Febrile Seizures

Most common convulsive event in childhood.

ILAE DEFINITION

Seizures occurring in childhood after the age of 1 month, usually between 3 months and 6 years of age in association with a febrile illness, not caused by an infection of the central nervous system, without previous neonatal or unprovoked seizure and not meeting the criteria for other acute symptomatic seizures.

*(It is very important to make an accurate diagnosis in a child <6 months, as signs and symptoms of CNS infection may differ to those of the older child).

DEMOGRAPHICS

Prevalence: Approximately 2-5% but there is a wide geographical variation.
Age of onset: After the age of 1 month, usually between 3 months and 6 years. Nearly 90% have first febrile seizure before the age of 3.
Caution: One must be very careful to exclude treatable causes in the infant <6 months (e.g. meningitis).
Sex: Male female ratio – 1:1
Aetiology: Unknown but felt to be related to a combination of immature brain, fever and genetic predisposition. A family history of febrile seizure is reported in about 15-20% of cases.

SYMPTOMS AND SIGNS

Seizure Semiology:
Simple febrile seizure (~60-70%) and complex febrile seizure (~30-40%):

- Simple febrile seizure: Brief (<15 minutes), generalised tonic clonic seizure and a single seizure per illness
- Complex febrile seizure: Focal, prolonged (>15 minutes) or multiple per illness

Focal features are described in about 4-16% of febrile seizures.

Predictors of recurrence:
About 30-40% of children with first febrile seizure will have at least one recurrence, mostly (~75%) within a year of first febrile seizure:

- Younger age (<12mo) of first seizure onset is associated with a recurrence risk close to 50%
- Family history of febrile seizure (first degree relative) is associated with approximately 25% increment in the absolute risk of a recurrent febrile seizure
- Low temperature at the time of the seizure
- Short duration of illness before seizure

Presence of all four risk factors are associated with about 76% chance of seizure recurrence compared to ~4% chance without any risk factors.

Risk for subsequent epilepsy:
The vast majority of children who present with febrile seizure will not develop epilepsy
Risk factors for epilepsy include - complex febrile seizures, neurodevelopmental abnormality and family history of epilepsy
Each of the individual components of complex febrile seizure is a risk factor for developing epilepsy
For children with all three features of a complex febrile seizure, the risk increases to ~49%. This is a very small percentage of all children with febrile convulsions.
Children with no risk factors have a ~2.4% chance of developing afebrile seizures by 25 years compared with ~1.4% for the general population

FEBRILE STATUS EPILEPTICUS (FSE)

Febrile status epilepticus occurs in about 5% of children with febrile seizures and are more likely to be focal.
It occurs in very young children (median age 1.3 yr) and is usually the first febrile seizure
A prolonged febrile seizure is a risk factor for further prolonged attacks
Compared with children with simple febrile seizure, FSE is associated with: younger age, lower temperature, longer duration (1-24 hours) of recognized temperature before febrile seizure, female sex, structural temporal lobe abnormalities, developmental delay and first-degree family history of febrile seizure
A prospective randomised study (FEBSTAT) demonstrated acute hippocampal injury (MRI T2 signal abnormality) in 11.5% of children with febrile status and it was noted to be significant compared to simple febrile seizures (p<0.0001). This cohort is being followed up in the long term. Evolution to hippocampal sclerosis was seen in a subset.

INVESTIGATIONS

Lumbar puncture:
Needs to be considered if safe and when clinically indicated
About 15% of children with meningitis will have a seizure but the majority are not neurologically normal shortly after the seizure
Meningitis is reported in up to 18% of children with febrile status epilepticus

Neuroimaging:
Imaging in simple febrile seizures is, as a rule, not indicated.
In complex febrile seizures, consider acutely whether it is clinically indicated, that is, if an underlying structural lesion or CNS process is suspected in the differential.

EEG:
No consistent evidence for routine EEG to predict subsequent epilepsy or febrile seizure recurrence, including complex febrile seizures and febrile status epilepticus

PROGNOSIS

The overall cognitive outcome is good, but the Febstat study (2017) has shown despite overall average intellectual functioning, children with a history of FSE are at risk for memory impairment when they present with acute hippocampal injury, abnormal hippocampal development, or focal seizures.

MANAGEMENT OPTIONS

Parental counselling. This is critical.
Acute management of seizure
Prophylactic treatment is generally not indicated
Some efficacy is reported with Phenobarbitone and Valproic acid as prophylaxis but rarely indicated and not generally suggested by authorities
There is convincing evidence that antipyretics are not effective in preventing febrile seizure recurrence
DIFFERENTIAL DIAGNOSIS

- Dravet syndrome
- GEFS+ syndrome
- Other generalized epilepsies

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REFERENCES:


