

Febrile cramps

Febrile convulsions (FC) are febrile seizures that occur in children between 6 months and 5 years of age, exceptionally less than 6 months of age and 6 and 7 years of age, which are not caused by neuroinfections or metabolic disruption and patients have no history of afebrile seizures.^[1] Febrile cramps occur in 2-5% of children during their lifetime. They are the most common cause of seizures in children under 5 years of age. In uncomplicated febrile convulsions, only antipyretics are indicated, not antiepileptics. Benzodiazepines are indicated for seizures lasting more than 5 minutes. Uncomplicated febrile convulsions are benign and generally have a very good prognosis.^[2]

Uncomplicated febrile convulsions (simple, simplex)

- short (mostly within 5 minutes)^[1], up to 15 minutes^[2],
- generalized clonic seizures (possibly tonic-clonic or just atony and impaired consciousness),
- mostly with a rapid return to full consciousness.

Complicated febrile convulsions (complex)

- focal (lateralized) seizures and / or
- seizures lasting more than 15 minutes and / or
- recurrent seizures within 24 hours.^[1]

Febrile status epilepticus

- a seizure lasting more than 30 minutes.

PFAPA (periodic fever, aphthous stomatitis, pharyngitis, adenitis)

- may be the cause of convulsions

Etiopathogenesis

The mechanism of febrile convulsions (FC) is still unclear. FK usually occurs **at the beginning of febrile illness in the phase of temperature rise.**

The main etiological factors are fever, age and genetic predisposition - a positive family history is in up to 30% of cases.^[2]

Classification

FK can be divided into **simple** (simple febrile seizures), **complicated** (complex febrile seizures) and **symptomatic** (symptomatic febrile seizures). We speak of symptomatic seizures if they arise from an acute CNS disease (meningitis, encephalitis, sepsis) or from an underlying neurological disease or CNS malformation.^[3]

diagnostic criteria	simple febrile cramps	complicated febrile convulsions
age	6 months - 6 years	< 6 months or > 6 year
seizure length	< 10 minutes, (in USA < 15 minutes)	> 10 minutes, (in USA > 15 minutes)
type of cramps	generalized tonic-clonic convulsions, hypotonic state with unconsciousness = febrile collapse (syncope)	topical convulsions - hemicovulsion
condition after the attack	without symptoms	meningeal syndrome, symptoms of brain edema, changes in muscle tone, disorders of basic vital functions
family and personal history	insignificant	in RA epilepsy, in OA perinatal risks, CNS injuries, CNS infections, delayed psychomotor development, recent vaccination

Clinical picture

Generalized manifestations are **generalized tonic-clonic seizures**, in some cases typical seizures do not occur and clinical manifestations have the **character of febrile syncope with impaired vegetative functions.** Children in the category of simple FC are healthy in terms of neurology and psychomotor development. They never had seizures in an afebrile condition.

FK comes most often during the initial rise in temperature. They are often the first manifestation of the disease at all, when convulsions indicate that the child has an infectious disease. The temperature limit at which the seizures would start is unknown. However, based on experience, we can say that if the child has $<38.0^{\circ}\text{C}$ per rectum, the probability of simple FK is low. However, it should be taken into account that the measured body temperature may be affected by previous antipyretic treatment.^[3]

Differential diagnostics

- neuroinfections (acute viral or bacterial meningitis or meningoencephalitis);
- herpetic encephalitis - recurrent convulsions, focal symptoms (focal / lateralized seizures, hemiparesis, cranial nerve disorders, visual impairment, aphasia) and persistent impairment of consciousness; in cerebrospinal fluid pleocytosis (not always), focal abnormality on EEG; signal changes on MRI; treatment: acyclovir i.v.;^[1]
- Dravet's syndrome - repeated prolonged and / or lateralized convulsions at temperature; genetically resistant drug-resistant epilepsy);^[1]
- convulsions that occur during a febrile infection are not the primary cause of their seizures;
- febrile syncope (differential diagnosis is also complicated by the possible occurrence of syncope convulsions);
- GEFS + (generalized epilepsy with febrile seizure plus).

In the lowest age category, in addition to neuroinfection, a metabolic defect and a structural defect of the CNS must be ruled out.^[2]

Diagnostic algorithm

- Clinical examination by a pediatrician - to rule out neuroinfection, to determine the cause of fever.
- Laboratory examination - according to the clinical condition of the child.
- Lumbar puncture - in clinical or anamnestic signs of neuroinfection and in children in whom antibiotic treatment has already been started (due to the possibility of a mitigated course of neuroinfection).

Complicated FK:

- Neurological examination
- Electroencephalography (EEG)
- Eye background - at the discretion of the attending physician.
- CNS imaging - as indicated by a pediatric neurologist.^[1]

Therapy

Acute treatment: Administration of benzodiazepines as acute treatment of FK follows the same rules as treatment of epileptic seizures, ie they are indicated in the treatment of seizures usually longer than 2-3 minutes:

- diazepam rectally: 5 mg (in children up to 15 kg body weight); 10 mg (in children over 15 kg)
- diazepam i.v. : 0.5 mg / kg / dose (in children under 3 years of age), 0.3 mg / kg / dose (in older children)
- midazolam i.v. : 0.2 mg / kg / dose (in children under 3 years); 0.1 mg / kg / dose (in older children)
- midazolam i.m. : 0.25 mg / kg / dose.^[1]

Prophylactic administration of benzodiazepines at home at a temperature is NOT recommended (possibility of masking the symptoms of neuroinfection, common side effects, potential for overdose).^[1]

In addition to general regimen measures, antipyretics are indicated for uncomplicated febrile convulsions:

- paracetamol 10-15 mg / kg for dosi, max. 60 mg / kg for die p.o., p.r.
- ibuprofen 5-10 mg / kg for dosi p.o., p.r.

Antiepileptic therapy is not recommended in patients with simple febrile convulsions.^[2]

Prognosis

The risk of developing epilepsy after uncomplicated FK is comparable to the prevalence of epilepsy in the general population (approximately 1-2%). After complicated FK, this risk is higher (5-10%). The overall risk for both types of FK is 2-4%. The prognosis of the vast majority of FK is therefore excellent.^[1]

Uncomplicated febrile convulsions are benign and generally have a very good prognosis. The risk of recurrence after febrile convulsions is 30% and after two or more episodes up to 50%. There was no increased mortality or increased incidence of focal neurological symptoms or mental retardation in children with simple febrile convulsions. The risk of developing epilepsy is only slightly higher than in the healthy population after simple febrile convulsions.^[2]

Sources

Related articles

- Consciousness and its disorders
- Fever(pediatrics)

External links

- Febrilní křeče (doporučený postup Společnosti dětské neurologie ČLS JEP, 2017) (http://www.detskaneurologie.cz/dokumenty/DP_febrilni_krece.pdf)
- Pediatrie pro praxi – Goldemund, K.: Febrilní křeče (<http://www.pediatricpropraxi.cz/pdfs/ped/2001/04/05.pdf>)

References

- 1.
- 2.
3. HAVRÁNEK, Jiří: *Febrilní křeče*