

Asthma:

- What is asthma?

A chronic inflammation in the airways making it narrower.

- How does it occur? Pathophysiology?

- In the bronchioles, you have mucus; mucosa which includes the inner lining of epithelial cells and lamina propria; And submucosa which has the smooth muscles.

- There are lots of eosinophils under the epithelial cells in the lamina propria.

Eosinophils are a cargo full of granules which have soluble chemical mediators like:

(i) Leukotrienes

(ii) Histamine

(iii) Prostaglandin

(iv) Platelet activating factor.

- When these eosinophils sense an environmental trigger such as cigarette smoke in the airways, they can release their granules and start degrading lipids, proteins and nucleic acids and all other cellular components.

- This creates a strong inflammatory rxn in the bronchial wall and causes two changes:

(i) The smooth muscles around the bronchioles start to spasm which narrows the airways

(ii) Increased mucous secretion into those narrow airways, making it more narrow.

- these inflammatory changes are completely reversible initially. But over years, irreversible changes start to take place.

Edema, scarring and Fibrosis build-up leading to thickening of Epithelial basement membrane which permanently reduces the airway diameter.

- What causes asthma? Etiology?

- The specific causes of asthma are unknown
- It is believed to be a combination of genetic as well as environmental factors.

Genetic factors -

- certain genes are identified causing asthma
- Family history.

Environmental factors -

(i) Air pollution: (ii) Allergens:

- Cigarette smoke
- Dust particles
- Car exhaust
- Insects
- Moulds

(iii) Medications: - Pet dander

- Aspirin
- Beta-blockers

- What are its symptoms?

- Coughing
- Chest tightness (rare)
- Dyspnea
- Wheezing

* Occasionally, in the sputum, there might be (rare) CURSCHMANN SPIRALS, which are spiral mucus from the small bronchi seen in people with bronchial asthma.

This can be dangerous as it can block medication.

- What is the treatment?

(i) Bronchodilators:

(a) β_2 -sympathomimetics -

salmeterol; salmeterol; Terbutaline; Formoterol.

(b) Methylxanthines -

Theophylline; Aminophylline; Hydroethyl theophylline.

(c) Anti-cholinergic -

Ipratropium bromide; Tiotropium bromide.

(ii) Leukotriene antagonists:

Montelukast; Zafirlukast

(iii) Mast cell stabilizers:

Sodium chromoglycate; Ketotifen

(iv) Corticosteroids:

(a) Systemic -

Hydrocortisone; Prednisolone and others

(b) Inhalational -

Becomethasone dipropionate