



Bronchial Asthma presentation

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Bronchial asthma

- Asthma is a chronic inflammatory disorder of the conducting airways, usually caused by an immunologic reaction, which is marked by episodic bronchoconstriction due to increased airway sensitivity to a various stimuli; and increased mucou production.



Bronchial Asthma

A blue stethoscope is positioned in the top right corner of the slide, partially overlapping the dark blue header.

#OVERVIEW;

- 1) Chronic inflammation of airways
- 2) Increased reaction of Tracheobronchial tree to different allergen.

Bronchial Asthma



- Generalized airway obstruction
- Clinically
 - Dyspnea, cough & wheezing
 - Few minute to hours
 - Days (status asthmaticus)

Prevalence and etiology

- 4-5% USA
- Africa, USA and Spain
- All ages, more in childhood
 - 50% >10 years
 - 1/3 >40years
 - Male/Female ratio 2:1 in childhood
 - 30 year the ratio is equal



Continue

- Heterogeneous disease
 - Atopic
 - Genetic & environmental like virus
 - Allergen
 - Occupational





- Allergic asthma (Atopy)
 - History of familial or personal allergy
 - Positive skin reaction
 - Increased IgE in serum

- Idiosyncratic asthma (non atopic)
 - No familial history
 - IgE is negative
 - Negative skin tests

Asthma triggers

- Allergen
- Pharmacologic
- Environmental and air pollution
- Occupational
- Infection
- Sport & exercise
- Emotional stress



Allergen

- It is due to IgE reaction which is controlled with T& B lymphocytes.
- 25-35%
- 1/3 supportive rule
- Allergic asthma is belong to season
- Non seasonal is due to:
 - Animal danders, dust, etc



Cont..

- After inhalation of allergens →
- cross reaction of antigen & antibody on mast cells →
- excretion of hypersensitivity mediators



Pharmacologic

- Aspirin
- Tartrazin
- β -adrenergic antagonists
 - Timolol eye drop



Cont..



– Aspirin & other NSAID

- Vasomotor rhinitis
- Hyperplasticrhinosinusitis & nasal polyp
- Bronchial asthma

- Eye & nasal congestion and acute attack of asthma

- Acetaminophen, Sodiuimsalicylate, Cholinesalicylate, Salicylamide & Propoxyphene well tolerated.

Cont..

- Food
- Detergent and protective:
 - Sodium & potassium bisulfate,
 - Sulferdioxide
 - Potassium metabisulfite
 - Sodium sulfate



Environment and Air Pollution



- Air pollution
 - Ozone
 - Nitrogendioxide
 - Sulfur dioxide
- Atmospheric antigen
- Prophylaxis treatment with anti inflammatory drugs

Occupational Factors



- Several substances found in the workplace may causes acute or chronic airway obstruction.
- Heavy molecular
 - Dust, wood, plants, medicine (antibiotics, peprazin, cimitidin, biologic enzymes, animal secretion)



- Low molecular
 - Inorganic salts (Chrome, Nickel, platinum)
 - Chemical & industrial substances
 - Plastics (Toluene diisocyanate, Persulfates, Phatalic acid anhydrase & ethylinediamine)
 - Farmaldehyde & Ureaforaldehyde

Infections

A blue stethoscope is positioned in the top right corner of the slide, partially overlapping the dark blue background.

- The most common is Resp. Virus
- Child – adults:
 - Res. Scyntial virus, parainfluenza
- Adults:
 - Influenza, Rhinovirus
 - Mechanism not clear but:
 - Cytokine Production of T cell

Sport & Exercise

- Causes
- acute attack of asthma
- No long term effect & bronchospasm
- Run/walking
- Cold weather
- Mechanism:
 - Hyperemia & vascular leakage of respiratory system during exercise



Emotional stress

- Worse/better
- Psychological effect is not clear
- Different from one pts to other
- From one attack to other



Pathology



- Necropsy:
 - Over distended & non collapsing lung
 - Plugs, exudates in bronches & bronchiols
 - Histologic exam:
 - Hyperplasia of vascular and submucosal
 - Mucosal edema, basement membran thickness
 - Esonophils

Pathophysiology



- Airway narrowing due to:
 - Smooth muscle contraction
 - Vascular congestion
 - Bronchus edema
 - Thick secretion
 - \uparrow airway resistance
 - \downarrow force expiratory volume and PEFV
 - Hyper inflate lung and chest
 - Changes in respiratory muscle, ventilation, circulation and gas saturation



- FEV1 < 40% normal
- RV 400%
- Hypoxia is present in acute exacerbation, but Respiratory failure is present 10-15%

- Normal PCO₂:
 - is occur with sever resp. obstruction,
 - Sign for Respiratory failure
- Metabolic acidosis is occur latter

Clinical finding

- Dyspnea, cough & wheezing
- Typically attack start:
 - Chest tightness with dry cough
 - Harsh respiration
 - wheezing with respiration
 - Prolonged expiration period



Cont..

- Tachycardia
- Tachypnea
- Moderate HTN
- Overinflated lung
- paradoxical pulse
- Increased AP diameter of the chest
- Use of resp. accessory muscles
- Wheezing is not the end of attack



Conti..

- The end of attack is specified by:
- productive cough Curschmann's spiralis:
- (Charcot-Leyden crystal and Eosinophil)

- In sever cases
 - Wheezing is decreased or absent, gasping type respiration,
 - Muroid plug aggregation & suffocation



Continue

- Need for mechanical ventilation
- Some time:
 - Atelectasis due to thick secretion
- Rarely
 - Spontaneous pneumothorax
 - Pneumo mediastinum



Chest-X-Ray

- Early stage
- Late stage or sever
 - Hyper-inflation
- Sever case
 - pneumothorax



DDx:

- Dyspnea, wheeze
- Periodic attack
- History of allergy
 - Eczema, Rhinitis & Urticaria
- Night wakeness
 - with dyspnea & wheezing
 - Without those phenomena Dx of asthma is not reliable.



Cont..

- Upper airway obstruction due to Tumor and laryngeal edema
 - Stridor, harsh breathing sounds in larynx
 - No generalized wheezing in both lungs
 - If Dx is difficult
 - Bronchoscopy & Laryngoscopy



cont

- Functional glott dysfunction
 - Narrowing of glott in inspi/expir
 - Cause periodic sever attack of airway obstruction
 - PO_2 is normal
 - Normal physical finding during attack



Cont..

- Local & continuous wheezing in chest with cough
 - Foreign body aspiration
 - Neoplasm or
 - Bronchial stenosis



Cont..

- Acute left ventricular failure
 - Basal rals
 - Gallop rhythm
 - Cough with bloody sputum



Conti.

- Recurrent bronchospasm
 - Carcinoid tumors
 - Recurrent pul. Emboli & chronic bronchitis
- Eosinophilic pneumonia
- Pneumonia due to chemical
- insecticide &
- Cholinergic drugs



Dx

- Reversible airway obstruction
- Reversibility >15% in FEV1 after 2puff of β -adrenergic agonist
- If spirometry is normal
 - Histamin, methicholin or hyperventilation
 - Positive skin reaction
 - Esonophilia in blood and sputum
 - IgE evaluation in serum
 - Chest-X-Ray is not specific



Complications



- Dehydration, Respiratory infection
- CPC, Tussive syncope
- Sever cases (Resp. failure)
- Spontaneous pneumothorax
- Mediastinum emphysema
- Sever reaction → death
 - Drugs (penicillin, Aspirin, Indomethacin & Radiopaque)

Treatment

- Allergic asthma
 - Isolation of causative ingredient
 - Desensitization



Cont..

- Quick relief medications
 - β -adrenergic agonist
 - methylxanthines
 - Anticholinergics



Cont..

- Long term control medications
 - Glucocorticoid
 - long acting β_2 - agonist &
 - Combined,
 - Leukotriene modifiers &
 - Methylxanthines



Quick relief medications



- **β -adrenergic agonist:**

- Catecholamins
- Resorcinols
- Saligenins
 - Causes stimulation of β -adrenergic \rightarrow activate G-Proteins \rightarrow Cyclic adenosine monophosphate \rightarrow airway dilatation
 - \downarrow mediator secretion & \uparrow mucus clearance

Quick relief medications



- Catecholamine
 - Isoproterenol, Epinephrine & Isoetharine
 - 30-90 min IV/Inhalation

- Resorcinol: (Fenoterol, Terbutaline)
- Saligenin: (Albuterol)

- Resorcinol & Saligenin no effect on heart

Cont...



- Side effect:
 - Tremor
- Half life (4-6)hour
- Better to use inhalation
- Long acting agent:
 - Salmeterol & Formeterol (9-12) hour
 - Not for acute exacerbation

Methylxanthine

- Theophyllin 5-15 μ g/mL
- Second line drug
 - Clearenc \downarrow :
 - Old age, Erythromycin and other macrlid, Quinolone, Troleadomycin, Allopurinol, Cimetidine & Propranolol
 - Clearenc \uparrow :
 - smooking, Marijuana, Phenobarbital, Phenytoin



Cont..

- Complication:
- anorexia
- nausea & vomiting
- headach
- nervousness
- 30 μ g/mL cause cardiac arrhythmia



Anticholinergic



- Ipratropium bromide
 - Use in concomitant cardiac patient
 - Slow effect
 - 60-90 min for bronchodilatation
 - Moderate bronchodilatation

Glucocorticoids

- The most effective anti inflammatory drug
- In acute patient when bronchodilator is not effective
- Failure to other treatment &
- Recurrent exacerbation



Cont..

- Inhalation Glucocorticoid for long term control
- **Glucocorticoids are not bronchodilator**
- Methylprednisolone 120-180mg /6 hour IV
- Prednisolone 60mg/ 6hour oral



Cont..

- Because it effect after 6 hour, so it should be used together with bronchodilators.
- **Dose:**
 - After 3-5 days tapering start & continue for 10-12 days
 - Continuously alternating day
 - Dexamethason is not used for long term treatment



Inhaled glucocorticoid

- Continuously symptomatic
 - Control of inflammation
 - Long term prophylaxis
 - ↓ need of systemic steroid
 - ↓ risk of hospitalization
 - ↓ attack of asthma





–Dose

- Not clear, individual
- Need one week for clinical response, so not effective in acute stages.
- In sever cases double the dose

Complication of inhaled steroids



- Oral candidiasis
- Dysphonia
- High doses causes
 - Adrenal suppression
 - Cataract
 - Delay growth in children
 - Bone metabolic changes
 - Purpura

Drug combination

- Steroid + long acting β_2 -agonist
 - Mild & Moderate patient
 - Better effect / alone



Mast cell-stabilizing agent

- Cromolyn sodium
- Nedocromil sodium
- Use in atopic asthma
 - Recovery of lung function
 - ↓ symptoms
 - ↓ airway reaction



Cont..

- Rather than steroid when use for prophylaxis
 - Prevent acute attack when face to antigen, cold wheather, exercise & chemical substance



Leukotrin modifiers

- New drug for long term prophylaxis
 - Chemical mediators & cause asthma symptoms
 - Smooth muscle contraction
 - ↑ vascular permeability
 - ↑ mucus production
 - Activate inflammatory cells of Resp. system



Cont..

– Mild persistent asthma

- Zafirlukast 20mg BID P/O
- Zileuton 600mg QIDP/O
- Montelukast 10mg OD P/O



Desensitization

- Typical allergic asthma
- Miscellaneous agents
 - Immunosuppressant agent
 - Methotrexate, Colchicin & gold salts





– Acute sever asthma

- Opiate, Sedative & Tranquilizer should be avoided
- β -adrenergic blocker & Parasympathetic agonist is contra indicated
- Expectorant & Mucolytic not effective
- Magnesium sulfata is not clear

Special instruction

- Asthma with cardiac disease or pregnancy
 - β_2 selective
 - Low dose



Exacerbation of asthma



- Mild exacerbation:
 - Inhaled β_2 adrenergic
 - 3-4 hour/ 24-48
 - Inhaled steroid double
 - If didn't use should be started
 - If not effective
 - Course of Oral corticosteroid

Continue

- Moderate-Sever exacerbation:

- O₂ therapy 1-3lit/min

- Inhaled β_2 agonist

- Metoproterenol 5%-5ml 2ml
- Albuterol 0.5%-5ml 2ml



Cont..

- If not effective in 30min systemic corticosteroid
- Methyl Prednisolone succinate 0.5mg/kg/6hour IV
- Hydrocortisone 4mg/kg/6hour/ IV
- Anxiolytic & Hypnotic are contra indicated



Indication for hospitalization



- Unresponsive to treatment
- PEFR < 30-40% or < 200ml
- Respiratory acidosis
- ECG abnormality
 - Supraventricular arrhythmia
 - conduction defect &
 - ventricular ectopy

Cont...

- Pneumothorax
- Pneumomediastinum
- Respiratory failure
- Respiratory infection



Status asthmaticus

- Continual & sever asthma which is not responsive to the treatment.
- Treatment is the same as acute sever asthma
- Role of Aminophylline is not clear
- IV fluid for correction of hydration



Cont..

- If respiratory acidosis occur:
 - Intubation &
 - mechanical ventilation
 - If not effective:
 - Sedation
 - Segmental bronchial lavage

