Management of febrile convulsion: An update
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Introduction
Febrile convulsion is a common paediatric presentation in world wide including our country particularly in the child age group from 6 months to 5 years. In our country there is no definite data regarding incidence of febrile convulsion, though the magnitude of the problem is supposed to be definitely significant. In USA, the incidence is 3-4%1. The peak incidence is at 18 months2. In western and European country, about 4% of the febrile convulsion occurs in the first 6 month of life, 90% between 6 month and 3 years of age2,4. Prevalence in boys is slightly higher than girls5. In Europe and USA, there are update guide lines from 'Royal college of Physicians and British Paediatric Association, American Academy of Pediatrics' on regular basis published at regular interval regarding management of febrile convulsion in children. In our country that is yet to come. Physician should themselves acquire this updated knowledge regarding the management of febrile convulsion in children.

Definition
A febrile convulsion is a seizure occurring in a child age 6 months to 5 years, associated with fever arising from infections or inflammation outside central nervous system in a child who is otherwise neurologically normal6.

Types of febrile convulsion
1. Simple febrile convulsion: Most febrile seizure are isolated, generalized, tonic-clonic seizures lasting less than 15 minutes as it is not repeated during the same illness5.
2. Complex febrile convulsion: Last about 15-30 minutes or are focal or recur during the febrile illness or are not followed by full consciousness within an hour.

Mechanism of febrile convulsion
The mechanism causing febrile convulsion are not known. It may not be the fever that causes the seizures, but release of cytokines, is a consequence of infection that (a) cause fever and (b) cause seizures. The risk of febrile convulsion depends upon the age of the child, so reflecting maturational sensitivity to the cytokines with respect to seizure induction. Consequently much of the debate over the presence, height or rate of rise of fever may be irrelevant7.

Causes of febrile convulsion
A comprehensive review of the literature identified the conditions usually associated with febrile convulsion.3 genetic factors are important in the etiology of febrile seizures8. All infection which causes fever may be associated with febrile convulsion, but some infections are more prominent. Roseola infantum and shigella dysentery are said to be associated with particularly high risk of febrile seizures5.

In decreasing order of frequency they are-
- Viral infections
- Otitis media
- Tonsillitis
- Urinary tract infection

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Gastroenterities
Lower respiratory tract infection
Post immunization.

Criteria of febrile seizures
- Age: 6 months to 5 years old.
- Convulsion:
  - Duration: usually no longer than 3-6 minutes; class as complex of prolonged more than 10-15 minutes.
  - Pattern: usually generalized tonic-clonic; class as complex if focal.
  - Recovery of level of consciousness: usually complete within an hour; class as complex if not fully recovered within an hour.
- Temperature: Fever around the time of the convulsion.
- History of previous febrile convulsion: class as complex if convulsions recur in the same febrile illness.
- Recent immunization: It is rare for a febrile convulsion to precipitate by an immunization.
- EEG: Electroencephalogram (EEG) done within a week after a febrile convulsion may be abnormal but after a week it usually shows no abnormality.

Investigation
Investigations should be directed towards identifying the source of the fever.
- UTI: When no focus of infection is found and admission is not planned take a urine sample for microscopy and culture.
- Blood tests, electroencephalograms (EEGs) and neuroimaging are not required in the evaluation of simple febrile convulsions.

Criteria for admission
1. Most children with a first febrile convulsion do not need to be admitted: - The main concern is the possibility of missing a more serious diagnosis such as meningitis.
2. Strongly consider admission for observation, lumbar puncture or treatment if any of the following factors are present:
   - Age under 18 months (May have meningitis without meningeal signs).
   - Signs of meningitis (neck stiffness, photophobia, kernig's sign, brudzinski's signs, bulging fontanelle, depressed level of consciousness).
   - Child was drowsy before the seizure or is irritable, systemically unwell or "toxic".
   - Petechial rash
   - Recent or current treatment with antibiotics (because partially treated meningitis may not have meningeal signs).
   - Complex convulsion (i.e. lasting longer than 10 minutes, or with focal features, e.g. jerking affecting only one limb or repeated in the same episode of illness or with incomplete recovery within 1 hour).
   - Early review by a doctor not possible.
   - Inadequate home circumstances.
   - Career anxious or unable to cope.
   - The cause of the fever requires hospital management in its own right.

Management
A full clinical assessment about type of seizure, its etiology, precipitating factors and concomitant illness should be done and accordingly management is planned. Aim of the treatment is to control seizure to improve quality of life and to prevent complications.

a. Management of the fitting febrile child
   - Clothing should be removed and the child covered with a sheet.
   - The child should be on its side or prone with its head to on side since vomiting with aspiration is a hazard.
   - Rectal diazepam is the drug of choice, producing on effective blood
concentration of anticonvulsant within ten minutes. Dose: 0.5 mg/kg state.

- Repeat same dose if convulsion is not controlled within half an hour14.
- It can be repeated after 30 minutes if convulsion is not controlled. Paracetamol 12-15 mg/kg/dose 4-6 hourly.
- Avoid physical methods such as fanning, cold bathing and tepid sponging-their use is controversial as they are felt to cause some discomfort and minimal benefit15,16.

b. Measurement to consider preventing febrile convulsion

- Treating fevers with antipyretics does not prevent febrile convulsion6.
- Oral diazepam is recommended as an effective and safe method of reducing the risk of recurrence of febrile seizure. At the onset of each febrile illness, diazepam 0.3 mg/kg/dose-8 hourly is administered for the duration of illness (usually 2-3 days)1.
- Diazepam (oral and rectal) at relatively high doses may prevent febrile convulsion in subsequent illness if given at the onset of a febrile episode17.
- Rectal diazepam is safe for home use, providing parents are properly educated in its use11,18.
- Adverse effects have been reported with intermittent use of diazepam; these included ataxia (31.1%), lethargy (28.8%) and irritability (24.4%), but lasted no more than 36 hours19. Continuous prophylaxis is controversial. No treatment is available to reduce the rare risk of subsequent epilepsy. There is evidence to suggest that immunizations do not increase the risk of recurrent febrile convulsion6.

Complication
Long term adverse effects are rare.
There is no evidence of subsequent impaired intelligence or poorer academic achievement20. The risk of subsequent epilepsy is rare but increase with each of the following risk factors.

- Neurological abnormalities or development delay before the onset of febrile convulsion.
- Atypical seizure.
- Family history of epilepsy.
- Complex convulsion.

In the absence of these risk factors only 1% of children go on to develop epilepsy (compared with 0.4% if children without a history of febrile convulsion)18,21.

Febrile convulsion after measles, mumps, rabella (MMR) immunization were not at increased risk of later epilepsy (0.23% compared with 0.60%; not statistically significantly different)22.

Prognosis

- Febrile convulsion recurs in subsequent febrile illness in about 30% of children. Only 9% have more than three seizures4.
- Recurrence is most common within a year of the first febrile convulsion (70%)23.

Recurrence is more likely if:

- The first febrile convulsion occurs under the age of 15 months.
- The first convulsion is complex.
- There is a family history of febrile convulsion or epilepsy in a first degree relative.
- The child attends day nursery (due to increased frequency of febrile illnesses).
- The recurrence rate is 10% in the absence of these risk factors; 25% with one risk factor; 50% with two risk factors and approaches 100% with three or more risk factors7,18.
Counselling of the parents
Although febrile convulsions are frightening to watch, they are not harmful to the child, do not cause brain damage and will not cause the child to die.

- The child will be sleepy for up to an hour after the convulsion.
- Febrile convulsions are not the same as epilepsy.
- Epilepsy can develop later, but this is rare- the chance is about 1 in 100 for children who have had two or more febrile convulsions.
- Febrile convulsion may recur - about 1 in 3 children will have another febrile convulsion.
- Immunization is still advised after a febrile convulsion, even if, as rarely happens, the febrile convulsion followed an immunization.

Conclusion
It is concluded that management of febrile convulsion is very important aspect to make an accurate diagnosis of febrile convulsion and to reassure and inform parents about the benign nature of it. It is also essential to inform parents about the immediate home treatment to reduce possible future febrile convulsion.

References
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