BRONCHIAL ASTHMA

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OBJECTIVES:

- To give an introduction about asthma.
- Signs & symptoms.
- How to diagnose it?.
- Bases of treatment.
- Types of treatments.
- Ways of prevention.
Definition:

Asthma is a chronic condition involving the respiratory system in which the airways occasionally constricts, becomes inflamed, and is lined with excessive amounts of mucus, often in response to one or more triggers.
Triggers:

- Tobacco smoke.
- Infections such as colds, flu, or pneumonia.
- Allergens such as food, pollen, mold, dust mites, and pet dander.
- Exercise.
- Air pollution and toxins.
- Weather, especially extreme changes in temperature.
- Drugs (such as aspirin, NSAID, and beta-blockers).
- Food additives (such as MSG).
- Emotional stress and anxiety.
- Singing, laughing, or crying.
- Smoking, perfumes, or sprays.
- Acid reflux.
Signs & Symptoms:

- **Shortness of breath**.
- **Tightness of chest**.
- **Excessive coughing or a cough that keeps you awake at night**.
- **Feeling very tired or weak when exercising**.
- **Wheezing or coughing after exercise**.
- **Decreases or changes in lung function as measured on a peak flow meter**.
- **Signs of a cold, or allergies** (sneezing, runny nose, cough, nasal congestion, sore throat, and headache).
- **Trouble sleeping**.
Diagnosis:

- History of the patient & clinical examination.
- Devices to improve the finding of asthma like:
  - **Spirometer (Pulmonary Function Test)**
  - **Peak flow rate** (measured in rest & in exercise)
    - Patient may have only (exercise-induced asthma)
Investigation:

- Routine Blood Investigation
- Chest X-ray
- Sputum examination
- Arterial Blood Gas analysis
- **Capnography** (measures the amount of exhaled CO₂)
- **Pulse oximetry** (shows the amounts of O₂ dissolved in blood.)
Spirometry

- Spirometry Pre & Post use of Broncho-dilator MDI
- To establish reversibility of airflow obstruction
  - $> 12\%$ reversibility or
  - Increase in FEV$_1$ of 200cc is considered significant
- Obstructive pattern:
  - Reduced FEV$_1$/FVC ratio
- Restrictive pattern:
  - Reduced Both FEV$_1$ & FVC; Normal FEV$_1$/FVC ratio
Pulmonary function test (Spirometer):

TV = Tidal volume (500 ml)
IRV = Inspiratory reserve volume (3,000 ml)
IC = Inspiratory capacity (3,500 ml)
ERV = Expiratory reserve volume (1,000 ml)
RV = Residual volume (1,200 ml)
FRC = Functional residual capacity (2,200 ml)
VC = Vital capacity (4,500 ml)
TLC = Total lung capacity (5,700 ml)
Because of the bronchoconstriction specially during Expiration ERV decreased.

NOTE: FEV1/VC% := FEV1% = % of total VC expired in 1st second = Less than 80% in asthma.
Differential Diagnosis

- Pulmonary edema
- Chronic Obstructive Lung Disease (COPD)
- Congestive Cardiac Failure (CCF)
- Pneumothorex
- Bronchopneumonia
**Treatment:**

- **Bases of treatments:**
  - *one way is to relaxes the muscles during expiration.*
Drugs used in treatment:

- **Oxygen inhalation**
- **Anti-inflammatories**
  - Specially leukotriene inhibitors = Sodium Cromoglycate
- **Bronchodilators**
  - **Corticosteroids.**
    - Hydrocortisone, Beclomethasone, Prednisolone
  - **Beta agonist**
    - Salbutamol, Terbutaline, Adrenaline
  - **Anti-cholinergic**
    - Ipratropium bromide
  - **Phosphodiesterase inhibitor**
    - Aminophylline, Deriphylline
Treatment

- Mast cell stabilizers
- Leukotriene receptor antagonists
- Antibiotic
- Respiratory Support – BIPAP
- ABG analysis and correction
Metered Dose Inhaler (MDI)

- Device that delivers a specific amount of medication to the **lungs**
- in the form of a short burst of aerosolized
- inhaled by the patient
Metered Dose Inhaler (MDI)
Spacer
Nebilization
BIPAP or CPAP
Prevention:

- One method of prevention is to form at least yearly medical exam specially for the major systems.
- Today, some drugs are used to prevent it:
  - **Corticosteroids.**
  - **Glucocorticoids (Cortisone) because we said that cortisol has a permissive action to catecholeamine which induces VC & BD.**
  - **Anti- inflammatory drugs** (specially anti-histamine).
THANK YOU FOR LISTENING