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PHARMACOLOGY - III

UNIT 1

TOPIC :

- **b. Drugs used in the management of COPD**



Drugs Used in the Management of COPD

COPD (Chronic Obstructive Pulmonary Disease) is a progressive lung disease characterized by:

- Persistent airflow limitation
- Chronic inflammation
- Includes:
 - Chronic bronchitis
 - Emphysema

Symptoms

- Dyspnea (shortness of breath)
- Chronic cough
- Sputum production

Treatment Goals

- Relieve symptoms
- Improve exercise tolerance
- Prevent disease progression
- Reduce exacerbations
- Improve quality of life

Classification of Drugs

A. Bronchodilators (Mainstay of therapy)

1. β_2 -agonists
2. Anticholinergics
3. Methylxanthines

B. Anti-inflammatory Agents

1. Corticosteroids
2. PDE-4 inhibitors

C. Other Drugs

- Antibiotics
- Mucolytics
- Oxygen therapy

A. Bronchodilators

β_2 -Adrenergic Agonists

Types

- **Short-acting (SABA):** Salbutamol, Terbutaline
- **Long-acting (LABA):** Salmeterol, Formoterol
- **Ultra-LABA:** Indacaterol

Mechanism of Action

- Stimulate β_2 receptors $\rightarrow$ $\uparrow$ cAMP $\rightarrow$ **bronchodilation**

Pharmacological Effects

- Relax airway smooth muscle
- Improve airflow
- Reduce dyspnea

Uses

- SABA $\rightarrow$ Acute symptom relief
- LABA $\rightarrow$ Maintenance therapy

Adverse Effects

- Tremors
- Tachycardia
- Hypokalemia

Anticholinergics

Examples

- **Short-acting (SAMA):** Ipratropium
- **Long-acting (LAMA):** Tiotropium, Glycopyrrolate

Mechanism

- Block M₃ receptors → inhibit vagal bronchoconstriction

Effects

- Strong bronchodilation
- Reduce mucus secretion

Uses

- First-line drugs in COPD
- Maintenance therapy

Adverse Effects

- Dry mouth
- Constipation
- Blurred vision

Methylxanthines

Examples

- Theophylline
- Aminophylline

Mechanism

- Inhibit phosphodiesterase → ↑ cAMP
- Bronchodilation

Uses

- Add-on therapy

Adverse Effects

- Nausea
- Insomnia
- Arrhythmias

B. Anti-inflammatory Drugs

Corticosteroids

Examples

- Inhaled: Budesonide, Fluticasone
- Oral: Prednisolone

Mechanism

- Suppress inflammatory response

Uses

- Moderate to severe COPD
- Frequent exacerbations

Note

- Less effective than in asthma

Adverse Effects

- Oral candidiasis
- Immunosuppression

PDE-4 Inhibitors

Example

- Roflumilast

Mechanism

- Inhibit phosphodiesterase-4 → ↓ inflammation

Uses

- Severe COPD with chronic bronchitis
- Frequent exacerbations

Adverse Effects

- Weight loss
- Nausea
- Insomnia

C. Other Drugs

Antibiotics

- Used during infections

Examples

- Amoxicillin
- Azithromycin

Mucolytics

- Acetylcysteine

Action

- Break mucus → easier expectoration

Oxygen Therapy

- For severe hypoxia
- Improves survival