

IN THE NAME OF GOD

Stridor Due to Allergy

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Stridor definition

- Latin verb stridere , meaning to make a harsh noise or shrill sound, as to creak
- An abnormal, monophonic ,high-pitched, musical continuous breathing sound
- Typically inspiratory
- Occasionally heard on expiration
- Throughout the respiratory cycle
- The sound is caused by narrowing of the upper or central airway
- Caused by a blockage in the throat or voice box (larynx)
- Children are at higher risk
- Narrower airways in children than adults

- Sound of stridor depends on location of the obstruction
- Stridor isn't a condition
- Symptom of something else
- Originating from the extra thoracic area
- More pronounced during inspiration
- Abate during exhalation
- Critical and fixed airway obstruction results in biphasic inspiratory and expiratory stridor
- Compression of the proximal trachea result in expiratory stridor
- Intra thoracic airway compression usually give rise to coarse wheezing rather than stridor

Common causes of stridor include:

- Airway injury
- Allergic reaction
- Problem breathing and a barking cough (croup)
- Diagnostic tests (bronchoscopy or laryngoscopy)
- Epiglottitis, inflammation of the cartilage that covers the windpipe
- Inhaling an object (peanut or marble, foreign body aspiration)
- Swelling and irritation of the voice box (laryngitis)
- Neck surgery
- Use of a breathing tube for a long time
- Secretions such as phlegm (sputum)
- Smoke inhalation or other inhalation injury
- Swelling of the neck or face
- Swollen tonsils or adenoids (tonsillitis)
- Vocal cord cancer
- Swollen tissues of the throat or upper airway
- Spasm of the airway muscles or the vocal cords
- Recently extubated patient

Croup definition

- The term "croup" is describe acute-onset stridor
- caused by a range of upper respiratory conditions in children

Common causes of croup include:

- Viral croup (laryngotracheitis)
 - **Spasmodic croup**
 - Bacterial tracheitis
 - Epiglottitis
 - Retropharyngeal abscess
 - Peritonsillar abscess
 - Inducible laryngeal obstruction (vocal cord dysfunction)
 - Foreign body aspiration
 - Anaphylaxis
 - Airway burns
 - Iatrogenic causes
- Postextubation
- Therapeutic hypothermia

Differences between stridor and wheezing

- Stridor sound had a similar frequency to that found with asthma
- Stridor was more intense over the neck than over the chest reverse in asthmatics
- Musical sounds in stridor occurred during inspiration
- In asthma were predominantly expiratory
- So ,Major difference are:

The timing of the sound

The prominence of the sound over the neck

What is the difference between **croup** and **spasmodic croup**?

Viral croup:

- Para influenza virus types (1, 2) most commonly
- Acute laryngotracheitis
- Influenza A and B
- Measles
- Adenovirus
- Respiratory syncytial virus (RSV).

Spasmodic croup:

- Caused by viruses
- Acute laryngotracheitis
- Lack signs of infection

- Patients **without fever** or upper respiratory infection may have:
- Acute **allergic reaction**
- Aspirated **foreign body**
- Acute allergic reaction severe enough to cause stridor usually has other manifestations:
- Airway edema(oral or facial edema, wheezing)
- Anaphylaxis (itching, urticaria).

- Associations between **croup** and **IgE antibody** production
- Between **croup** and **atopic allergic** disorders
- Presence or absence of IgE antibody
- An increased association between **allergy** and **recurrent croup**
- Children with croup are more likely to produce IgE antibodies than normal children without croup
- Association between the production of **IgE antibody to certain respiratory viral infections** and the development of croup
- An increased association between **croup, asthma** and nonspecific bronchial hyperresponsiveness associated with asthma

Spasmodic croup

- Characterized by brief, **recurrent** episodes of stridor
- Occurring at night
- The onset and cessation of symptoms are abrupt
- **Duration** of symptoms is **short**
- Symptoms subsiding by the time of presentation for medical attention
- **Fever** is typically **absent**
- Mild upper respiratory tract symptoms (coryza) may be present
- Episodes can recur within the same night and for two to four successive evenings

- **A striking feature of spasmodic croup is its recurrent nature**
- Alternate descriptive term "**frequently recurrent croup**"
- May be a **familial predisposition** to spasmodic croup
- May be more common in children with a **family history of allergies**
- There is some clinical overlap with **atopic diseases**
- Sometimes referred to as "**allergic croup**"

- **Spasmodic croup** may be difficult to distinguish from **viral croup**
- **Episodic** nature of symptoms
- Relative **wellness** of the child **between attacks**
- In viral croup, symptoms are continuous
- Initial presentation can be dramatic
- Clinical course is usually **benign**
- Symptoms are almost always relieved by :
Comforting the anxious child
Administering humidified air
- Recurrent episodes of croup also are labeled "**atypical croup**" or "**recurrent croup**," with varying definitions and etiologic considerations

Diagnosis

- On direct laryngoscopy may demonstrate **non inflammatory edema**
- Suggesting that there is no direct viral involvement
- In a retrospective case series of **197 children with recurrent croup** (endoscopy)
 - 20 % had abnormal esophageal biopsies (Reflux esophagitis, Eosinophilic esophagitis, candidal esophagitis)
- 64% **Asthma**
- 60% **Gastro esophageal reflux disease**
- 48% **Seasonal allergies**
- 9% Subglottic stenosis, cyst, and hemangioma

- A child with recurrent episodes of classic viral croup
- Have an underlying condition
- Predisposes to significant narrowing of the upper airway
- Recurrent croup-like symptoms , outside of age range for "viral croup" (6months -3years)
- Recurrent episodes that do not appear to be simple "spasmodic croup"
- Suspicion for airway lesions:

Gastroesophageal reflux

Eosinophilic esophagitis

Atopic conditions


How long does spasmodic croup last?

- Unlike viral croup, symptoms of spasmodic croup can resolve within **8 to 10 hours**
- Can recur with the same acute onset by nightfall(sometimes on up to 3- 4consecutive nights)
- 'wet' cough and mucus-like nasal discharge

Allergic reaction or acute Angioneurotic edema

- Rapid onset **without** antecedent cold symptoms or **fever**
 - Primary manifestations :
 - **Swelling** of the lips and tongue
 - Urticarial **rash**
 - Dysphagia without hoarseness
 - Inspiratory **stridor**
 - **History of allergy** or a
 - **Previous attack** (may be)
 - **Mild URI** symptoms may be
- Symptoms typically occur **at night** , intermittent, abrupt and brief episodes within the same night or on successive nights
- Recurrences** are common.
- In children 6 months to 3 years of age

Diagnosis

- Clinical features
 - Angioedema typically affects the skin and mucosal tissues of the face, lips, mouth, and throat, larynx, extremities, and genitalia
 - Asymmetric pattern
 - Can also affect the bowel wall
 - Colicky abdominal pain
- 
- A close-up photograph of a person's lips, showing significant swelling (angioedema). The lips are noticeably enlarged and appear bright red, with some white, frothy secretions visible on the surface. The surrounding skin is pale and appears slightly irritated.
- Episodes of isolated angioedema characteristically peak and then gradually resolve over the hours (mild) or 3-5 days (severe)
 - Diagnostic testing is typically not necessary
 - Humidified air inhalation does not moderate croup
 - Corticosteroids should be administered to patients with croup of any severity

Pathogenesis

- Two types of angioedema can be distinguished:
- 1-mast cell-mediated angioedema (allergic reactions)
- Due to foods
- Insect stings
- Signs and symptoms :
- Urticaria, Flushing,
- Generalized pruritus,
- Bronchospasm, Throat tightness
- Hypotension
- **Anaphylaxis** /should be treated immediately with epinephrine
- Episodes usually begins within minutes of exposure to the allergen, builds over a few hours, and resolves in 24 to 48 hours

2- brady kinin-mediated angioedema

- Angiotensin-converting enzyme [ACE] inhibitor-induced angioedema
- Hereditary angioedema [HAE]
- Not associated with urticaria, bronchospasm, or other symptoms of allergic reactions
- More prolonged time course, over 24 - 36 hours
- Resolving within 2-4 days
- Relationship between the trigger and the onset of symptoms is often not apparent
- Other causes of angioedema with unknown mechanism

Life-threatening situations

- Angioedema is usually a benign and transient condition
- Can be life-threatening when severe angioedema of the larynx, upper airway, or tongue results in airway obstruction
- In anaphylaxis and in bradykinin-mediated forms of angioedema
- Airway protection must be given priority over a comprehensive diagnostic evaluation

Evaluation

- following laboratories be performed in all patients with isolated **angioedema**:
- CBC differential, liver function tests, CRP ,ESR , C4
- Depressed C4 levels /hereditary or acquired C1 inhibitor deficiency
- CRP and ESR elevated during infections /malignancy / inflammatory diseases

- **Angioedema with anaphylaxis**
- A serum total tryptase level drawn
- Confirming that the episode was a mast cell-mediated event
- **Angioedema due to a suspect allergen**
- In an allergic reaction tests for immunoglobulin E (IgE) antibody
- Allergy skin testing is more sensitive in many cases
- Requires referral to an allergy specialist
- **Idiopathic angioedema**
- Recurrent episodes of angioedema without urticaria
- No explanation found after a thorough evaluation exclude allergic disorders, drug reactions, and defects in complement pathways

Management of angioedema

- Depends upon the :
 - location
 - Acuity
 - Severity
 - Mechanism believed responsible
- Immediate assessment and ongoing protection of the **airway** is critical in any patient with angioedema near or affecting the larynx, mouth, soft palate, or tongue

Treatment

- **Angioedema with anaphylaxis**
- Intramuscular epinephrine, intravenous fluids, and oxygen
- Epinephrine autoinjectors
- Antihistamines and glucocorticoids are the main therapies for isolated angioedema that appears to be allergic
- Anaphylaxis should be treated with intramuscular epinephrine of 1:1,000 is equivalent to 1 mg/mL and 1:10,000 is equivalent to 0.1 mg/mL
- because antihistamines are not sufficient

Allergic Angioedema

- H1 and H2 **antihistamines** at standard doses
- **Glucocorticoids** (the dosing in acute angioedema has not been specifically studied):
- Methylprednisolone, 60 to 80 mg IV initially, oral preparations ,tapered over five to seven days
- Prednisone (20 to 40 mg orally daily) in adults or prednisolone (0.5 to 1 mg/kg/day) in children, tapered over five to seven days in patients discharged to home
- The use of antihistamines for angioedema is extrapolated from the treatment of acute urticaria /angioedema, as the data on isolated allergic angioedema are scant

- **Recurrent, idiopathic angioedema**

- A trial of non sedating antihistamines administered twice daily is suggested as an initial intervention to prevent additional angioedema episodes
- Without urticaria
- Such patients should be referred to an allergy specialist for further evaluation

- **Bradykinin-mediated angioedema**

- C1 inhibitor concentrate
- Icatibant
- Fresh frozen plasma (FFP)
- Agents that interfere with the production or action of bradykinin

Epinephrine dose

- General dosing or health care settings:

IM, SubQ: **0.01 mg/kg** (0.01 mL/kg/dose of 1 mg/mL solution)
not to exceed: Prepubertal child: 0.3 mg/dose; adolescent: 0.5 mg/dose; administered every 5 to 15 minutes

- If anaphylactic symptoms persist after first dose, may repeat dose in 5 to 15 minutes
- IM, SubQ: **15 to 29 kg: 0.15 mg / ≥ 30 kg: 0.3 mg** ; if anaphylactic symptoms persist, dose may be repeated based on severity and response to initial dose; more than 2 sequential doses should only be administered under direct medical supervision
- Alternate dosing:
- **7.5 to <25 kg: 0.15 mg / ≥ 25 kg: 0.3 mg**

DISPOSITION AND REFERRAL

- In patients who do not require admission to the hospital
- Observation until there are unequivocal signs of improvement
- Patients with severe or recurrent angioedema
- Angioedema/urticaria
- No cause is readily apparent,
- Should be referred to a specialist for further evaluation
- An allergy specialist is most appropriate in most situations

