Bronchial Asthma

- **CLINICAL CASE**
- **A 38-year-old female presented with a worsening shortness of breath, chest tightness, and coughing, especially in the previous 2 weeks.**
- **She described itchy, watery eyes, congestion and runny nose when around cats and also in the spring and fall.**

Bronchial Asthma

- **Q.1 One of the following treatment options was prescribed to relieve her allergic condition:**

a.Atropine.

b.Oral aminophylline.

c.Aggressive therapy with oral steroids for 5 days.

d.Salbutamol.

Bronchial Asthma

- **Q.2 Your answer to the last question was based on that this drug will provide the patient with the following advantage:**

a.Its anti-inflammatory effect will dramatically relief her allergic conditions together with her bronchial asthma.

b.It provides effective bronchodilating activity.

c. It antagonizes the overactive parasympathetic tone

BRONCHIAL ASTHMA

By Dr. Rania A. Abdel-Emam

ANTI-ASTHMATIC DRUGS

- **Bronchodilators**
- β2-adrenergic agonists
- Anticholinergic drugs
- Methylxanthines
- **Antiinflammatory drugs** :
- Corticosteroids
- Cromolyn sodium
- Leukotriene antagonists
- Anti-IgE therapy

ANTI-INFLAMMATORY DRUGS

CORTICOSTEROIDS

Mechanism of action:

- **HOW DO THEY IMPROVE BRONCHIAL ASTHMA?**

- [**Potent anti-inflammatory drugs**] by inhibition of the formation of inflammatory mediators and suppression of acute and chronic inflammation in airways. This is achieved via:

1- **inhibition of phospholipase A_2** leading to inhibition of synthesis of inflammatory mediators from arachidonic acid.

2- **inhibition of COX_2** leading to inhibition of production of PGNs by inflammatory cells.

CORTICOSTEROIDS

3- **reduces the levels of circulating eosinophils, lymphocytes, basophils & monocytes** leading to decrease bronchial infiltration by chronic inflammatory cells.

4- **reduces the release of histamine** from mast cells leading to decrease capillary permeability, vasoconstriction and tissue edema.

- **Potentiate the bronchodilator action of the β_2 agonists.**

Uses of corticosteroids in treating bronchial asthma

According to the route of administration

• INHALATION

- **1st line prophylactic therapy**
- beclomethasone, triamcinolone, budesonide.
- ADRs:

1- Hoarseness of voice.

(due to direct effect on vocal cords)

2- Oropharyngeal candidiasis. (prevented by rinsing mouth and throat after each use)

SYSTEMICALLY

- **Acute exacerbations** (short course of **oral prednisone** for 5 days).
- **Status asthmaticus** (**I.V. methylprednisolone** every 6 hours until the attack subsides. Then continue on oral prednisone).
- **The dose is gradually tapered over 10-14 days.**

MAST CELL STABILIZERS

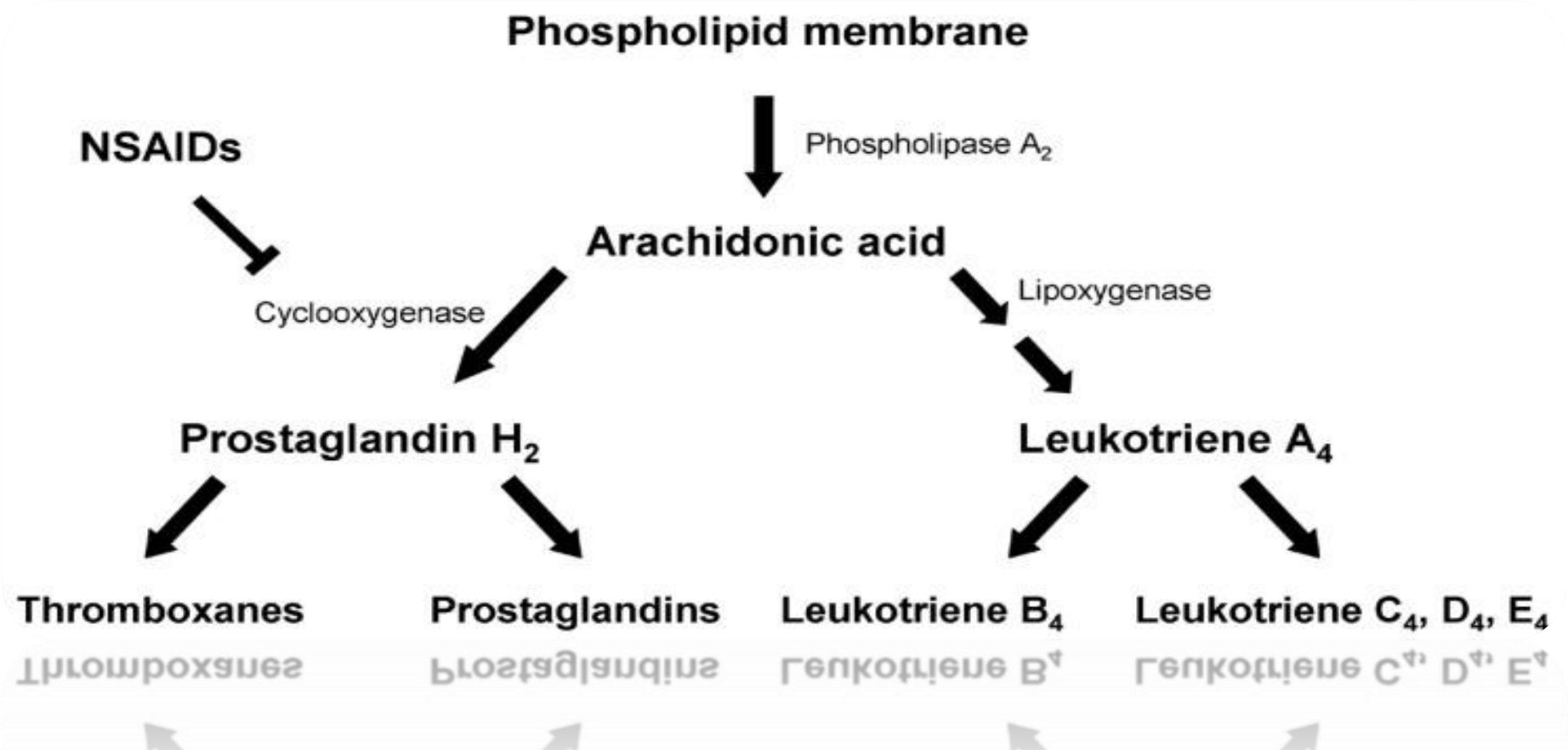
Cromolyn sodium and nedocromil

- Stabilization of mast cell on exposure to allergens preventing degranulation and release of histamine and broncho-constrictor chemical mediators.

- **They are not useful in managing an acute asthma attack but only as a prophylactic treatment.**
- Given by inhalation.
- Nedocromil more effective than cromolyn and approved for 12 years and older [cromolyn is approved for all ages]

Leukotriene antagonists

- Leukotrienes are biochemical mediators from arachidonic acid through the **5-lipoxygenase** pathway.



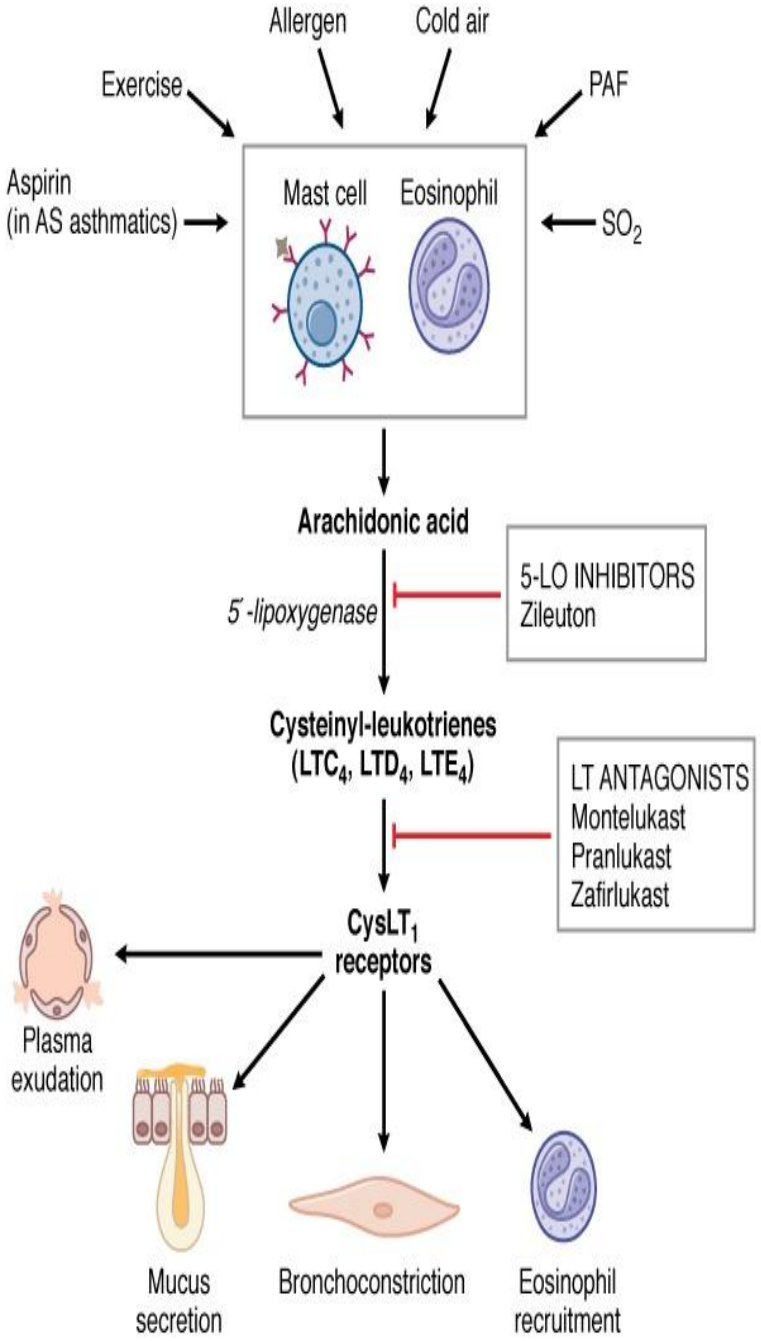
- **Zileuton**: (four times daily)

  It is 5-lipoxygenase inhibitor preventing formation of both LTB_4 and the cysteinyl leukotrienes (LTC_4, LTD_4, LTE_4). **HEPATOTOXICITY**

  ☙ (twice daily) ☙ (once daily)

- **Zafirlukast & Montelukast**:

  They are blockers of leukotriene receptors. Prophylactic ttt, **Aspirin induced asthma.**



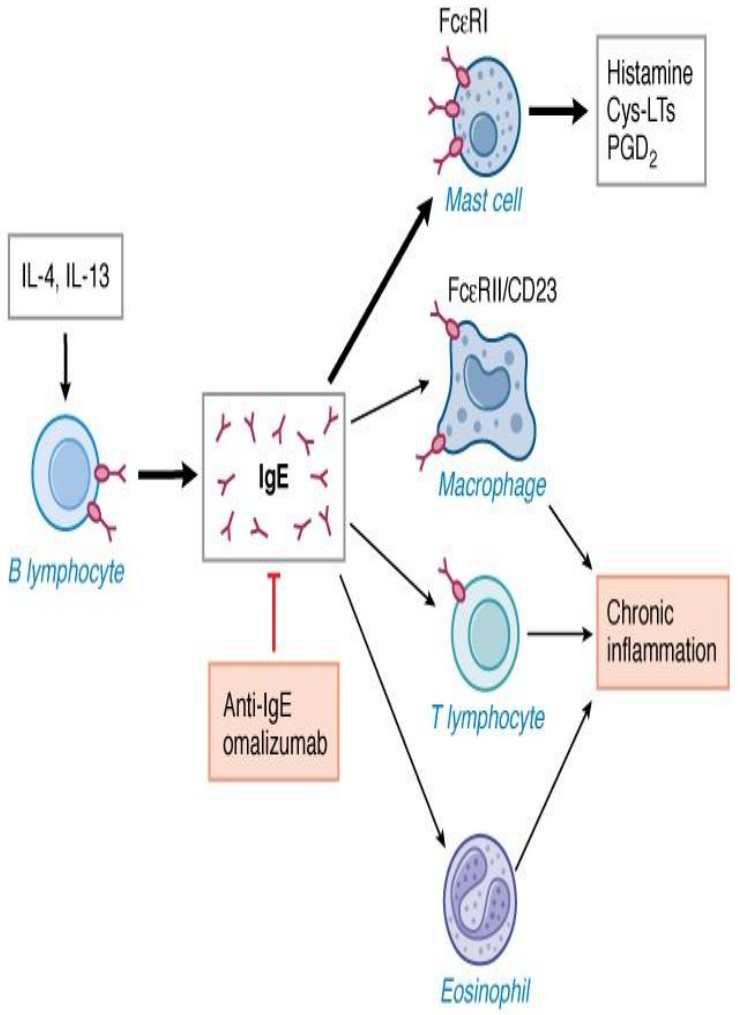
- Used as a Prophylactic treatment of mild asthma.

- They are of value as a prophylaxis against aspirin-induced asthma where aspirin inhibits cyclo-oxygenase pathway of arachidonic acid metabolism giving the upper hand to lipoxygenase activity which then will be suppressed by antileukotrienes.

Anti-IgE therapy
Omalizumab

- It is a recombinant monoclonal antibody targeted against free IgE (Anti-antibody).

- IgE bound to omalizumab cannot bind to IgE receptors on mast cells and basophils, preventing the allergic reaction at a very early step in the process.
- Used as a prophylactic treatment



MANAGEMENT OF ACUTE ASTHMA

Mild attacks

- Inhalation of a short acting β2 -agonist (salbutamol)

Moderate attacks

- Inhaled short acting β2 agonist continuously
- Early administration of systemic corticosteroids

Severe attacks and status asthmaticus

- Oxygen.
- β 2 agonist (salbutamol), Anticolinergics, Methylxanthines I.V.
- Corticosteroids I.V.
- Mechanical ventilation.

Long-term management

- Avoidance of exposure to triggering factors
- Treatment of upper respiratory tract infections (e.g Sinusitis).
- Anti-asthmatic drugs:
  - Long acting B2 agonists (inhaled)
  - Corticosteroids (inhaled)
  - Mast cell stabilizers
  - Leukotriene antagonists
  - Anti-IgE therapy
- Hyposensetization
- Psychotherapy & biofeedback

Bronchial Asthma

- **Q.3 ONE of the following treatment options was given to her as a maintenance treatment:**

a.Ipratropium.

b.Intravenous aminophylline.

c.Inhaled corticosteroid and long-acting beta agonist.

d.Inhaled salbutamol.

Bronchial Asthma

- **For avoidance of recurrence of the acute attack of bronchial asthma; one of the following drugs was properly administered:**

  A- Isoprenaline.

  B- Epinephrine.

  C- Cromolyn sodium.

  D- Ephedrine.

Bronchial Asthma

- **The drug you selected in the last question is administered through one of the following routes:**
- A- Subcutaneously.
- B- Intramuscularly.
- C- By inhalation.
- D- Orally.


THANK
YOU