

## Introduction

Croup is a common and generally self-limiting childhood respiratory illness.

## Epidemiology

Incidence is about 3% <6yrs. This peaks in the second year of life, with croup being uncommon over the age of 6. Male to female ratio is about 2:1. Most prevalent in autumn and spring. Mortality is low, of the order of 1:10000.

## Aetiology

Although some may be allergic or spasmodic (older), most cases are viral in origin. The resultant oedema, exudate and inflammation of the subglottic region between the larynx and trachea causes partial airway obstruction. Most common pathogen is parainfluenza virus types 1, 2 & 3 (others include: RSV, measles, influenza A, adenovirus, and rhinovirus).

## Clinical features

Prodrome of URTI symptoms, stridor, barking/seal-like cough, hoarse voice, low grade fever. Symptoms worsen at night. On examination there may be signs of respiratory distress. Illness may last 4-7 days.

## Differential diagnosis

Foreign body aspiration, bacterial tracheitis, epiglottitis, diphtheria, allergic reaction, retropharyngeal abscess, trauma, and congenital causes of stridor.

## Investigations

- Vital signs (temperature, pulse, respiratory rate, pulse oximetry).
- If diagnosis in doubt or severe: soft tissue neck x-rays - lateral (widening of the hypopharynx) and AP ('steeple sign' of the proximal trachea).

## Severity scoring

?Usefulness. e.g. Westley Modified Croup Score (0-17: if <4 mild, 4-6 mod, >6 sev croup).

Clinical Feature	Degree	Score
Stridor	None	0
	At rest on auscultation	1
	At rest without auscultation	2
Recession	None	0
	Mild	1
	Moderate	2
	Severe	3
Air entry	Normal	0
	Decreased	1
	Severely decreased	2
Cyanosis	None	0
	With agitation	4
	At rest	5
Consciousness level	Normal	0
	Altered	5

## Management

- Keep child upright and comfortable. Minimise upsetting examinations or procedures.
- **Oxygen** as necessary to keep  $\text{SaO}_2 > 93\%$ .
- **Adrenaline** - If moderate to severe i.e. significant stridor at rest and signs of respiratory distress.
  - Dose: 0.5ml/kg 1:1000 neb, max 5ml
- Corticosteroid options:
  - **Dexamethasone**: 0.15-0.6mg/kg po/im
  - **Prednisolone**: 1mg/kg po
  - **Budesonide**: 2mg/kg neb
- Intubation/ICU
  - Required in less than 2%
- Admission if:
  - <6mo old
  - Severe, or if repeated adrenaline
  - Persistent stridor at rest
  - Social situation
- Discharge criteria
  - Observation for 4 hours if adrenaline given (to watch for 'rebound').
  - No stridor at rest.
  - Advice given about re-occurrence (rate about 5%) +/- extra steroid doses.

## Comments

- Adrenaline - rapid symptomatic relief, but effect only lasts 2-4 hours and it doesn't shorten the duration of the illness.
- Corticosteroids have been shown to reduce:
  - the severity of symptoms for up to 12-24 hours
  - the need for adrenaline or intubation
  - hospital admissions
  - the length of inpatient care
- Other corticosteroid points:
  - Low dose dexamethasone (0.15mg/kg) shown to be as efficacious as high dose (0.6mg/kg) in some studies.
  - Prednisolone less extensively trialled, but often used as an equivalent to dexamethasone. Latest study showed dex has less re-presentations.
  - Budesonide is as effective as adrenaline at 2 hours, however the latter has a more rapid onset.
  - Budesonide more expensive than dexamethasone & nebuliser delivery often more upsetting than oral.
  - Dexamethasone not easily available as a liquid so prednisolone may be easier to administer.
- Antibiotics - unlikely to be a benefit in a viral disease.
- Humidified/cool air - only anecdotal, but still the most common pre-hospital treatment.