

## Medicine – Dr. Kawa – Lecture 2 - Clinical Manifestations of Asthma

The classic symptoms of asthma are **wheezing** , **cough** & **shortness of breath( with chest tightness )**.

During periods of relatively normal lung function , patients are likely to have no physical findings

### **Wheezing:**

Wheezing is the most common finding during acute airway obstruction, & the chest may be hyperresonant on percussion.

### **Cough:**

The cough can be nonproductive or raise copious amounts of sputum ( particularly in the presence of infection )

Eosinophils & their debris may cause a yellow discoloration of sputum , even when infection is absent

Occasionally , cough is the only manifestation of asthma.

### **Shortness of breath:**

Dyspnea tends to vary greatly over time , depending on the severity of airflow obstruction.

### **Chest tightness :**

commonly occurs with dyspnea & may be confused with angina pectoris .

Most patients associate their chest tightness with the sensation of being unable to take in a full & satisfying breath .

### **Physical signs of asthma : (in the chest)**

- During an attack the chest is held near position of full inspiration & percussion note may be **hyperresonant**.
- Breath sound are **vesicular with prolong expiratory phase**.
- Bilateral expiratory & may be inspiratory **ronchi**.
- In very severe asthma the chest may be **silent**, because of insufficient air flow.
- No physical signs between attack except in patients with chronic asthma which there is usually expiratory rhonchi
- Severe asthma starting from childhood may cause **pigeon** chest deformity (pectus carinatum)

### **According to the clinical features we can divide asthma into the following:**

- 1- Episodic asthma (usually atopic).
- 2- Chronic asthma (non atopic).
- 3- Acute severe asthma (status asthmaticus).
  - History of allergy is very important.

- An extremely common feature of asthma is nocturnal awakening with dyspnea & wheezing .

**Episodic asthma (atopic):**

*No respiratory symptoms between episodes.*

*Paroxysms of dyspnoea & wheeze may occur at any time, may be sudden onset.*

*Paroxysms may last hours, days or weeks, may be mild, moderate or severe.*

*Triggers are : allergens, cold, exercise & respiratory infections (specially viral).*

**Chronic asthma (non atopic) :**

*symptoms are: wheeze , cough , dyspnoea & chest tightness.*

*cough & wheeze at night (an extremely common feature of asthma is nocturnal awakening with dyspnoea and/ or wheezing).*

*Episodes of sever acute asthma.*

*Recurrent episodes of chest infection with productive cough are common*

*(It may be difficult to differentiate from chronic bronchitis).*

**Acute sever asthma (status asthmaticus)**

*This is a life- threatening attack of asthma .*

*-patients are usually extremely distressed, usually adopts an upright position, fixing his shoulder girdle to assist the accessory muscle of respiration .*

*-The patient usually have dyspnoea,tachypnoea ,wheeze , dry cough, sweating ,tachycardia & pulses paradoxes (a large fall in blood pressure during inspiration & the pulse may be impalpable due to reduced cardiac return as a consequence of sever hyperinflation).*

*-In sever cases: central cyanosis, silent chest (no wheeze) & bradycardia may occur.*

**Triggers of asthma (not causes) :**

**1- Exposure to allergens:** *such as home dust, fungal spores, gases , fumes or wood dusts.*

**2- Cold exposure** *(cold air).*

**3- Exercise.**

**4- Smoking:**

*-Smoking during pregnancy increases the risk of developing atopic asthma in infancy.*

*-Passive exposure to cigarettes smoke immediately following birth increase the risk of developing asthma.*

**5- drugs:** *B- blockers (even when used topically or eye drops), aspirin (and other NSAID)*

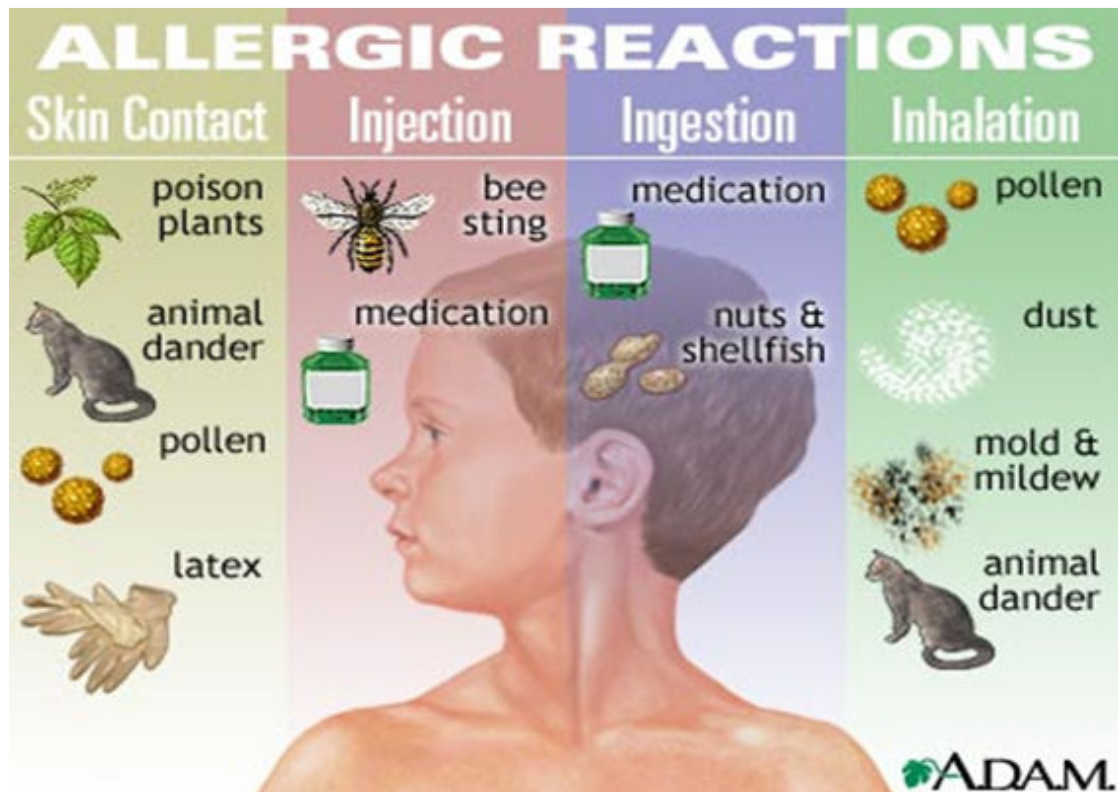
*about 10% of asthmatic patients develop bronchospasm when given aspirin.*

**6- Infection:** *viral & bacterial infection of respiratory tract (viral more than bacterial).*

**7- Anxiety & psychological factors:**

Sever anxiety or stress can exacerbate asthma.

## ALLERGENS



### Investigation in asthma

- 1/ CXR.
- 2/ pulmonary function test.
- 3/ skin hypersensitivity tests.
- 4/ measurement of allergic status .
- 5/ blood gases

#### 1- Chest X- ray

**Normal** between attacks.

During an attack looks **hyperinflated**.

In chronic cases looks similar to the hyperinflation caused by emphysema.

In chronic cases a lateral view may show **pigeon** chest deformity.

There may be segmental or lobar **collapse** due to obstruction of a large bronchus by thick mucus (mucus plug).

**Pneumothorax:** a rare but may be fatal complication of asthma.

Rarely in sever cases CXR may show mediastinal or subcutaneous emphysema.

#### 2- Pulmonary function tests

FEV/VC <70%

FEV, VC and PEF all are reduced, they should be recorded for diagnosis & follow up .

PEF rate should be recorded twice daily to all patients admitted to hospital by a peak flow meter & a chart arranged which will show marked diurnal variation.

The lowest values recorded in the morning & called (morning dipping).

**Morning dipping** : PEF over night fall (morning dipping) & subsequent rise during the day in patients with asthma.

#### **Reversibility test :**

in asthma usually there is an improvement in FEV1 or PEF following administration of a bronchodilator .

Reversibility test is defined as a 15% or more increase in FEV1 20 min. after inhalation of a  $\beta$ -agonist

#### **Measurement of bronchial reactivity :**

can be of value in diagnosing asthma & in assessing the effects of treatment

this can be achieved by administering increasing concentration of substances such as **histamine** by inhalation until there is a 20% fall in FEV1, or PEF.

Patients with asthma show evidence of broncho-constriction as much lower concentrations than normal subjects.

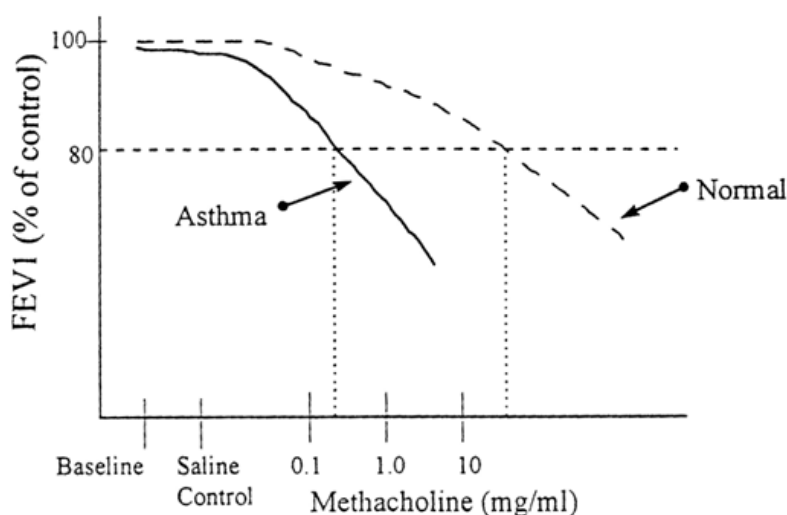


Figure 1. Example of methacholine challenge test. Baseline spirometry (measuring FEV1) is performed. This is then repeated after the patient breathes nebulized normal saline. The patient with asthma demonstrates a 20% fall in FEV1 at a relatively low dose of methacholine. In contrast, normals only experience a significant fall after much higher doses.

#### **3- Skin hypersensitivity test :**

By **intradermal injection** of common allergens to differentiate atopic from non-atopic .

In atopic there is positive skin test .

#### **4- Measurement of allergic status :**

1- elevated sputum &/or peripheral blood **oesinophil** .

2- elevated serum **IgE** level.

3- skin test (simple & provide rapid assessment of atopy).

### **DIAGNOSIS OF ALLERGIC CONDITION**

### **5- Blood gases :**

*PaO<sub>2</sub> is diminished .*

*PaCO<sub>2</sub> is normal or diminished due to hyperventillation .*

## **Making a diagnosis of asthma**

*History & Examination + Pulmonary function test ( including Reversibility test ).*

### **Diagnosis of bronchial asthma**

#### **Techniques to establish diagnosis**

- History

Physical exam (resp. tract, skin, chest)

Pulmonary function test (Spirometry to demonstrate reversibility)

Additional studies :

    evaluate alternative dx., ID precipitating factors

    assess severity, ID potential complications

### **Diagnosing Asthma (history & examination)**

Troublesome cough, particularly at night

Awakened by coughing

Coughing or wheezing after physical activity

Breathing problems during particular seasons

Coughing, wheezing, or chest tightness after allergen exposure

Colds that last more than 10 days

Relief when medication is used

Increased nasal secretions or nasal polyps

Atopic dermatitis, eczema, or other allergic skin conditions

Wheezing sounds during normal breathing

Hyperexpansion of the thorax

Vesicular breath sound with prolong expiratory phase , with diffuse rhonchi