DRUGS ACTING ON THE RESPIRATORY SYSTEM part II

Lec-7-

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3\Muscarinic An antagonists

- Muscarinic antagonists inhibit acetylcholine's effect at muscarinic receptors, blocking airway smooth muscle contraction and mucus secretion.
- Systemic adverse effects include urinary retention, tachycardia, loss of accommodation, and agitation.

• Ipratropium bromide, being poorly absorbed and not enter CNS, allows high dose delivery to muscarinic receptors in airways, making it safe for bronchial asthma.

• Antimuscranic antagonist drugs are less effective than β-agonists in reversing asthmatic bronchospasm.

• Ipratropium enhances bronchodilation in acute severe asthma.

• Antimuscarinic agents are valuable in chronic obstructive pulmonary diseases and as alternative therapies for patients intolerant of β-agonists.

4. ANTI-INFLAMMATORY AGENTS:

CORTICOSTEROIDS

Used both for treatment and prophylactic purposes

Mechanism of action

- Inhibits production of inflammatory mediators.
- Potentiates effects of β-receptor agonists.
- Inhibits lymphocytic-eosinophilic airway mucosal inflammation.

Effects on airway

- decreases bronchial reactivity
- increases airway caliber
- decreases frequency of asthma exacerbation and severity of symptoms

NOTE: The corticosteroids commonly used are hydrocortisone, predinisolone, beclomethasone, triamcinolone and etc.

Corticosteroids Administration

- Can be taken via aerosol, oral, or IV administration.
- Oral and parenteral are reserved for urgent treatment and unimproved patients.
- Aerosol treatment reduces systemic adverse effects.
- Discourage abrupt discontinuation due to adrenal insufficiency fear.
- Doses should be decreased after improvement.
- Regular or controlled therapy is better maintained with aerosol corticosteroids.

Clinical uses in bronchial asthma

1-Urgent treatment of severe asthma not improved with bronchodilator

IV, inhalation or oral.

2-Nocturnal asthma prevention

oral or inhalation

3-Chronic asthma …Regular aerosol corticosteroid

Side effects:

Suppression of the hypothalamic-pituitary-adrenal axis

- Osteoporosis
- Sodium retention and hypertension
- Cataract
- Impairment of growth in children
- Susceptibility to infection like oral candidiasis, tuberculosis

Stabilizing Mast Cells for Prophylaxis

- Inhibits release of histamine and mediators.
- Alters delayed chloride channel function.
- No role once mediator is released.

Clinical uses

- Exercise and antigen induced asthma
- Occupational asthma

Status asthmatics

Very sever and sustained attack of asthma which fails to respond to treatment with usual measures

Management includes:

A. - Administration of oxygen

B. - Frequent or continuous administration of aerosolized ß2 agonists like salbutamol

C. - Systemic corticosteroid like methyl prednisolone or hydrocortisone IV

D- Aminophylline IV infusion

E - Iv fluid to avoid dehydration

F- Antibiotics in the presence of evidence

Anti-Tussives

•Cough: Protective reflex for expulsion of sputum and irritants.

• Types: Useful productive cough, Useless cough, non-productive chronic cough, and cough due to smoking and local irritants.

• Drugs suppress cough intensity and frequency.

Two Types of Anti-tussives:

Central anti- tussives

Suppress the medullay cough center and may be divided into two groups:

1-Opoid antitussive e.g. codeine, hydrocodeine, etc

2- Non opoid antitussives e.g. dextromethorphan

Peripheral antitussives

Decrease the input of stimuli from the cough receptor in the respiratory passage. e.g: Demulcents e.g. liquorices lozenges, honey

Demulcents and Antitussives Overview

- Demulcents coat irritated pharyngeal mucosa, providing mild analgesic effect.
- Codeine is less addictive and central antitussive, with main side effects: mouth dryness, constipation, dependence.
- Dextromethorphan is an opoid synthetic antitussive, free of analgesic and addictive properties, with main side effects: respiratory depression.

Exploratorants:

- Aid in removing thick mucus from respiratory passages.
- Examples include Ipecac alkaloid, sodium citrate, saline expectorant, guanfenesin, potassium salts.

Mucolytics:

- Liquify mucus and facilitate expectoration.
- Examples include acetylcysteine.

Decongestants:

• Reduce nasal congestion, open clogged passages, enhance sinus drainage.

Mechanism :

They are α1 agonists, which produce localized vasoconstriction on the small blood vessels of the nasal membrane

Used

in congestion associated with rhinitis, hay fever, allergic rhinitis and to a lesser extent common cold. Drugs can be administered nasally or orally for longer duration of action.

Classification:

1. Short acting decongestants administered topically – phenylepherne, phenylpropanolamine

2. Long acting decongestants administered orally - ephedrine, pseudoephedrine, naphazoline

3. Long acting topical decongestants Xylometazoline and oxymetazoline