DRUG TREATMENT OF BRONCHIAL ASTHMA

Asthma



Chronic Asthma

G Acute Severe Asthma (Status Asthmaticus)



CLASSIFICATION

1. Bronchodilators

- A. Sympathomimetics
- B. Methylxanthines
- C. Anticholinergics
- 2. Corticosteroids CONTROLLERS

RELIEVERS

- 3. Mast Cell Stabilizers
- 4. Leukotriene Receptors Inhibitors & 5- Lipoxygenase Antagonist
- 5. Targeted (Monoclonal Antibody) therapy



SYMPATHOMIMETIC DRUGS

Inhaled β₂ agonists -treatment of choice in asthma
➢ Most effective
➢ Minimal adverse effects

SYMPathomimetic agents Mechanism of Action in Asthma

1. Bronchodilation

Act on β_2 receptors in airway smooth muscles

Stimulate adenyl cyclase

R REDICAL UMPAT

↑ cAMP in airway tissue
↓
Relaxation of smooth muscle
Brochodilation

BETA 2 SELECTIVE DRUGS



- Albuterol (Salbutamol) Terbutaline Metaproterenol Pirbuterol
- Inhaled or oral
- Bronchodilation maximal within 15–30 minutes & persists for 3–4 hours

$\begin{array}{l} LONG-\&CTING\\ \beta_2-SELECTIVE \&GONISTS \end{array}$



Salmeterol (a partial agonist) Formoterol (a full agonist)

- Long duration of action (12 hours or more)
- No anti-inflammatory action not recommended as monotherapy for asthma
- Indacaterol, olodaterol, vilanterol (ultra long-acting)

ADVERSE EFFECTS OF BETA AGONISTS



- β₂ selective safe & effective bronchodilators when taken on an "as needed" basis for relief of symptoms,
- Risk of adverse effects from chronic treatment even with long-acting β agonists

TACHYCARDIATREMORSNERVOUSNESS

More with nonselective

METHYLXANTHINE DRUGS

Tea

- General Science Control S
- 🛯 Theobromine -
- Caffeine Coffee
- Aminophylline _
- Cocoa Coffee



A theophylline derivative

MECHANISM OF ACTION OF METHYLXANTHINES

1. Inhibit Phosphodiesterase (PDE)

PDE is enzyme responsible for breakdown of cAMP



PH&RM&COKINETICS-METYLX&NTHINES



Theophylline - most commonly used

- Water insoluble administered as salts
- Well absorbed
- ♦ Narrow therapeutic window, and its therapeutic and toxic effects are related to its blood level – MONITORING (> 40mg/L)
- Anorexia, nausea, vomiting, abdominal discomfort, headache, and anxiety, insomnia
- Metabolized by the liver

MUSCARINIC ANTAGONISTS



MECHANISM OF ACTION

 Competitively inhibit the effect of acetylcholine at muscarinic receptors

CORTICOSTEROIDS



Act by their broad anti-inflammatory effects
Mediated in part by inhibition of production of inflammatory cytokines
They DO NOT relax airway smooth muscle directly

General Reduce bronchial reactivity
Reduce the frequency of asthma exacerbations if taken regularly
Potentiation of the effects of β-receptor agonists**

CORTICOSTEROIDS



MECHANISM OF ACTION

- 𝛥 Inhibit the expression of COX-2
- **G** Reduce the synthesis of Phospholipase A2
- Sind to intracellular receptors and prevent the full expression of inflammation and allergy

ADVERSE EFFECTS (CORTICOSTEROIDS)



- Oropharyngeal candidiasis
- Risk reduced by having patients gargle water and spit after each inhaled treatment
- Hoarseness- direct local effect of inhaled corticosteroids on the vocal cords
- May increase the risks of osteoporosis & cataracts over the long term

MAST CELL STABILIZERS

CROMOLYN NEDOCROMIL



Low solubility - poorly absorbed from GIT
Inhibit both antigen and exercise-induced asthma

 NO effect on airway smooth muscle tone -INEFFECTIVE in reversing asthmatic bronchospasm
Of value when taken prophylactically



MECHANISM OF ACTION

Decrease in the release of mediators such as leukotrienes and histamine from mast cells **USES:**

1.Bronchoconstriction caused by allergen inhalation, by exercise, by sulfur dioxide, and by a variety of causes of occupational asthma

2.Reduce symptoms of allergic rhinoconjunctivitis3.Cromolyn given orally for food allergy

ADVERSE EFFECTS: cough and airway irritation

LEUKOTRIENE PATHWAY INHIBITORS



<u>Pharmacokinetics</u> ROA.....oral Children (montelukast – 12 m age)

LEUKOTRIENE PATHWAY INHIBITORS

<u>Clinical Uses</u>

- Asthmatic patients.....reduce frequency & exacerbationsAdd-on therapy
- •Aspirin-induced asthma

Adverse Effects

- •Hepatotoxicity.....LFTs monitoring
- Churg-Strauss syndrome
- •Allergic granulomatous angiitis

ANTI-IGE MONOCLONAL ANTIBODIES

