



Croup & Bronchiolitis

Dr Zahra Roshanzamir



Fars Pediatric Association

چهارمین کنگره دوسالانه
استاد امیر حکیمی
The 4th Pediatric Congress
Professor Amirhakimi
FARS SHIRAZ
۲۵ اردیبهشت ۱۴۰۳

بزرگوارکننده:
انجمن متخصصین کودکان استان فارس
گروه کودکان دانشگاه علوم پزشکی شیراز

رئیس هیئت مدیره: دینار علمی کنگره
نایب رئیس هیئت مدیره: دکتر سید محسن دهقان
دبیر اجرایی کنگره: دکتر حمید محمدی
دبیر هیئت مدیره: دکتر حمید محمدی

دارای ۲۰ امتیاز
بازآموزی مداوم

وبسایت رسمی کنگره
جهت ثبت نام حضور در کنگره
ارسال پوستر و سایر اطلاعات تکمیلی
www.amirhakimi.farsped.com

تلفن های تماس با دبیرخانه علمی کنگره
۰۹۱۷۹۷۲۸۰۱۷ - ۳۴۴۷۴۹۸ (۰۷۱)
تلفن های تماس با دبیرخانه اجرایی کنگره
۰۹۱۷۰۴۵۷۵۳۹ - ۹۱۷۵۶۷۹۲۸۳

مجری برگزاری: **زوسپد**



Viral Laryngotracheobronchitis

- Viral LTB is the most common cause of infective upper airway obstruction in the pediatric age group. Affected children are usually of **preschool age**, with a peak incidence **between 18 and 24 months** of age. Viral LTB episodes become **uncommon beyond 6 years of age**
- Reported annual incidence rates in preschool children vary from 1.5% to 6%, but less than 5% of these require hospital admission, and only 1% to 2% of those admitted require endotracheal intubation and intensive care

Etiology

- The most common etiologic agents are **the PIVs**, of which PIV 1 is found most frequently and leads to epidemics.
- **Together the PIVs account for more than 75% of viral LTB cases.** Herpes viruses and influenza viruses tend to cause a more severe and protracted form of the disease. LTB can also occur with some systemic infections, such as measles and, less commonly, mycoplasma

Clinical presentation

- **Mild**

Most children are affected mildly by viruses that cause LTB. Children have a **barking cough and a hoarse cry** or voice; these symptoms are worse in the evening and at night. They have inspiratory stridor on exertion, **but stridor at rest is usually absent, as are other signs of respiratory distress.**

- **Moderate**

Features of moderate viral LTB include those discussed earlier, but with **inspiratory stridor present at rest**, as well as a degree of **respiratory distress manifest by chest wall recession, tachypnea, tachycardia**, but children remain interactive and are able to take at least liquids orally.

Severe

Worrisome signs include those of increasing respiratory distress, with the child appearing anxious and tired. Drooling may occur (but not as commonly as in epiglottitis), and the child will often refuse liquids

- However, the child with viral LTB will **not appear toxic, with high fever and flushed face, as do those with the classic signs of bacterial epiglottitis** . Another difference is in the nature of the cough; a **harsh, barking cough is not commonly associated with epiglottitis (in which there is often a muffled cough and cry)**.
-



- **Restlessness and agitation are late signs of airway obstruction of any cause, as is cyanosis, pallor, or decreased level of consciousness**



4th
The

Pediatric Congress Professor Amirhakimi

14-17 May 2024-Fars-Shiraz

چهارمین کنگره دوسالانه کودکان استاد امیر حکیمی

۲۵ - ۲۸ اردیبهشت ۱۴۰۳ - فارس - شیراز



Infectious and Noninfectious Causes of Acute Upper Airway Obstruction

Infectious

- Viral laryngotracheobronchitis
- Epiglottitis
- Bacterial tracheitis
- Diphtheria
- Retropharyngeal abscess
- Peritonsillar abscess
- Infectious mononucleosis

Noninfectious

- Foreign body
- Trauma
- Caustic burns
- Spasmodic croup
- Angioneurotic edema
- Hypocalcemia (e.g., hypoparathyroidism)

Management

- Management of viral LTB must be based on **clinical assessment of severity**.
- **Supportive Care**
Children with **mild croup** can be managed at home. They should be treated with plenty of fluids and antipyretics as required.
- no role for the routine use of antibiotics in the absence of other features suggestive of bacterial infection.

- **Humidification**

Both at home and in the hospital setting, humidified air (either steam or cool mist) has been used for more than a century to produce symptomatic relief from croup. Despite this, **there is very little supportive evidence.**

Corticosteroids

MILD and MODERATE CROUP

- A practical approach might be to use **dexamethasone**, if available, at a dose of **0.15 mg/kg**. If this preparation were not available at a home visit, prednisolone (at an equivalent dose of 1 mg/kg) could provide a useful substitute.
- Due to the short duration of symptoms in a typically episode of croup, **one dose of steroid is usually sufficient treatment**. However, a second dose should be considered if residual symptoms are still present the following day, and can be given to the parents to administer at their discretion.

Nebulized Epinephrine (Adrenaline)

- Any child who has **severe croup**, and it should be considered for those with **moderate** signs croup, depending on **the signs of respiratory distress and possible response to corticosteroid administration**.
- **Multiple doses may be administered**, the requirement for this must lead to consideration of the need for intensive care management

Nebulized Epinephrine

- The recommended dose is **0.5 mL/kg (to a maximum of 5 mL) of the 1 : 1000** preparation that is put undiluted into the nebulizer cup.
- **Intramuscular epinephrine** is **not used in severe stridor**, so it is important to ensure **the stridor is not due to acute anaphylaxis**, in which case it should be given
- **Discharge home is safe after 3 to 4 hours of observation if the child has made significant improvement**

Bacterial Tracheitis

- Bacterial tracheitis has also been known as **bacterial LTB** and pseudomembranous croup.
- The most common pathogen is *S. aureus*, although other organisms implicated include HiB, α -hemolytic *Streptococcus*, *Pneumococcus*, and *M. catarrhalis*.

Clinical Features

The clinical picture is initially similar to that of viral LTB, with mild fever, cough, and stridor for several days. However, the patient's condition deteriorates rapidly, with a high fever and often a toxic appearance, with respiratory distress and airway obstruction

- The clinical picture differs from that of epiglottitis in that its onset tends to be more insidious. Patients **have a substantial brassy cough, are more able to lie flat, and tend not to drool**
- Children **are more ill than with simple viral LTB and do not respond to expected therapies (e.g., corticosteroids or nebulized epinephrine).**

Treatment

- Many patients (especially younger ones) require **endotracheal intubation and mechanical ventilation to overcome airway obstruction usually for 3 to 7 days. Frequent tracheal suction is necessary**
- **Intravenous broad-spectrum antibiotics** are given, and these can be refined once cultures and antibiotic sensitivities are known, usually for **10 to 14 days**



Bronchiolitis

- A “classic” case would be an **infant aged 3 to 5 months of age** who **develops coryza and over the subsequent 3 to 4 days has increased difficulty with breathing**, and consequent inability to maintain adequate oral feeding.
- **Wheeze or crackles** can be heard on auscultation. The time to peak symptoms of 4 days.

Improvement occurs by days 5 to 7, though a characteristic harsh cough may persist for 21 days or more.



- Bronchiolitis has a viral etiology, with **RSV the most common cause**
- Other viruses associated with bronchiolitis are human rhinovirus , influenza, coronavirus, human metapneumovirus, adenovirus, parainfluenza virus

- Physical findings include an increased respiratory rate, chest recession, use of accessory muscles, wheezing, crackles, and reduced arterial oxygen saturations
- Respiratory rate is a key marker of disease severity, with $\geq 60/\text{min}$ considered severe and $\geq 70/\text{min}$ critical.
- Oxygen saturation may be improved (at least temporarily) by removal of nasal secretions.

Radiography

- Chest radiography **is not required to confirm a diagnosis of bronchiolitis**. A chest radiograph often leads to increased diagnostic uncertainty as the features may be similar to those of pneumonia (atelectasis, mucous plugging, and loss of volume) and consequently lead to greater inappropriate use of antibiotics.
- Chest radiography should be reserved for a child who is atypical, for example, showing **persistently focal crackles, a temperature remaining above 39°C despite antipyretics, or respiratory failure requiring critical care support**

Differential diagnosis

- Differential diagnosis includes bacterial pneumonia or an alternative cause of crackles, wheeze, and increased work of breathing in a young child. **Persisting crackles (crepitations) in one lung zone, fixed focal wheeze, persistent pyrexia ($>39^{\circ}\text{C}$) or persistently increased work of breathing** in a child who appears otherwise recovered warrant further evaluation.



4th
The

Pediatric Congress Professor Amirhakimi

14-17 May 2024-Fars-Shiraz

چهارمین کنگره دوسالانه کودکان استاد امیر حکیمی

۲۵ - ۲۸ اردیبهشت ۱۴۰۳ - فارس - شیراز



- In children with more severe disease, there may be a role for **antibiotics** as bacteria are isolated in 33% to 44% of lavage samples in children with **severe bronchiolitis who are intubated and ventilated**

- Management of bronchiolitis is supportive, assisting hydration and hypoxemia until improvement. With increased respiratory rate and nasal secretions, oral feeding is challenged, and those with severe disease require assistance with feeding by enteral or parenteral means. The threshold for supporting hydration is typically when an infant's intake is reduced to 50% to 75% of usual volume.
- In children admitted to hospital with bronchiolitis, management at a threshold of 90% SpO₂ is safe
- CPAP has some benefit in bronchiolitis, and may prevent deterioration when used early.