



A 2-year-old child with cough and respiratory distress

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Case history

A 2-year-old girl was brought to the hospital for evaluation of a harsh cough and difficulty breathing. She developed a cold with a runny nose 3 days ago and has been feeling ill. Her mother said she was awake most of the previous night with a barking cough and noisy breathing.

The physical examination revealed an otherwise healthy child with persistent inspiratory stridor and lower rib retractions at rest. Her vital signs included a pulse of 130/min, a respiratory rate of 40/min, a BP of 90/60 mmHg, and an axillary temperature of 37.3°C. Auscultation revealed an inspiratory stridor transmitted through the lung fields. There was no cyanosis and no other abnormal physical signs.

Questions to ask

- What is the most likely diagnosis?
- What serious life-threatening conditions must be considered in this patient?
- Can the patient be treated at home with simple methods, such as exposure to steam or other forms of humidified air?
- Should antibiotics be prescribed?
- Should the child be hospitalized for safety reasons and specialized treatment?

Discussion

The provisional diagnosis for this presentation is laryngotracheal bronchitis (croup), which is usually caused by parainfluenza virus, but

other respiratory viruses (influenza, adenovirus, and respiratory syncytial virus) can cause an identical illness.

Although uncommon, croup is a life-threatening illness. Other serious conditions to consider are influenza (SARS or avian influenza), pneumonia, epiglottitis, and inhalation of a foreign body.

In the current case, croup was classified as grade 2, which requires careful observation and anti-inflammatory treatment.

Grading system for croup

CROUP SCORE

Grade 1 – Stridor at rest without chest retractions and no distress

Grade 2 – Stridor at rest with sternal and chest wall retractions

Grade 3 – Marked respiratory distress, as indicated by irritability, pallor, cyanosis, tachycardia, and exhaustion, with impending airway obstruction.

Management

The patient had grade 2 croup (*n.b.*, grade 2 or 3 croup require close observation). With grade 2 croup, the serious symptoms may resolve in approximately 3 days, but during that time airway obstruction is a potential problem. As a general rule, children with stridor at rest or other signs of respiratory distress require hospitalization or at least close observation in a medical facility.

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Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Received 24 March 2014;

Accepted 9 May 2014



The main indications for special observation and care are as follows:

- Respiratory distress or stridor at rest
- Uncertainty of diagnosis
- Social reasons

In the current case, first-line treatment was corticosteroids. Oral, intravenous, intramuscular, and nebulized corticosteroids are all effective options. Oral corticosteroids (prednisolone [1 mg/kg] or dexamethasone [0.3 mg/kg]) can be administered as a once daily dose for 1 or 2 days. Nebulized budesonide should be considered for children who have vomited after taking oral steroids. Some children are upset by the nebulization process.

Antibiotics and anti-tussives are not recommended for croup.

Steam and humidified air

Traditional humidified air or 'mist' therapy, such as in a mist tent, is no longer recommended as controlled studies have not

demonstrated any significant benefit. However, we do know that children with mild croup benefit from being taken outdoors, especially if the atmosphere is humid, the air is moist, or if there is a steamy atmosphere in the home. Parents should not be discouraged from trying this treatment approach, but must be warned of the dangers of burns from steam in the home.

Nebulized adrenaline

Nebulized adrenaline should be used for grade 3 croup, or grade 2 croup not responding to corticosteroids. The dose of nebulized adrenaline is 5 mL of 1:1000 adrenaline in the nebulizer (run with oxygen at 8 L a minute). This dose can be repeated if there is an unsatisfactory response after 10–15 min. The fluid from the ampoules of adrenaline is simply emptied into the nebulizer. Some authorities regard nebulized adrenaline as first-line therapy

Conflict of interest

The author declares no conflict of interest.