian, Pakistan, from January 2012 to December 2013, to determine the demographic, clinical and aetiological profile of paediatric patients admitted with febrile seizures. Patients clinically diagnosed as a case of febrile seizure were included in study. Patient's information was collected using a predesigned proforma. Out of total enrolled 100 children, 68(68%) were male and 32(32%) female. Mean age of the sample was22.58±12.50 months. Mean time interval between onset of fever and occurrence of seizures was17.68±12.09 hours. Overall, 78(78%) patients had simple seizures. Only 30(30%) patients had positive family history and 35(35%) had recurrence of seizures during the same episode of illness. Acute respiratory infection was the commonest cause for FS in 72(72%).Besides, 64(64%) patients were malnourished, 77(77%) had anaemia and 51(51%) had raised total leukocyte count.

Keywords: Febrile seizures, Aetiology, Age, Type, Anaemia, Pakistan.

Introduction

Febrile seizures (FS) are among the leading causes of paediatric emergency hospital admissions[1] and affect 2-5% of all young children.[2] Incidence is more in Asian countries and suggested explanation is that infections are more common in this age group in these countries.[3] The National Institute of Health (NIH) consensus statement defines a febrile seizure as "an event in infancy or childhood usually occurring between 3 months and five years of age associated with fever but without evidence of intracranial infection or defined cause for the seizure". The International League Against Epilepsy (ILAE) defines FS as "a seizure in association with a febrile illness in the absence of central nervous system (CNS) infection or acute electrolyte imbalance in children older than one month of age without prior afebrile seizure". FSs are generally divided into two groups: simple febrile seizures (SFS) and Complex FS(CFS) and rarely a third category called febrile seizure epilepticus in which seizure lasts more than 30 minutes without neurological recovery. FSss arise from a wide array of genetic and environmental factors though the main case for this disorder still needs to be recognised. Various risk factors are said to play a role in aetiology of FS are gender, developmental delay, breast-feeding duration, sudden high body temperature, maternal history of alcohol consumption/smoking, family history,[3] bacterial and viral infections,[4] certain vaccinations,[5] and iron and zinc deficiencies.[6] The recurrence rates of FSs vary in different parts of the globe.[2] Risk factors for recurrence are low fever at initial seizure and family history of afebrile seizures.[3]

The current study was planned to evaluate the demographic aetiological factors and defined laboratory indices associated with FS patients.

Methods and Results

The prospective hospital-based study was conducted in the Paediatrics Department of Combined Military Hospital (CMH) Kharian from January 2012 to December 2013. Children reporting in out-patient department (OPD)/emergency with seizure disorders were screened for FS. Those included were children aged 03-72 months admitted with FS diagnosis. Those with age <3months or >72 months, afebrile seizures, CNS infections, developmental delay, electrolyte imbalance, known cases of inborn error of metabolism and known cases of chronic diseases were excluded.

A sample of 100 patients was raised using non-probability (consecutive) sampling technique. The sample was irrespective of gender, race, ethnicity, geographical distribution and socioeconomic status. Informed written consent of parents and approval of institutional ethical committee were obtained. Data was collected using a predesigned proforma. SFS was defined as a generalised seizure with no focal seizure activity or focal manifestations during the postictal period, lasting less than 15minutes and not recurring within the next 24 hours or during the same febrile illness. A CFS was defined as a seizure with features suggestive of focal activity at the onset, during or in the postictal period or a seizure lasting more than 15 minutes or a seizure that recurred within 24 hours or within the

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Table-1: Demographic profile.

Parameter	Frequency/Percentage	Parameter	Frequency/Percentage
(1)Gender		**(5) Seizure type**	
Male	68	Simple	78
Female	32	Complex	22
(2)Age In Months		**(6) Family History**	
03-6 M	01	Nil	70
07-12 M	19	Present	30
13-18 M	16	(7) Episode Of Seizure	
9-24	27	One (single)	65
25-30	15	Recurrence	35
31-36	09	**(8) Nutritional Status**	
37-48	03	Well nourished	36
49-60	07	Malnourished	64
61-72	03		
(3)Time In Hours (between onset of fever and seizure)			
<12 hours	27	**(9) Anaemia confirmed by investigation**	
12-24	54	Present	77
25-36	04	Absent	23
37-48	10	**(10) TLC on investigation**	
>48	05	Normal	40
(4) Aetiology of fever	Raised	60	
ARI	72		
AGE	12		
Malaria	03	**NOTE: Frequency and percentage are the same**	
Otitis media	04		
Enteric fever	02		
UTI	07		

ARI: Acute respiratory infection. AGE: Advanced Glycation End products. TLC: Total leukocyte count. UTI: Urinary tract infection.

same febrile illness. Anaemia was defined as haemoglobin Hb% less than12gm/dl and total leukocyte count (TLC) >11x10^9/L was considered raised. Nutritional status was assessed according to Gomez classification.[7]

Data was analysed using SPSS 17. Frequency and percentage were calculated for qualitative variables like age, gender, family history, type of FS. Mean and standard deviation (SD) were calculated for quantitative variables like Hb% and age. P<0.05 was considered significant.

Of the 100 cases, 68(68%) were male and 32(32%) female with male-to-female ratio being 1.4:1. In terms of age, 63(63%) patients were in the 19-24 month group, and the mean age of the sample was 22.58±12.50 months. Only 30 (30%) patients had positive family FS history and 35(35%) had recurrence of seizures during the same episode of illness. Besides, 65(65%) patients had only one episode of seizure during the illness. Single-episode category patients had increased frequency of simple seizures. ARI was the commonest cause in 72(72%) patients; 77(77%) had anaemia and mean Hb% was 9.921.57gm/dl. Besides, 54(54%) patients had seizure between 13-24 hours since the onset of fever; and 78(78%) patients had simple FS (Table-1).

Table-2: Statistical comparison of seizure type with variou variables.

Variable	Simple	Complex	p-value
Gender			
Male	53	15	
Female	25	07	0.983
Age			
3-6 Months	01	00	
7-12 Months	18	01	
3-18Months	16	00	
19-24Months	16	11	
25-30Months	15	00	
31-36Months	05	04	
3.1-4years	02	01	
4.1-5years	04	03	
>5 years	01	02	0.000
Family History			
Nil	61	09	
Yes	17	13	0.001
Episode			
One(single)	58	07	
Recurrence	20	15	0.001
Aetiology			
ARI	61	11	
AGE	12	00	

Malaria	02	01	
Otitis media	02	02	
Enteric fever	00	02	
UTI	01	06	0.000
Nutritional Status			
Well nourished	31	05	
Malnourished	47	17	0.131
Anemia			
Nil	14	09	
Yes	64	13	0.031
TLC			
Normal	43	07	
Raised	35	15	0.128

ARI: Acute respiratory infection.
AGE: Advanced Glycation End products.
TLC: Total leukocyte count.
UTI: Urinary tract infection.

Statistical comparison of seizure type with various variables was also done (Table2). Age, family history, episode whether single or recurrent, aetiology and anaemia were significant variables ($p<0.05$ each).

Discussion

Our documented mean age of onset of seizures is consistent with various studies.[1,6,8,9] FS usually occurs within first 24 hours of onset of fever3and our study results are consistent with results of earlier studies.[10]

Nutritional status of the sample showed that majority had malnutrition, but one study[11] has reported no statistical significance between FS and malnutrition. This contrast may be attributable to differences in size, nature, ethnicity and socioeconomic conditions of the sample.

Regarding the type of FS, our results are in consistent with literature.[1,12] Major chunk of our sample had first episode of seizure and it is in line with results reported earlier.[13]

Regarding aetiological profile, our study results are again comparable with earlier studies.[1,6,14-16]

Conclusion

Majority of patients were male and presented within the first 24 hours of fever, with first episode and simple FS. Anaemia, malnutrition, raised TLC were found to be FS risk factors. Further studies are needed to assess the association of FS with malnutrition and bacterial infections.

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