

Management of Complex Febrile Seizures

An 13 month old girl presents to the ED after having a shaking episode at home. Mom describes shaking of both arms and legs, lasting 20 minutes. The child has no personal history of seizures or neurological abnormalities. There is no family history of seizures. She is fully vaccinated. On exam vitals are BP: 100/72, HR 112, RR 22, T: 39.7C. She is well appearing, however unable to move her right hand. The rest of your exam is within normal limits. What is the most appropriate next step in management?

- A. Lumbar puncture
- B. Head CT
- C. Neuro Consult
- D. EEG
- E. Tylenol
- F. Blood culture
- G. Wrist X-ray

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- There are no well defined guidelines for the management of complex febrile seizures. Management is often individualized.

1. Control Seizure

- ABC's, benzodiazepines
- If seizure stopped spontaneously before arrival to hospital no anticonvulsant medication is required

2. Control Fever

- Acetaminophen, ibuprofen

3. Rule out CNS infection

The overall prevalence of meningitis presenting with fever and seizures is between 0-4%. If history and physical are normal, it is very unlikely that the child has meningitis, even in complex febrile seizures. A retrospective cohort study identified 526 children ages 6 months-60 months who were evaluated in Pediatric Emergency Departments after their first complex febrile seizure. 340 of them had LP's. 3 of those patients had bacterial meningitis. Two had s.pneumo in CSF culture. Among these 2 patients, 1 was nonresponsive during presentation and the other had a bulging fontanelle. The third child appeared well, however grew s.pneumo in blood culture and LP was contaminated with blood and CSF culture showed no growth. None of the patients for whom an LP was not performed did not return to the hospital with a diagnosis of bacterial meningitis. [1]

Indications for LP in Complex Febrile Seizure

LP Indicated	LP Considered	Clinical Judgement
Signs or symptoms of meningitis	Infants between 6-12 months if the immunization status for Hib and S.pneumo is deficient or undetermined	If child was previously neurologically abnormal
	If patient is on antibiotic therapy, bc Abx can mask signs and symptoms of meningitis	

4. Find and treat cause of fever

Common infections in which febrile seizures may occur: URI/LRI, otitis media, UTI, AGE, shigellosis, Post vaccine: DPT, polio, measles, MMR

5. Subsequent investigation

EEG : 35-45% of patients with FS will have paroxysmal EEG abnormalities.

Children with CFS are more likely to have abnormalities, and many practitioners order EEGs for children with CFS. However, an EEG is not required for the diagnosis or management of FS. It is also not clear whether an abnormal EEG will predict future recurrences or epilepsy.

CT: Emergent CT scans are not indicated for CFS, in absence of other focal neurological signs, because very few patients are actually found to have intracranial pathology

MRI: As outpatient, if pre-existing or post ictal neurological abnormality. For complex febrile seizures, if there is doubt whether it was actually a febrile seizure. There is an increased risk of mesial temporal sclerosis, but it is unclear whether this is an effect or a cause of FS

6. Counseling

Patients may have recurrent febrile seizures. There is a slight increased of risk for epilepsy in children with complex febrile seizures. There is no increase in neurological deficits or mortality following febrile seizures

Hospitalization may be required after the first febrile seizure, especially if there are any indications for a lumbar puncture, or if the family is unable to cope with the seizure at home should it recur. Hospitalization is not required for subsequent febrile seizures

A 4 year old girl arrives to the ED actively seizing. Parents report that she has been seizing for the past 20 minutes. Mom reports that she has been having runny nose, cough, and complaining of ear pain for the past day. She has never had a seizure before. She has no significant past medical history. There is no family history of epilepsy. Her older brother had a febrile seizure when he was 2 years old. Vitals are HR 100, BP 96/85, RR 20, T 40C, O2 Sat 99%. What is the next best step in management?

- A. Intubation
- B. Rectal Diazepam 0.3-0.5mg/kg IV solution
- C. Valproic Acid 3-5mg/kg/day
- D. Rectal midazolam 1mg/kg
- E. Normal Saline Bolus 10ml/kg

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Febrile Seizure Termination: Rectal Diazepam terminates 80-90% of SFS, CFS, status epilepticus, and epilepsy. [2] Intranasal And buccal diazepam are also effective at terminating seizures within 5-10 minutes. Rectal Diazepam can also be used at home to terminate seizures.

1. Diazepam
 - IV 0.2-0.4mg/kg
 - Rectal 0.3-0.5mg/kg/dose (oral or parenteral prep)
2. Midazolam
 - Buccal 0.2mg/kg of IV soln
 - Intranasal 0.2mg/kg of IV soln
 - IV/IM 0.1mg/kg

Intermittent Prophylaxis: Rectal diazepam can also be used at home to terminate seizures. Many practitioners also advise antipyretics at home to reduce the risk of febrile seizures, however this has been refuted in RCTs.

1. Diazepam
 - Rectal 0.3-0.5mg/kg/dose (oral or parenteral prep)
 - Oral 0.3-0.5mg/kg TID for 48 hours
2. Clobazam
 - 1mg/kg/d

Long term prophylaxis with phenobarbitone and valproate has not been shown to be useful in preventing recurrences of febrile seizures.

References

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5. Mastrangelo et. al. Actual insights into the clinical management of febrile seizures. *Eur J Pediatr*. 2014. 173: 977-982.
6. Boyle et. al. Clinical factors associated with invasive testing and imaging in patients with complex febrile seizures. *Ped Emerg Care*. 2013. Vol 29. No 4.