



SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai

**DEPARTMENT OF OPERATION THEATRE AND ANESTHESIA
TECHNOLOGY**

COURSE NAME: MEDICINE

II YEAR

UNIT I

TOPIC 1:**BRONCHIAL ASTHMA**



CASE HISTORY

Mr. Ramesh , 42 yrs male from Erode brought to the emergency department with complaints of Cough, Breathlessness, Low grade continuous fever,and He was negative for covid-19 and the saturation also low and he was prescribed for Oxygen administration by the physician , How will you manage the case ?



ANATOMY-LUNGS





INTRODUCTION

- Asthma is a disease characterized by:
- Chronic Airway Inflammation
- Increased Airway Responsiveness
- Airways Obstruction
- Variable over Short Periods of Time
- Reversible with Treatment



MEANING

- The term asthma is derived from a Greek word meaning ‘**panting**’ or ‘**labored breathing**’.



DEFINITION

- Bronchial asthma is a chronic , inflammatory disease of the airways, characterized by
- airflow obstruction,
- bronchial hyperactivity
- mucous production.



DEFINITION CONT..



- Asthma is characterized by inflammation of the mucosal lining of the bronchial tree and spasm of the Bronchial smooth muscles
(Bronchospasm).

This causes narrowed airway and air trapping.
(which is why it is considered an obstructive disorder.)



TRIGGERING FACTORS



- Tobacco
- Smoke
- Cold air
- Respiratory viral infections
- Emotional stress
- Aspirin, beta blockers.



ETIOLOGY/PREDISPOSING

- **Predisposing factors:**

1. Atopy /Allergy
2. Female gender

- **Causal factors:**

1. exposure to indoor and outdoor allergens.

Allergens are: Polen, Foods, Medications, Animal dander, Air pollution, dust etc



- Occupational sensitizers
- Contributing factors:
 1. Respiratory infections
 2. Air pollution
 3. Active /passive smoking
 4. LBW



CLASSIFICATION

BRONCHIAL ASTHMA

- ➔ Early onset (or) Atopic Asthma
- ➔ Late onset (or) Non –Atopic Asthma
- ➔ Mixed asthma
- ➔ Occupational
- ➔ Exercise induced

CLASSIFICATION

EARLY ONSET-ASTHMA

- Early onset of age
- Atopic individuals
- External allergens have strong role
- Positive personal / family history of allergic diseases- rhinitis, urticaria, eczema
- Increased levels of IgE in the serum.
- Positive skin hypersensitivity test

LATE ONSET ASTHMA

- Late age of onset
- Non-Atopic individuals
- External allergens have no-role
- Negative personal/ family history of allergic diseases
- Normal levels of IgE in the serum
- Negative skin hypersensitivity test

- Pathogenesis of asthma includes two major factors:
 1. Bronchial –Hyperresponsiveness
 2. inflammatory reaction within the bronchial wall.





PATHOPHYSIOLOGY CONT.

- ROLE OF ALLERGENS:

- Inspired air

House dust, animal

Dander ,fungal spores



- Ingestion

Allergens in wheat,

fish, egg, milk



Allergens enter the body

CONT...



PATHOPHYSIOLOGY



- Previous exposure to the allergens



Stimulated the formation of IgE



Subsequent exposure result in anaphylactic, antigen, antibody reaction in the bronchi



PATHOPHYSIOLOGY



Release of pharmacologically active mediators
from cells in bronchial tissue



Bronchial constriction & inflammatory reaction



signs and symptoms



- **CELLS INVOLVED IN THE RELEASE OF MEDIATORS:**

1. Mast cells
2. Macrophages
3. Eosinophils
4. Lymphocytes
5. Basophils



PATHOPHYSIOLOGY .CONT.

- **MEDIATORS OF BRONCHIAL HYPERRESPONSIVENESS, INFLAMMATION:**

Histamine

Prostaglandins

Thromboxane

Leukotrienes

Platelet activating factors

Bradykinin



CLINICAL SYMPTOMS



- **EPISODIC ASTHMA:**
 - ❖ Occurs as episodes with asymptomatic
 - ❖ Characterized by paroxysms of wheeze and dyspnoea with relatively sudden onset.
 - ❖ Episodes may be spontaneous in onset or triggered by allergens, exercise, viral infections
 - ❖ Attacks may be mild, or severe,
 - ❖ Last for hours, days, even weeks.



CLINICAL SYMPTOMS



- **SEVERE ACUTE ASTHMA:**
 - ❖ It's a chronic airway obstruction and asthmatic symptoms persist despite initial administration of acute asthma treatment.
 - ❖ Severe dyspnoea and unproductive cough
 - ❖ Patient adopt an upright position
 - ❖ Uses accessory muscles of respiration
 - ❖ Sweating, central cyanosis, tachycardia.



CLINICAL SYMPTOMS



❖ CHRONIC ASTHMA:

- ❖ Symptoms are usually chronic
- ❖ Chest tightness, wheeze, breathlessness on exertion will occur.
- ❖ Episodes of spontaneous cough, wheeze occur during night
- ❖ Repeated attacks of severe asthma is common
- ❖ Chronic cough, with mucoid sputum.



CLINICAL SYMPTOMS



- **PHYSICAL SIGNS IN THE CHEST:**
- Respiratory rate is increased with use of accessory muscles
- Hyper resonant- percussion(deep, low pitched)
- Breath sounds are vesicular in character with prolonged respiration.
- High pitched expiratory and inspiratory rhonchi are audible.(Coarse rattling sound)



CLASSIFICATION OF ASTHMA SEVERITY

- GLOBAL INITIATIVE FOR ASTHMA(GINA)
- MILD INTERMITTENT ASTHMA:

Asthma symptoms twice a week or less. Night symptoms twice amounts or less.

- MILD PERSISTENT:

Asthma symptoms more than twice a week. But not more than one day. Symptoms at night more than twice a month .Asthma attack affect activity.



- **MODERATE PERSISTENT:**

Asthma symptoms are present every day , night time symptoms more than once a week, may affect activity.

SEVERE PERSISTENT:

Symptoms throughout the day on most days, night time symptoms often, physical activity likely limited.



INVESTIGATIONS



- HISTORY
- Physical Examination
- Chest X-ray

In acute attack- attack-hyperinflated lungs

In between attack- lungs look normal



INVESTIGATIONS

- pigeon chest,
- lobar , segmental collapse,
- Pneumothorax



Left upper lobe collapse – PA view



- Loss of volume on left side
- Ipsilateral shift of trachea and mediastinum
- Compensatory hyperinflation of left lung
- Raised left hemidiaphragm (compare with right) with tenting
- Haziness over the aortic knuckle (silhouette sign)

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INVESTIGATIONS



- Pulmonary function test:
- Forced expiratory volume in one second(FEV1)
- Vital capacity
- Peak expiratory flow rate



INVESTIGATIONS

- **ARTERIAL BLOOD GAS ANALYSIS:**
Shows hypoxia, Hypocarbia
In severe asthma, hypercarbia develops



INVESTIGATIONS



- Sputum and blood eosinophilia
- Elevated serum IgE levels



MANAGEMENT

- **AVOIDANCE OF ALLERGENS:**

In case where single allergen is found responsible , its easy to reduce or avoid the exposure.

Multiple allergens, avoidance becomes difficult.



MANAGEMENT

- Drugs in asthma can be grouped into seven major categories:
 1. Beta adreno receptor agonist
 2. Methylxanthines
 3. Corticosteroids
 4. Chromones
 5. Anticholinergics
 6. Leucotrine inhibitors
 7. Miscellaneous



SALBUTAMOL, LEVOSALBUTAMOL, TERBUTALINE:

These are short acting bronchodilators, which act by relaxing the bronchial smooth muscles.

They are active by all routes of administration

Most preferred route is inhalation.

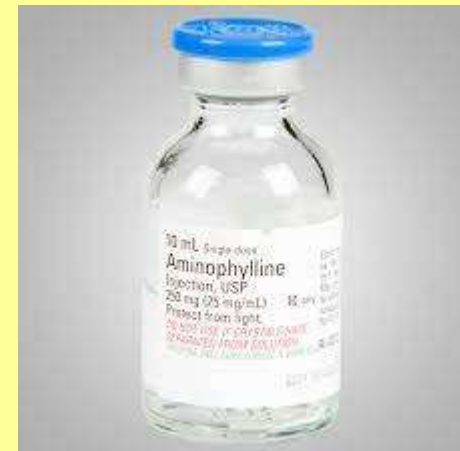


- METHYLXANTHINES:

THEOPHYLINE -100-200 mg tid,300 mg
bd,450-600 mg od

AMINOPHYLINE -5 mg/kg body weight, IV

DOXOPHYLINE -400 mg bd





- **CORTICOSTEROIDS:**

not bronchodilators, but prevent airflow obstruction.

-Hydrocortisone :4 mg/kg IV

Methylprednisolone : 40-125 mg every 6 hours

Prednisolone: 40-60 mg orally.



- **CHROMONES:**

Cromolyn sodium

It inhibits the degranulation of mast cells, thereby preventing mediators release.



- ANTICHOLINERGICS:

IPRATROPIUM ,TIOTROPIUM

Used in pts with co-existent heart disease, xanthines and beta adrenoreceptors agonist produce tachycardia.





- MISCELLANEOUS:

OMALIZUMAB

Useful in patients with allergic asthma.



- **LEUCOTRINES:**

Useful for patients who need high dose of steroids.

Montelukast 10 mg



REFERENCE

- Medicine –Prep Manual For undergraduates
K.George Mathew/Elsievier Publicatio
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publications



THANKYOU