Original Article

A survey on febrile seizures at the Lady Ridgeway Hospital for Children

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Abstract

Objectives To evaluate demographic, clinical and management aspects of febrile convulsions.

Method A prospective study was carried out on all children admitted to Lady Ridgeway Hospital with a diagnosis of febrile convulsions during June and July 2002. Children with a history of afebrile seizures and those with evidence of a neurodevelopmental deficit or central nervous system infection were excluded. Data was obtained from medical records and direct interview of parents/guardians of children with febrile convulsions using a pre-tested validated questionnaire.

Results 330 children were admitted with febrile convulsions. Male to female ratio was 3:2. The mean age was 22 months. Approximately 25% had a history of febrile convulsions in first degree relatives. 25% had complex febrile seizures. 80% of seizures occurred within 24 hours of the onset of fever. 24 (7%) children received long term prophylaxis for recurring febrile convulsions. Upper respiratory tract infection was the commonest trigger factor. 48% of the parents/guardians did not have a satisfactory knowledge of first aid.

Introduction

The International League Against Epilepsy (ILAE) defines a febrile seizure as "a seizure occurring in childhood after one month of age, associated with a febrile illness not caused by an infection of the central nervous system, without previous neonatal seizures or a previous unprovoked seizure, and not meeting criteria for other acute symptomatic seizures".

Febrile seizures recur in 30-40%[1], risk of subsequent epilepsy is low[2] and the neurological outcome is excellent[1]. There appears to be a dearth of published studies on febrile convulsions in Sri Lanka. The aim of this study was to evaluate demographic, clinical and management aspects of febrile convulsions.

Method

All children admitted to Lady Ridgeway Hospital (LRH) with a diagnosis of febrile convulsions were prospectively studied during June and July 2002. Children with a past history of afebrile seizures and those with evidence of a neurodevelopmental deficit or central nervous system infection were excluded. Data was collected, using a pre-tested validated questionnaire, from medical records and direct interview of parent/guardian of children with febrile convulsions.

Simple febrile seizures were defined as generalised seizures lasting less than 15 minutes and which did not recur within a day. Complex febrile seizures were defined as focal or multiple seizures or seizures with duration >15 minutes or a combination of these.

Results

Three hundred and thirty (3%) of all admissions to LRH were due to febrile convulsions. Male to female ratio was 3:2. Thirty nine percent of children with febrile seizures were less than one year of age. The mean age was 22 months. In 1.5% onset was after 5 years of age. In 2% febrile convulsions persisted beyond 5 years (Table 1). Approximately 25% had a history of febrile convulsions in first degree relatives. Only 4 (1.2%) children with febrile seizures had a positive family history of epilepsy in first-degree relatives (Table 1).

Seventy five percent had simple and 25% had complex febrile seizures. 29% of infants showed atypical seizures. Among children who had complex seizures 88% had multiple seizures, 5% had focal seizures and 17% had prolonged seizures (lasting more than 15 minutes). In 59% the first seizure was the longest. 80% of seizures occurred within 24 hours of the onset of fever (Table 2).

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Table 1 - Demographic data

Data	No. (%)
Age distribution (current episode)	
<12 months	129 (39)
13-60 months	194 (59)
> 61 months	07 (02)
Sex distribution	
male	198 (60)
female	132 (40)
Family history (first degree)	
F?H of febrile convulsions	82 (25)
F/H of epilepsy	04 (01)
Past history (total=135)	
1 febrile convulsions	65 (48)
2 febrile convulsions	35 (26)
3 febrile convulsions	16 (12)
4 febrile convulsions	12 (09)
>=5 febrile convulsions	07 (05)

Table 2 - Seizure characteristics

Characteristics	No. (%)
Atypical seizures (n=83)	
multiple	73 (88)
focal	04 (05)
prolonged	14 (17)
Onset of seizure	
Within 24 hr of fever onset	66 (20)
After 24 hrs	264 (80)
Longest seizure	
first	194 (59)
second	92 (28)
third	30 (09)
fourth	07 (02)
>fifth	07 (02)

Fifty seven (17%) children had been given anticonvulsants prior to hospital admission either by a general practitioner or at the outpatient department and 4 of those children received diazepam intramuscularly (Table 3). Although 15 children had been prescribed short course diazepam prophylaxis, only 2 of them were given diazepam by their parents with the current febrile illness. Twenty four (6.7%) children received long term prophylaxis for recurring febrile convulsions, 67% with sodium valproate and 25% with carbamazepine (Table 3).

Upper respiratory tract infection was the commonest trigger factor, diagnosed in 36% of cases. Other trigger factors included lower respiratory tract infections, otitis media, acute gastro-enteritis and urinary tract infections (Table 4). Forty eight percent of the parents/guardians did not have satisfactory knowledge on first aid.

Table 3 - Treatment

Management	Number
Acute management before admission(n=60)	
Diazepam	
Per rectal	51
Intramuscular	04
Paraldehyde	
Intramuscular	04
Phenobarbitone	
Intramuscular	01
Prophylaxis (n=39)	
Diazepam oral	15
Sodium valproate	16
Carbamazepine	06
Phenorbarbitone	02

Table 4 - Aetiology of fever

Aetiology	Number (%)
Upper respiratory infection	118 (36)
Viral fever	110 (33)
Lower respiratory infection	59 (18)
Acute gastro-enteritis	26 (08)
Acute otitis media	06 (02)
Urinary tract infection	04 (01)
Other	07 (02)

Discussion

Febrile convulsions occur in 2-4% of children[3]. Although the incidence in Sri Lanka is not known, it is evident that febrile convulsions account for a significant proportion of morbidity and hospital admissions. In this study, age range of the population was 2 months to 11 years. One hundred and twenty nine (39%) were below one year of age. In 2% of children convulsions continued beyond 5 years of age while in 1.5% onset of febrile seizures was after 5 years of age. According to Webb *et al* only 10% developed epilepsy later on in this age category[4]. Twenty five percent had an affected first degree relative with febrile convulsions and it is comparable to the available information in the literature[5,6,7,8].

Twenty five percent had atypical febrile convulsions. It is useful to follow up these children to assess the prognosis. According to Annergers *et al* atypical seizures are predictors of subsequent epilepsy and the risk ranged from 2.4% among children with simple

febrile convulsions to 49% among children with all three complex features of febrile convulsions[2].

Twenty nine percent of infants had atypical febrile seizures. The most difficult part in evaluation is the decision regarding the need for a lumbar puncture in these infants. Because of the unreliability of the meningeal signs in small children several studies give various cut-off points ranging from 6 months to 36 months for the age below which a lumbar puncture is recommended[9,10.] Some studies indicate that children with complex seizures[11] and children pre-treated with antibiotics have the highest risk of bacterial meningitis. Therefore, individual clinical decisions should guide the need for lumbar puncture rather than arbitrary cut off points for age.

In this study the majority of children had a clinical diagnosis of viral infection. A minority were treated with antibiotics for lower respiratory tract infections, acute otitis media and urinary tract infections. These findings are compatible with available information[12].

It is noted that 4 children received diazepam intramuscularly in acute management highlighting the necessity for education of healthcare workers to avoid ineffective routes of diazepam administration.

Twenty four children with recurrent convulsions were on long term prophylaxis. Majority (16) of them were on sodium valproate while 6 of them were on prophylactic carbamazepine. A meta-analysis of all published randomised, placebo-controlled trials of the preventive treatment of febrile seizures shows that valproate and phenorbarbitone are effective in prevention of recurrences, but both agents have known adverse effects and cannot be recommended for prevention of febrile seizures[13]. According to this analysis no difference in risk was found for recurrences between children receiving intermittent diazepam and placebo[13]. Many studies have shown that phenytoin and carbamazepine have no place in prophylaxis [13,14].

Almost half of the parents did not have adequate knowledge on febrile convulsions highlighting the need for parental health education. There is evidence that, parents' poor knowledge, negative attitudes, anxiety, and inadequate first-aid measures toward febrile convulsions can be effectively improved by parent education[15].

Conclusions

- Febrile seizure disorder is an important health problem in Sri Lanka. Often it accounts for parental anxiety and childhood morbidity.
- According to many randomised controlled trials long-term prophylaxis is not recommended due to the side effects and should only be used in highly selected cases, if at all. Sodium valproate and phenorbarbitone are the drugs of choice. Intermittent diazepam prophylaxis has no proven effect[13,14].
- Parents need to be counselled and educated at the time of the seizure. A leaflet with important details can be useful to reduce the workload of the busy healthcare worker.
- Further studies are recommended to evaluate prognosis of atypical febrile seizures and febrile seizures with onset after 5 years of age. It is also important to look further at children less than one year with fever and convulsions, since there are difficulties in diagnosis and management.

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