

## Evaluation of Adult Onset Epilepsy and History of Childhood Febrile Seizures: An Institutional Study

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### ABSTRACT

**Background:** One of the common types of pathology associated with childhoods is the occurrence of febrile seizures. With the exception of some developing countries, causing of brain damage by the occurrence of febrile seizures (FS) is a common phenomenon. One of the most common diseases of the nervous system in the elderly is Epilepsy. Due to inheritance of a low seizure threshold, genetic predisposition has been observed in children with FS, for the occurrence of convulsions in association with fever. Hence; we planned the present study to assess the correlation between history of childhood FS and adult-onset epilepsy.

**Materials & Methods:** We assessed a total of 100 patients presenting with history of adult- onset unprovoked seizures. Collection of the detailed history of past and present illness of the patient was done. Personal interviewing of the patients was done for confirming the data in relation to childhood FS of all the patients. Patients were grouped into localized, generalized and undetermined epilepsy as very small number of patients represented with different types of epilepsy. Data records of all the patients were recorded and analyzed.

**Results:** The mean age of the patients included in the present study was 18.5 years. 36 patients were found to have Epilepsy syndrome with prior FS. In males, significantly higher incidence

of positive history of FS was seen in comparison to females. 22 patients showed the presence of partial seizures while temporal lobe epilepsies were present in 16 patients. Generalized epilepsies and Extra-temporal were seen in 10 and 5 patients respectively.

**Conclusion:** Significant correlation exists between occurrence of partial epilepsies and history of febrile seizures.

**Key words:** Epilepsy, Febrile, Seizures.

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### Article History:

Received: 05-03-2017, Revised: 28-03-2017, Accepted: 15-04-2017

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2017.3.3.021	

### INTRODUCTION

One of the common types of pathology associated with childhoods is the occurrence of febrile seizures. They can be extremely frightening, emotionally traumatic and anxiety provoking when witnessed by parents. One of the common perceptions of parents during the occurrence of seizures in their children is that their child is dying, but fortunately the vast majority of febrile seizures are benign.<sup>1</sup> With the exception of some developing countries, causing of brain damage by the occurrence of febrile seizures (FS) is a common phenomenon. There are no documented cases of febrile seizure-related deaths on record. There have been numerous reviews and updates which have explored the natural history, treatment and subsequent outcomes of FS.<sup>2</sup>

In relation to the parental reaction over period of time, several articles have addressed in the literature.<sup>3</sup> One of the most common diseases of the nervous system in the elderly is Epilepsy. In terms of frequency, it is only secondary to dementia and stroke. Geriatric epilepsy includes pre-elderly (<60 years old)

epilepsy continuing to old age stage, and new-onset epilepsy in the elderly. Epilepsy, especially late-onset epilepsy, significantly impacts the quality of life of older people and increases the health care resource burden on society.<sup>4</sup> In comparison to the subjects of other age groups; the incidence of epilepsy and seizures is higher in the elderly ( $\geq 60$  years old) than in other age groups.<sup>5</sup> Due to inheritance of a low seizure threshold, genetic predisposition has been observed in children with FS, for the occurrence of convulsions in association with fever.<sup>3</sup> Hence; we planned the present study to assess the correlation between history of childhood FS and adult-onset epilepsy.

### MATERIALS & METHODS

The present study was conducted in collaboration of the Department of Neurology and Department of General Medicine, KPC Medical College & Hospital, Jadavpur, West Bengal (India) and included assessment of 100 patients. No therapeutic

interventions or treatment were involved in the present study as it was totally an observational study. We assessed a total of 100 patients with history of adult onset unprovoked seizures. Separate recording of detailed history of all the patients was done. Collection of detailed past and present history of all the patients was done. Personal interviewing of all the patients was done for confirming the patients with childhood FS. Criteria described previously in literature were used for categorizing patients with Seizures.<sup>6,7</sup>

International classification of seizures and International Epilepsy and Epilepsy Syndromes were considered while classifying the seizure type and epilepsy and epilepsy syndrome.<sup>8,9</sup>

**Exclusion criteria for the present study included:**

- Patients with history of bacterial meningitis
- Patients with history of recurrent head trauma
- Patients with history of any brain tumour
- Lack of complete data on history of childhood FS event

Grouping of the patients was done into localization-related, generalized and undetermined epilepsy as the number of the patients with different epilepsy syndromes was small. All the results were recorded and analyzed by SPSSs software. Chi-square test and uni-variate regression curve was used for the assessment of level of significance. P-value of less than 0.05 was taken as significant.

**Table 1: Mean age and gender distribution of patients**

Parameter	Number
Mean age (years)	18.5
Males	72
Females	28
Patients with Epilepsy syndrome with prior FS	36

**Table 2: Distribution of patients with Epilepsy syndrome with prior FS**

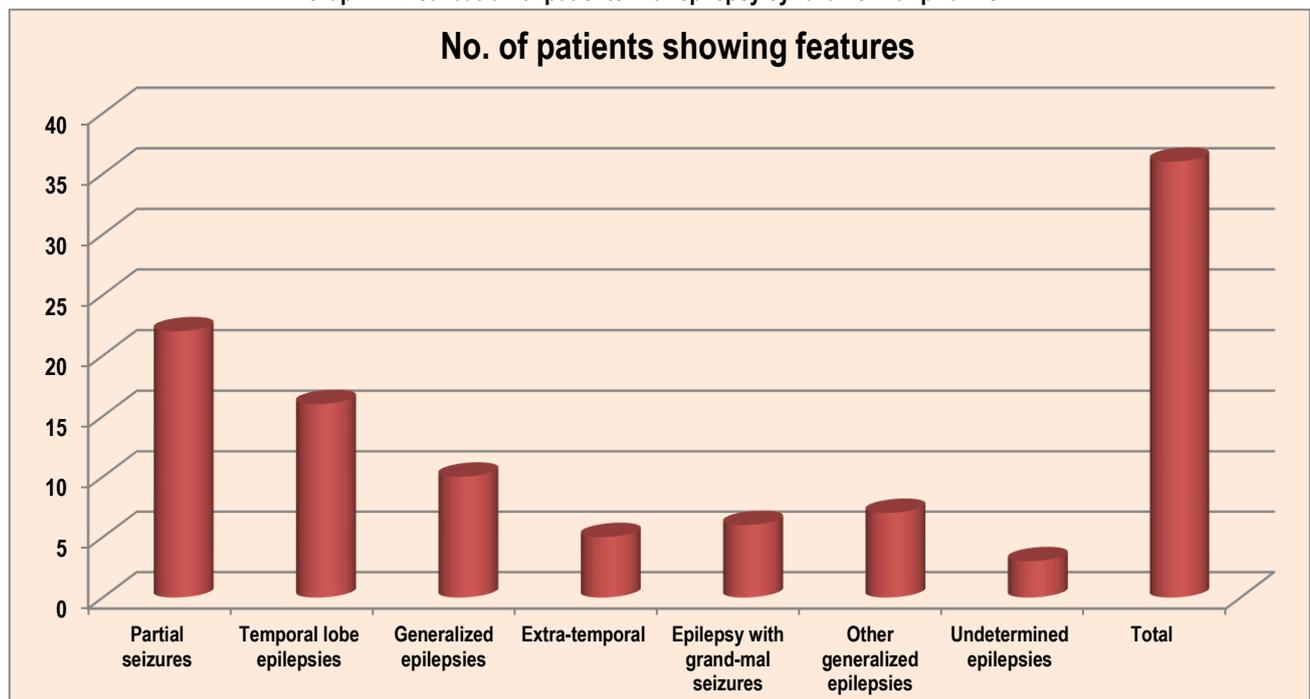
Gender	No. of patients	Percentage of patients	p-value
Males	27	75	0.02*
Females	9	25	
Total	36	100	

\*: Significant

**Table 3: Distribution of patients with epilepsy syndrome with prior FS**

Parameter	No. of patients showing features
Partial seizures	22
Temporal lobe epilepsies	16
Generalized epilepsies	10
Extra-temporal	5
Epilepsy with grand-mal seizures	6
Other generalized epilepsies	7
Undetermined epilepsies	3
Total	36

**Graph 1: Distribution of patients with epilepsy syndrome with prior FS**



## RESULTS

The mean age of the patients included in the present study was 18.5 years (Table 1). Out of 100 patients, 72 were males and 28 were females. 36 patients were found to have Epilepsy syndrome with prior FS. In males, significantly higher incidence of positive history of FS was seen in comparison to females (P-value <0.05) (Table 2). Out of 36 patients with Epilepsy syndrome with prior FS, 27 were males and 9 were females. Table 3 and Graph 1 shows the distribution of patients with epilepsy syndrome with prior FS. 22 patients showed the presence of partial seizures while temporal lobe epilepsies were present in 16 patients. Generalized epilepsies and Extra-temporal were seen in 10 and 5 patients respectively. Epilepsy with grand-mal seizures and other generalized epilepsies were present in 6 and 7 patients respectively. Only 3 patients showed the presence of undetermined epilepsies.

## DISCUSSION

Less than 5 percent of all the children are reported to be suffering from FS. Very few studies are quoted in the past literature that highlights patients with FS and their epidemiological data.<sup>10</sup> Various chromosomal abnormalities have been proposed to be linked with development of FS.<sup>11</sup> Hence; we planned the present study to assess the correlation between history of childhood FS and adult-onset epilepsy.

In the present study, we observed that 36 percent of the total patients had epilepsy syndrome with prior FS (Table 1). Also, a significantly higher proportion of males were observed in this patient group. Among these patients, more than 60 percent of the patients were having Partial seizures (Table 3). Mohebbi et al assessed the association between adult-onset epilepsy and history of childhood febrile seizures (FS). Records of 101 consecutive adults who were referred to the hospital with adult-onset seizures were reviewed and the patients and their families were interviewed to assess the medical history. Of the 101 patients, 9 were excluded for reasons of bacterial meningitis, recent head trauma, brain tumor, tricyclic antidepressants' overdose and missing reliable data of the childhood FS event. Thirty-one of the remaining 92 patients had history of FS in the childhood. Localization-related epilepsies and partial seizures seem to be associated with a history of FS in childhood. This warrants more investigation to understand the mechanism as well as a possible pathology common in both localization-related epilepsies and FS in the affected probands.<sup>12</sup>

Berg et al prospectively identified cohort of children, the association between prior febrile seizures and characteristics of the children's epilepsy were examined for 524 of the children who were aged > or =1 year at onset of epilepsy. Seventy-three (13.9%) had febrile seizures. Children with febrile seizures were more likely to have a first-degree or a second-higher-degree relative with febrile seizures and less likely to have childhood absence epilepsy and absence seizures compared with children without febrile seizures. This was especially true for simple febrile seizures. There was no specific association with localization-related forms of epilepsy. Complex, but not simple, febrile seizures were associated with younger age at onset of epilepsy. There was no evidence that focal or prolonged febrile seizures were associated with localization-related epilepsy or temporal lobe epilepsy per se. Of the three children whose initial MRIs

demonstrated hippocampal atrophy, none had a history of febrile seizures. At the time of diagnosis, febrile seizures are not specifically related to temporal lobe epilepsy or localization-related epilepsy in general. A genetic component for febrile seizures is suggested by its positive associations with family history, especially for simple febrile seizures. Complex febrile seizures represent an underlying age-dependent susceptibility.<sup>13</sup>

Durá-Travé et al reviewed the records of 234 children who had had their first seizure between 1989 and 1996; epidemiological, clinical and developmental data were collected. Patients at neurological risk were excluded. Patients were divided into two groups according to whether they had their first FS before or after reaching the age of 15 months. The mean age at the first FS was 20.6 +/- 8.9 months, being higher in children with a single FS and lower in those who had relapses and epilepsy. The male/female ratio was 1.09 in the smaller group and 1.96 in the larger group. The risk of relapses was 73.9% in the smaller group and 33.1% in the larger group, and in both groups it increased if there was a history of FS or epilepsy in the family. The risk of epilepsy was 11.6% in the smaller group and 3.0% in the larger group, but it increased in the smaller group if the first FS or relapses were complex. From the results, they concluded that prognosis of the patients with FS is affected by the age of first FS.<sup>14</sup> Xi et al inquired and physically examined for the probands of the 15 pedigrees of generalized epilepsy with febrile seizures plus (GEFS+). Some patients received electroencephalography, cranial CT or MRI examination. The seizures and epilepsy syndromes were classified according to the 2001 Seizure International Classification. The clinical data of GEFS+ were reviewed. The 15 families consisted of 196 individuals. Seventy-five individuals were confirmed with epilepsy. The phenotypes of 64 out of the 75 patients with epilepsy conformed to GEFS+. The 64 patients included 38 males and 26 females (1 deceased) and there was no gender difference in the morbidity of GEFS+. The age at onset was all in childhood. GEFS+ had a diversity of phenotypes. Febrile seizures (FS) were confirmed in 44 patients, FS and myoclonic seizure in 1, febrile seizures plus (FS+) in 13, FS+ and absence seizure in 2, FS+ and myoclonic seizure in 1, and FS+ and focal seizure in 3. The heterogeneity of phenotypes and genetics may be the hallmarks of GEFS+. FS and FS+ are common phenotypes while FS+ and absence seizure, FS+ and myoclonic seizure, and FS+ and focal seizure are rare.<sup>15</sup>

## CONCLUSION

From the above results, the authors concluded that a significant correlation exists between occurrence of partial epilepsies and history of FS. However, future investigations are required for better understanding the mechanism and association between the two factors.

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**Source of Support:** Nil. **Conflict of Interest:** None Declared.

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**Cite this article as:** Reshma Dutt (Saha). Evaluation of Adult Onset Epilepsy and History of Childhood Febrile Seizures: An Institutional Study. *Int J Med Res Prof.* 2017; 3(3):98-101. DOI:10.21276/ijmrp.2017.3.3.021