



COPP MODULE

**COMMON OFFICE PRACTICE PEDIATRIC PROBLEMS
[A MODULE OF IAP TAMILNADU STATE CHAPTER 2017]**

TEAM

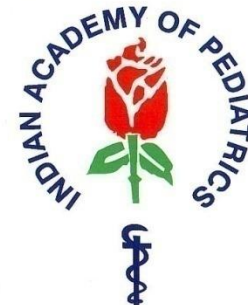
- Scientific advisors Dr P Ramachandran, Dr S Balasubramanian
- Conveners Dr S Thirumalai Kolundu, Dr Sunil Srinivasan
- Scientific Coordinator Dr A Somasundaram
- Academic coordinators Dr S Narmada, Dr R.V Dhakshayani
- Academic committee [MODERATORS]
 - Dr NC Gowrishankar,
 - Dr T N Manohar,
 - Dr K Nedunchelian,
 - Dr Rema Chandramohan,
 - Dr R Somasekar,
 - Dr S Thangavelu,
 - Dr V V Varadarajan

- 1.Dr.R.V.Dhakshayani
- 2.Dr.Hemchand K Prasad
- 3. Dr.E.Mahender
- 4.Dr.S.Mangalabharathi
- 5.Dr.C.Manigandan
- 6.Dr.S.Manikumar
- 7.Dr.S.Giridar
- 8.Dr.S.Narmada
- 9.Dr.R.Selvan
- 10.Dr.A.Somasundaram
- 11.Dr.P.Sudhakar
- 12.Dr.Sudharsana Skanda
- 13.Dr.N.Suresh
- 14.Dr.So.Sivabalan
- 15.Dr.S.Srinivas
- 16.Dr.Venkateswaran
- 17.Dr.C.Vijayabhaskar
- 18.Dr Palaniraman
- 19.Dr B.Sumathi

Dr. R.V.Dhakshayani, M.D. (Ped)



- Senior Assistant Professor of Pediatrics, Institute of Child Health, Madras Medical College
- Recipient of Dr. V. Balagopal Raju 'Active Pediatrician Award' by IAP in 2015
- Editor, IAP CCB, 2014-2017
- Editor, IAP TNSC, 2017-2018
- Associate Editor, Practical Pediatric Digest
- Areas of interest - Pediatric Diabetes, Epidemiology



**Febrile seizures -
Do I need to investigate?
Role of anticonvulsants?**

Dr.R.V.Dhakshayani

Febrile seizures - Definitions



Febrile seizures

- Seizures occurring in febrile children between 6 months & 60 months of age ,with no evidence of intracranial infection, metabolic disturbance or prior afebrile seizures

Simple febrile seizures (70 -75%)

- Febrile seizures presenting as primary generalized seizures lasting for < 15 minutes and no recurrence within 24 hours.

Complex febrile seizures (20 -25%)

- Presents as focal or localized seizures, prolonged (>15 mins. but <30mins.) and/or recurrent within 24 hours

Febrile status epilepticus

- Prolonged seizures lasting longer than 30 mins.
- *Recommendations for the management of "febrile seizures" Ad hoc Task Force of LICE Guidelines Commission,ILAE,2009*

Risk factors for recurrence



Major

- Age at first febrile seizure <1 yr
- Duration between fever and seizure <24hrs
- Lower temperature at onset of fits [38° - 39° C (100.4° - $102. 2^{\circ}$ F)]
- Family h/o febrile seizures in first degree relatives

Minor

- Family H/o epilepsy
- Complex febrile seizures
- Day care
- Male gender
- Low sodium at time of presentation
- Seizure as the first sign of fever
- First seizure lasted more than 10 minutes

Probability of recurrence

A child with

- Nil risk factor <15% risk
- 1 risk factor -20% risk
- 2 or more risk factors > 30% risk
- 3 or more risk factors > 60% recurrence risk at 2 years

Future epilepsy- Risk factors

- Developmental anomalies (33%)
- Complex febrile seizures (29%)
- Family history of epilepsy (18%)
- Fever < 1hr before febrile seizure (11%)
- Recurrent febrile seizures (4%)
- Simple febrile seizures (1%)



LABORATORY INVESTIGATIONS & DIAGNOSTIC STANDARDS

Lumbar puncture - Indications



Simple febrile seizures

- Child < 6 months - Standard of care
- Between 6 and 12 months of age - Not received recommended doses of Hib or pneumococcal vaccines (or) if immunization status cannot be ascertained
- History or physical examination suggestive of meningitis or intracranial infection (e.g. Focal signs , sinuses, cyst, etc. in the lumbo sacral region)
- Consider if the patient had pre treatment with antibiotic

Complex febrile seizures

- No clear evidence for or against lumbar puncture .
- Indicated in unimmunized and individualized in the others

AAP clinical practice guidelines, Feb 2011

EEG in febrile seizures- Consensus



- Routine EEG - limited or no value in simple / 1st episode of complex febrile seizure.
- EEG abnormalities, even if present, do not help in diagnosis or management
- Shows focal slowing within 7 days (early EEG) of the seizure or even up to 2 weeks. EEG should be done after 2 weeks to identify inter ictal abnormalities (late EEG)
- Urgent EEG is only indicated if there is concern for subclinical seizures or non-convulsive status.
- Persistent EEG abnormalities (repeat EEG) are more predictive of the risk of developing epilepsy than a specific EEG finding

Archives of Disease in Childhood, 2004

Nelson's Textbook of Pediatrics, 1st South Asian Edition



EEG in complex febrile seizures

EEG should be considered in all children with

- Recurrent complex febrile seizures and/or afebrile convulsions
- Recurrent febrile seizures with developmental delay
- Abnormal neurological signs and symptoms
- Children with very prolonged febrile seizures

Archives of Disease in Childhood, 2004

Neuroimaging

- **Not indicated in simple febrile seizure / Not routinely recommended in complex febrile seizures**

Indications for imaging

- **MRI brain**
Recurrent complex febrile seizures with post ictal neurological deficit persisting for more than a few hours
MRI - more sensitive than CT for brain disorders presenting with seizures.
- **CT scans** may have diagnostic use if there is a strong indication of an acute/sub acute bleed or structural lesion based on patient's examination and history.

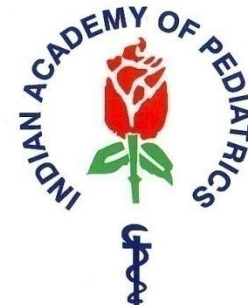
Blood culture & metabolic parameters



Laboratory evaluation

- Not routinely indicated
- Indicated if source of fever is uncertain or diagnosis is unclear
- Consider CBC, blood culture, serum glucose, electrolytes, magnesium, calcium, phosphorous, urinalysis and urine culture etc., as clinical condition warrants .

AAP clinical practice guidelines, Feb 2011



THERAPEUTIC INTERVENTIONS IN MANAGEMENT OF FEBRILE SEIZURES

During the seizure episode

- During an episode of seizure - Airway management , positioning to prevent aspiration of secretions and vomiting (lateral recumbent with head extension) , prevent injury and secure IV access
- In case of febrile seizures lasting for >5 minutes - **diazepam (0.3-0.5 mg/kg), lorazepam(0.1 mg/kg) or midazolam (0.2 mg/kg)**
- If IV access not feasible, **rectal diazepam (0.5mg/kg)** as suppository
- Alternatively **buccal or intranasal midazolam** can be used
- With febrile status epilepticus - to follow the regular '**status epilepticus protocol**'

Fukuyama et al., 1996; AAP, 1999: (class of evidence I).

Criteria for Hospital Admission

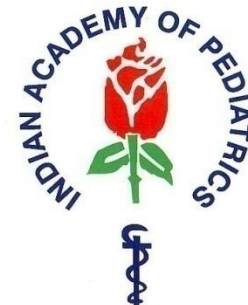
- **Simple febrile seizures - First episode**

Age 6m -18 months-clinical condition suggests an acute CNS infection, possibly for a lumbar puncture and CSF analysis

Age >18m- If the patient is clinically stable, with no signs or symptoms requiring diagnostic investigations, admission is unnecessary and parents should be adequately educated

- Previously diagnosed SFS, presently with features of an acute CNS infection
- Complex febrile seizures
- Febrile seizures in children without a reliable familiar context???

- *Joint Working Group of the Research unit of Royal College of Physicians and the BPA,2009; Recommendations for the management of “febrile seizures” Ad hoc Task Force of LICE Guidelines Commission,ILAE 2009 , AAP,1996;*



Prophylactic AEDs in febrile seizures - Practical considerations

- Effectiveness of **intermittent anticonvulsant therapy** in preventing recurrent febrile seizures - Role?
- Effectiveness of **continuous anticonvulsant therapy** in preventing recurrent febrile seizures - Role?
- Effectiveness of **antipyretics** in preventing recurrent febrile seizures during that febrile episode – Role?
- **Adverse effects** of either continuous or intermittent anticonvulsant therapy.

Role of AED in febrile seizures

Simple febrile seizures - Reassuring facts

- Risk of febrile seizure in the general population is 2% - 5% & overall recurrence - 30%
- **Simple febrile seizures** are benign; long-term prognosis is excellent
- No evidence that treating simple febrile seizures with AEDs decreases incidence of epilepsy later or results in improved cognitive outcomes

Cochrane Database Syst Rev. 2017



Prophylactic AED in febrile seizures – Consensus statement

Committee on Quality Improvement, Subcommittee on Febrile Seizures of the AAP concludes that

"Based on the risk and benefits of effective therapies, neither continuous nor intermittent AED is recommended for children with one or more simple febrile seizures.

While AEDs may decrease the risk of recurrent febrile seizures, these benign events are not worth their prevention, considering the potential adverse effects of treatment"

- *Committee on Quality Improvement, Subcommittee on Febrile Seizures of the AAP*

Intermittent AED prophylaxis

Indications

Intermittent prophylaxis with Clobazam/ Diazepam in children with febrile seizures need to be individualized based on underlying risk factors.

- When seizures are considered as “unacceptable” because of their high frequency (≥ 3 in 6 m, ≥ 4 in one year)
- Previous episode of complex febrile seizures
- Poor access to immediate health care
- Febrile seizures with risk factors

Intermittent AEDs starting at the onset of fever- Drugs, dosage and duration



- **Oral Clobazam** (0.3mg/kg /dose q12 hrly)
- **Oral Diazepam** (0.33mg/kg/dose q8 hrly)
- **Rectal Diazepam** (0.4mg/kg/dose) to be given at the onset of fever; repeated a second time if fever persists > 8 hrs; (Clobazam after 12 hrs); third dose may be given for upto 24 hrs.
- **Intermittent Clobazam therapy - advantageous to diazepam;** similar efficacy but significantly lower adverse effects
- Earlier guidelines recommended intermittent AED for 48 hours and has been conventionally followed.

In 98% of cases, febrile seizures occur within the first 24 hrs from the onset of fever; hence not justified to extend therapy after this period.

Intermittent AED prophylaxis not recommended in

Patients with one or more SFS episodes and reliable parents

Management in such children

- Active surveillance & monitor the natural evolution of seizures
 - Follow the principle of “wait and see”
 - **Administration of anticonvulsant therapy be avoided**
 - Give parents exhaustive information, including instructions on rectal diazepam administration in the event of a prolonged seizure episode
- Fukuyama et al., 1996; AAP, 1999: (class of evidence I).*
- Alternative : Intranasal /buccal midazolam

Continuous AED prophylaxis

Indications

- Failure of intermittent therapy
- Parents are unable to promptly recognize the onset of fever
- Recurrent complex febrile seizures
- Family H/O epilepsy
- Presence of prolonged altered level of consciousness
- Postictal paresis/focal neurological findings

Continuous AEDs- Drugs, dosage and duration

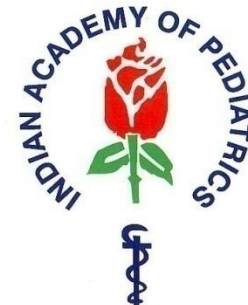


Sodium valproate > phenobarbitone

- Phenobarbital - 3-5 mg/kg/day in 1–2 intakes
Valproic acid - 20-30 mg/kg/day, in 2–3 intakes
Adverse effects - 20 -40%; resulting in discontinuation
- Phenobarbital -ADHD, cognitive impairment
- Valproic acid -Liver dysfunction
- **Continued for at least 2yrs or until 6yrs, whichever is earlier**
- Carbamazepine and Phenytoin- not effective in preventing recurrence of simple febrile seizures.

American Academy of Pediatrics Practice guidelines,2011

Fukuyama et al., 1996; AAP, 1999: (class of evidence I).



Does treatment with AEDs prevent future epilepsy?

- Our current treatments for febrile seizures do not accomplish this goal
- AEDs reduce the chances of further febrile seizures but do not alter the risk of future epilepsy ; febrile seizures in infancy are only the marker for that predisposition and not the cause for epilepsy
- In a majority of cases, counselling and education will be the only line of management



Intermittent antipyretics

Benefits & risks

- No evidence that antipyretic medications, in the absence of anticonvulsants, or other methods for reducing fever will reduce the recurrence risk of simple febrile seizures
- Administering prophylactic Paracetamol during febrile episodes - ineffective in preventing febrile seizure recurrence.
- It may be used for pain / discomfort associated with febrile illnesses such as otitis media.
- *Cochrane Database Syst Rev. 2017 ; Febrile seizures, UpToDate,2013; AAP, 1999; (class of evidence I)*

Health Education to Families- Essential Issues



- **Reassurance**
- Describe in detail the features of febrile seizures, relation with age, recurrence rate, risk of subsequent epilepsy, prognosis and benign evolution. This will allow parents to easily accept not to treat.
- Instruct on the need of appropriateness of AED, when prescribed, including the relevant side effects.
- Verify that the instructions for fever control are well understood.
- Education on how to manage possible recurrences.
- In any event, to contact the family pediatrician or other practitioner.

Long term prognosis - Reassuring facts

- No evidence of increased mortality, hemiplegia, or mental retardation
- Recurrence in one-third .
- Risk of epilepsy after a simple febrile seizure - only slightly higher than that of the general population
- Cognitive and intellectual outcomes are favourable

Remember



Febrile seizure associated syndromes (neurological follow up is needed in children with recurrent febrile seizures in early infancy)

- **Febrile infection related epilepsy syndrome (FIRES) –**
 - A catastrophic encephalopathy with focal/multifocal seizures and refractory status epilepticus
 - Developmentally normal children in the age gp. of 3-15 years.
 - Can be associated with behavioural changes, memory disturbances and EEG changes.
 - AEDs are usually ineffective



- **Dravet's syndrome –**
 - Febrile & afebrile unilateral clonic seizures every 1-2 months.
 - Seizures prolonged, focal, occur in clusters; Later with lower temperature / even without fever.
 - Beyond infancy - myoclonus, atypical absences & partial seizures with developmental delay.
- **Generalised epilepsy with febrile seizure plus syndrome (GEFS+) –**
 - Autosomal dominant disorder with onset in early childhood & remits by mid childhood.
 - Febrile seizures initially ,later afebrile seizures also
 - Multiple febrile seizures & afebrile seizures

Key points



- **Febrile seizures (simple and complex) are almost always benign and generally are not associated with neurological consequences**
- There are limited indications for investigations including blood investigations, neuroimaging or EEG
- The mainstay of investigation and treatment is targeted towards acute CNS infection, underlying metabolic errors, structural brain anomalies etc.

Key points

- Intermittent clobazam therapy is an effective measure in the prevention of recurrence of febrile seizures in CFS, **when indicated**
- There is **no indication for initiation of continuous antiepileptic drugs for simple febrile seizures**
- Counselling and reassurance of caregivers is key in the management, especially for simple febrile seizures



THANK YOU