

## **acute Stridor in children**

### learning objectives

- 1-clinical evaluation of child with acute stridor
- 2- detection of life-threatening causes of acute stridor
- 3-emergency treatment of acute stridor in children
- 4- family counseling regarding home care, medications , and danger clinical features

Stridor is a harsh , high-pitch respiratory sound usually inspiratory sound (but may be biphasic(inspiratory and expiratory )

causes of acute stridor

- 1--Laryngotracheobronchitis, commonly known as croup
- 2- acute Epiglottitis (supraglottitis)
- 3--laryngeal foreign body as food such as nuts, popcorn
- 4-- Bacterial tracheitis
- 5- Diphtheritic croup

### **Clinical grading of stridor**

Grade 1(exertional stridor ) stridor only appear during crying or exercise

Grade 1I(stridor at rest ) stridor at rest and becomes worse with crying

Grade 1II(stridor with retractions) stridor at rest with suprasternal and supraclavicular retractions

Grade 1V (stridor with cyanosis) stridor with retractions ,cyanosis and disturbed consciousness

.Laryngotracheobronchitis (croup )

### **The causes**

1-Parainfluenza viruses ( types 1,2, and 3 ) is the predominant cause of . 75%(croup)

.2- Other viruses : influenza A and B , adenovirus , RSV , Measles

Mycoplasma pneumonia

### Epidemiology

Most patient between 3 months and 5 year with peak in the 2nd year of life

Higher incidence in male and during winter

### **clinical manifestations**

URT infections with some combination of rhinorrhea, pharyngitis ,mild cough and low grade fever 1 to 3 days

the child then develops the characteristic "barking "cough ,hoarseness, and inspiratory stridor

symptoms are worse at night ,decreasing over several days and resolve completely within a week

Agitation and crying greatly aggravate the symptoms and signs

### **Diagnosis**

Croup is a clinical diagnosis

Radiographs of the neck may show the typical subglottic narrowing or “steeples” sign on posteroanterior view

**Treatment of croup** (laryngotracheobronchitis) The mainstay of treatment is airway management .most children can be managed at home safely .treatment in the hospital by

1-Use of cool mist : by tent or face mask to moisten airway secretions.

2-Nebulized epinephrine decrease in the laryngeal mucosal edema. .

-indications for the administration of nebulized epinephrine include

a.Moderate to severe stridor at rest.

b-The need for intubation

c. Respiratory distress and hypoxia

d- When stridor does not respond to cool mist

patient may safely discharged home after 2-3 hr period of observation provide they have

1- no stridor at rest 2-normal air entry 3- normal level of consciousness

3-corticosteroid decrease the edema in the laryngeal mucosa through their anti-inflammatory action, .I.M dexamethasone , oral dexamethasone and .nebulized budesonide have equivalent clinical effect

Antibiotic is not indicated in croup

4-helium-oxygen (heliox) have similar clinical improvement as racemic or nebulized epinephrine

### **Indication of hospitalization**

1-progressive stridor 2-sever stridor at rest 3-resp distress ,hypoxia

,cyanosis 4-depress mental status

### **acute epiglottitis (supraglottitis )**

It is caused by Haemophilus influenzae type B . Most often occurs between the ages of 2-7 years

an acute fulminating course of high fever ,sore throat ,dyspnea and rapidly progressing respiratory obstruction

within a matter of hours, the patient appears toxic ,swallowing is difficult(dysphagia) ,and breathing is labored

drooling is usually present and the neck is hyperextended in an attempt to maintain the airway

the child may assume the tripod position sitting upright and leaning forward . with chin up and mouth open while bracing on the arms

a brief period of air hunger with restlessness may be followed by rapidly increasing cyanosis and coma

-stridor is a late finding .

### **Diagnosis of epiglottitis**

Suspected on observing the patient's

1- clinical features(toxic ,drooling ,high fever

2-The diagnosis is confirmed by

direct visualization of a large , ‘‘cherry-red’’ swollen epiglottis by laryngoscope This procedure should be performed in operating room or ICU with a competent surgeon and anesthesiologist prepared to place a nasotracheal tube or to perform a tracheostomy (because procedure may .(cause complete respiratory obstruction

3-Blood culture

4- Culture of epiglottic surface

5- lateral x-ray of upper airway may show ‘‘thumb sign- differentiating epiglottitis from croup

	<b>croup</b>	<b>epiglottitis</b>
<b>stridor</b>	<b>loud</b>	<b>quite</b>
<b>voice</b>	<b>hoarse</b>	<b>muffled</b>
<b>dysphagia</b>	<b>no</b>	<b>yes</b>
<b>drooling</b>	<b>no</b>	<b>yes</b>
<b>Sitting-up posture</b>	<b>no</b>	<b>yes</b>
<b>Barking cough</b>	<b>Yes</b>	<b>no</b>
<b>toxic</b>	<b>no</b>	<b>Yes</b>
<b>fever</b>	<b>low grade</b>	<b>High grade</b>

### **Treatment of epiglottitis**

Epiglottitis is a medical emergency

Artificial airway by nasotracheal intubation or by tracheostomy to all patients regardless the severity of respiratory distress ( usually for 2-3 days ) , should be done in the operating room or ICU. after insertion of artificial airway ,the patient should improve immediatly and respiratory distress and cyanosis should disappear, epiglottitis resolved few days after antibiotic .and patient may be extubated .Oxygen supplement

Parenteral antibiotics( cefotaxime

. ceftriaxone ) for 7-10 days

Nebulized epinephrine and corticosteroids are ineffective

### **bacterial tracheitis**

is bacterial upper airway disease is mainly cause by staph. aureus ,which include high fever ,purulent airway secretions, and absence of the classic finding of epiglottitis

### **Treatment of bacterial tracheitis**

1--Antibiotic therapy usually includes antistaphylococcal agents

2-artificial airway is indicated

3-oxygen supplement is necessary-

prognosis is excellent for most patients , patients usually become afebrile within 2-3 days of antibiotics

### **Diphtheria**

is an acute toxic infection caused by *Corynebacterium* species, typically *Corynebacterium diphtheriae*

gram-positive bacilli

Respiratory Tract Diphtheria

tonsils or pharynx (94%), with the nose and larynx the next 2 most common sites

incubation period of 2-4 days

### **clinical features**

In tonsillar and pharyngeal diphtheria, sore throat : mild fever, dysphagia, hoarseness, malaise, or headache. mild pharyngeal injection is followed by unilateral or bilateral tonsillar membrane formation, which can extend to involve the uvula (which may cause toxin-mediated paralysis), soft palate, .posterior oropharynx, hypopharynx, or glottic areas

Underlying soft tissue edema and enlarged lymph nodes can cause a bull-neck appearance

fatality due to airway compromise or toxin-mediated complications

### **Diagnosis**

Specimens for culture should be obtained from the nose and throat and any other mucocutaneous lesion. Evaluation of a direct smear using Gram stain or specific fluorescent antibody is unreliable

### **treatment**

Specific antitoxin is the mainstay of therapy. Because it neutralizes only free toxin

Antitoxin is administered as a single empirical dose of 20,000-120,000 U . based on the degree of toxicity, site and size of the membrane, and duration ..of illness

intravenous immunoglobulin preparations contain low titers of antibodies to diphtheria toxin; their use is not proven or approved

antimicrobial therapy is to halt toxin production, treat localized infection, and prevent transmission of the organism to contacts. *C. diphtheriae*,

including penicillins, erythromycin, clindamycin, rifampin

erythromycin (40-50 mg/kg/day divided every 6 hr by mouth [PO] or

intravenously [IV]; maximum 2 g/day), aqueous crystalline penicillin G

•[(100,000-150,000 U/kg/day divided every 6 hr IV or intramuscularly [IM or procaine penicillin (25,000-50,000 U/kg/day divided every 12 hr IM) for 14 days

### **choking**

Choking (or foreign body airway obstruction) is most common in late infancy and early childhood (6months -4 years ).the most inhaled objects are .(food (as peanuts) and small objects (buttons ,beads ,coins ,safety pins

### **Clinical features**

Sudden onset of choking or coughing episodes accompanied by wheezing are highly suggested of an airway foreign body ,the most serious complication of foreign body aspiration is complete obstruction of the airway . there are three stages of symptoms

1-initial event :violent paroxysms of coughing ,choking ,gagging and possibly airway obstruction occur immediately when the foreign body is aspirated

2-asymptomatic interval :the foreign body become lodged ,this is responsible for delay diagnosis

3-complication :as obstruction ,infection , pneumonia ,hemoptysis and atelectasis

### **Diagnosis**

History A positive history must never be ignored. A negative history may be misleading

Exam depend on the site of the foreign body there may be  
Cyanosis ,dyspnea ,limited chest movement, tracheal deviation  
hyperresonance percussion note  
chest auscultation decrease air entry,localized rhonchi and crepitation

### **Investigations**

CXR radiopaque foreign body ,pneumothorax atelectasis, hyperinflated chest ,emphysema

Bronchoscopy is diagnostic and therapeutic using flexible type for diagnosis and rigid type for diagnosis and treatment

**Physical maneuvers** to clear the airway are indicated when the clinical . suspicious .the maneuvers are different according to the age of the patient  
1-maneuvers in infants a combination of 5 back blows and 5 chest thrusts  
2-maneuvers in children a series of 5 back blows and 5 abdominal thrusts  
. if the child is not cyanotic and has adequate air exchanged ,he should be allowed to cough and breathe without interference

### **Family counseling for patient with acute stridor**

- Keep the child calm
- Acute stridor could be mild problem or life-threatening condition
- Educate the family about danger signs and home care of baby
- Ask them about any possible history of choking
- Teach about medications that could be given at home