Febrile convulsions - Emergency management in children

Purpose

This document provides clinical guidance for all staff involved in the care and management of a child presenting to an Emergency Department (ED) with a suspected febrile convulsion in Queensland.

This guideline has been developed by senior ED clinicians and Paediatricians across Queensland, with input from Paediatric Neurology, Lady Cilento Children's Hospital, Brisbane. It has been endorsed for use across Queensland by the Statewide Emergency Care of Children Working Group in partnership with the Queensland Emergency Department Strategic Advisory Panel and the Healthcare Improvement Unit, Clinical Excellence Division.

Key points

- Most febrile convulsions are brief, isolated generalised tonic-clonic seizures that occur with an acute febrile illness in children aged 6 months to 6 years (known as simple febrile convulsions).
- The diagnosis of a simple febrile convulsion is based on careful history and examination.
- The simple febrile convulsion recurrence rate is 30 – 35% with 10% of children experiencing ≥ 3 convulsions.
- Simple febrile convulsions do not cause neurological damage and are not typically associated with a future diagnosis of epilepsy.
- Management is directed at identifying and appropriately treating the source of the infection.

Introduction

Febrile convulsions are a frequent ED presentation and the most common seizure disorder in children.[1] Approximately 1 in 30 children will experience a febrile convulsion as a result of a fever, mostly between the ages of 6 months and 6 years.

Most febrile convulsions are brief, isolated generalised tonic-clonic seizures that occur with an acute febrile illness in children with no history of afebrile seizures, significant known neurological abnormality or current CNS infection.[1,2]

There is no evidence to suggest any structural neurological damage or increased risk of cognitive decline in a child who experiences a simple febrile convulsion.[3]

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Recurrent febrile convulsions

The estimated overall febrile convulsion recurrence rate is 30-35%[4] with 10% of children experiencing ≥ 3 convulsions.[5]

Risk factors for recurrent febrile convulsions include:

- first febrile convulsion < 18 months of age
- family history of febrile convulsions or epilepsy

Febrile convulsions and epilepsy

Most children who experience a febrile convulsion will not develop epilepsy later in life.[1] Children who have multiple febrile convulsions starting < 1 year of age are at the highest risk of developing afebrile seizures by 25 years of age.[6] However, even in this group the risk is only 2.4% compared to the background 1% risk for the general population.[6-8]

Classification

Classification of febrile convulsions		
Simple febrile convulsion	**Complex febrile convulsion**	**Febrile status epilepticus**
Fever and **ALL** of the following: • generalised onset • can be up to 15 minutes though most are less than this • does not occur more than once in a 24-hour period. • no history of afebrile seizures, known neurological abnormality or current CNS infection	Fever and **ANY** of the following: • duration > 15 minutes • focal symptoms • reoccurs within a 24-hour period.	Fever and **ANY** of the following: • duration > 30 minutes • recurrent brief seizures without complete recovery of consciousness

Assessment

The aim of the assessment is to:

- differentiate simple febrile convulsion from other convulsions which require specialist referral
- identify and, if necessary, treat the source of the fever (refer to Febrile illness Guideline)

> A febrile child with a self-limiting generalised convulsion lasting < 15 minutes who is outside the usual age range of 6 months to 6 years should have a wider differential diagnosis carefully considered and excluded prior to a final simple febrile convulsion diagnosis.

Febrile convulsions are extremely distressing to the care giver and other witnesses so be aware of the likely parental anxiety at the time of presentation.

History

Differentiating simple febrile convulsions from other convulsions will require specific questioning on:

- details preceding the convulsive episode including:
    - prior events and behaviour of the child
    - signs or symptoms of illness
- details of the convulsion including:
    - how it started
    - the exact movements of the eyes and limbs
    - symmetry of the movements
    - focal movements
    - estimated duration
- appearance/behaviour of the child post convulsion
- any previous convulsions (including afebrile)
- medical and surgical history including intracranial infection or severe metabolic disturbance such as hypoglycaemia or electrolyte disturbance, neurological damage, neurosurgical procedures (including the placement of ventriculo-peritoneal shunts)

Examination

The examination should be directed by the history, with particular emphasis on:

- localising a source for the fever
- assessing neurological status and return to normal level of alertness and activity

Investigations

Simple febrile convulsions

Investigations are not routinely required for simple febrile convulsions providing the child is aged between 6 months and 6 years and makes a full recovery to normal self after a period of observation.[2] Investigations in this group of children should be directed by the suspected underlying cause of infection (see Febrile illness Guideline) rather than the febrile convulsion itself dictating investigation.

The following investigations are **NOT** routinely recommended if the child is otherwise well:

- bloods
- lumbar puncture (LP)
- imaging
- electroencephalogram (EEG) (not predictive of future febrile convulsion or epilepsy risk)[9, 10]

If the source of infection is not identified on initial assessment consider the role of sterile urine collection to exclude urinary tract infection. Refer to Febrile illness Guideline for further information on the recommended approach to investigations for febrile children with no identified focus of infection.

Refer to the Meningitis Guideline for the indications for LP in a child with suspected meningitis. Research has shown fully immunised children aged 6 to 18 months who present after a febrile convulsion, and are clinically well with no prior antibiotic treatment are at a very low risk of bacterial meningitis.[11,12]

Atypical simple and other febrile convulsions

Any febrile convulsion that has a focal component, is prolonged (> 15 minutes), or results in a slow return to normal conscious state should prompt investigation into underlying infection. A focal component to the seizure, or any focal neurological findings, should prompt consideration of CNS infection or structural abnormality.

Investigations in the management of febrile convulsions	
Investigation Type	**Utility**
Full blood count (FBC)	Consider in prolonged or focal convulsion to aid in assessment of febrile illness.
Serum biochemistry	Consider in prolonged or focal convulsion to exclude electrolyte abnormality.
Urine MCS	Consider if no focus of fever evident on initial assessment to screen for a UTI.
Lumbar puncture (LP)	Consider if suspected infective meningitis or encephalitis Consider in child with prolonged or focal convulsion or focal neurological findings for investigation of possible CNS infection or structural abnormalities.
EEG	On specialist advice in atypical febrile convulsion (as an outpatient) or in febrile status epilepticus (as an inpatient).
Neuroimaging	Persistent focal neurology or if otherwise clinically indicated (as an emergency). On specialist advice for recurrent and complex febrile convulsions (especially if developmental delay and abnormal head circumference[13]) (as an outpatient).

Management

ALERT – Febrile status epilepticus is a medical emergency which requires simultaneous rapid assessment and treatment.

Seek urgent senior emergency/paediatric assistance for a child with febrile status epilepticus. Consider contacting paediatric critical care (onsite or via RSQ).

Seek senior emergency/paediatric advice for all children with a complex febrile convulsion.

Acute treatment is indicated for prolonged convulsions > 5 minutes (refer to Guidelines for the Emergency Management of Seizures (QH only). Earlier onset of treatment results in shorter duration of complex febrile convulsions.[13]

Management will be dictated by the source of the fever. Refer to the Febrile illness Guideline for guidance on the management of febrile children with no focus of infection evident on initial assessment.

Ibuprofen and or paracetamol may alleviate discomfort in a febrile child. Neither antipyretics or anticonvulsants prevent the recurrence of simple febrile convulsions.[14,15]

When to escalate care

Follow your local facility escalation protocols for children of concern. Transfer is recommended if the child requires care beyond the level of comfort of the treating hospital. Clinicians can contact the services outlined below to escalate the care of a paediatric patient.

Service	Reason for contact by clinician	Contact
Local Paediatric service	For specialist paediatric advice and assistance with local transfers as per local arrangements.	As per local arrangements
Children's Advice and Transport Coordination Hub (CATCH)	For access to specialist paediatric advice and assistance with inter-hospital transfer of non-critical patients into and out of Lady Cilento Children's Hospital. For assistance with decision making regarding safe and appropriate inter-hospital transfer of children in Queensland. For QH staff, click here for the QH Inter-hospital transfer request form.	(07) 3068 4510 24 hours CATCH website
Telehealth Emergency Management Support Unit (TEMSU)	For access to generalist and specialist acute support and advice via videoconferencing, as per locally agreed pathways, in regional, rural and remote areas in Queensland.	TEMSU QHEPS website 24 hours
Retrieval Services Queensland (RSQ)	For access to telehealth support for, and to notify of, critically unwell patients requiring transfer in Queensland. For any patients requiring aeromedical transfer in Queensland.	RSQ QHEPS website 24 hours

When to consider discharge

Discharge will be based on the source of the infection and the management required. There is no evidence for a prescribed minimum duration of observation following a febrile convulsion.

Consider discharge for a child who meets the following criteria:

- suffered a simple febrile convulsion
- returned to their normal age appropriate baseline neurology
- has an infectious source identified that is appropriate for outpatient treatment
- can be safely managed at home

Prior to discharge, parent/s should receive education regarding:

- the recurrence rate of febrile convulsions
- first aid for a convulsion (with recommendation to complete a formal first aid course)

On discharge, parent/s should be provided with a Febrile convulsions Factsheet

Follow-up

- with General Practitioner within a week to ensure resolution of the instigating febrile illness.

When to consider admission

The requirement for admission will be based on the management of the underlying infectious disease.

The decision to admit a child with complex febrile convulsions or status epilepticus will be made by the specialist referral team based on the further investigations and management required.

Facilities with a Short Stay Unit (SSU)

Consider admission to an SSU for a child following a febrile convulsion for prolonged observation if ongoing parental anxiety or inappropriate community setting (i.e. middle of the night, transport not available).

Related documents

Statewide Emergency Guidelines

- Febrile illness
- Meningitis
- Sepsis

Factsheets

- Febrile convulsions
- Fever in children

References

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Guideline approval

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The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making in partnership with healthcare practitioners including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

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