

Drugs Used in Respiratory System



Website



Videos

DRUGS FOR COUGH

↳ Cough is a protective reflex, for expel of Res. secretions and foreign particles from air passage

↳ It occurs due to mechano or chemoreceptors in throat/Res. passage and/or stretch receptor in lungs

↳ Useless (Non-productive) cough should be suppressed

↳ Res. viral infection is the major cause of acute cough (< 3 weeks), that may be treated by Antibiotics

↳ Symptomatically cough may be treated by: →

I) Pharyngeal Demulcents :- Suppress irritation of mucous membrane by forming protective film.

↳ Glycerine, Liquorice, Lozenges

II) EXPECTORANTS (MUCOKINETICS)

- Are the drug which ↑ secretion and ↓ viscosity & facilitating the removal of cough

A) Enhance Secretion -

↳ Pot. Citrate, Pot. iodide, Guainephenesin, Tolybalsam, Vasaka, Ammonium Chloride

B) Mucolytics - Bromohexine, Ambroxol, Acetylcysteine & Carbocysteine

III) ANTI TUSSIVES (COUGH CENTRE SUPPRESSANTS)

- act on CNS & ↑ threshold of cough centre and reduce tussel impulses in respiratory tract

✓ A) Opioids: - Codeine, Ethylmorphine, Pholcodine

✓ B) Non-opioids - Nascapine, Dextromethorphan, chlorphedianol

✓ C) Antihistamine - chlorpheniramine, Diphenhydramine, Promethazine

IV) ADJUVANTS (Bronchodilators)

- Salbutamol, Terbutaline



DRUGS FOR COUGH

EXPECTORANTS

I. MUCOKINETICS - ↑ bronchial secretion & ↓ mucous viscosity, facilitating removal of cough

Sod./Pot. Citrate - ↑ bronchial secretion by salt action

Pot. iodide - is secreted by bronchial glands and can irritate bronchial airway mucosa.

↳ Long term use of KI affect the thyroid function and can produce iodism. "So not in Use"

Guaiphenesin, Tolubalsam, Vasaka - are plant products → ↑ B. secretⁿ & mucociliary function

Ammonium Salt → are nauseating - reflexly increase respiratory action.

↳ Generally used along with Antitussive & anti-H₂

↳ Amm. Chloride, Sod. citrate, Guaiphenesin are frequently used.

II. Mucolytics →

Bromhexine → Vasicine alkaloid derivative obtained from "Adhatoda vasica" act as a mucokinetic & mucolytics, capable of inducing thin copious bronchial secretion & depolymerises mucopolysaccharides directly & through lysosomal enzyme.

ADR → Rhinorrhoea, Lacrimation, nausea, Gastric irritation, hypersensitivity

Ambroxol → Bromhexine metabolite

Acetylcysteine → Open disulfide bond in mucoproteins present in septum → ↓ viscid
↳ used by orally, and inhalation (10-20f)

Carbocysteine → It liquifies viscid sputum similar as Acetylcysteine and adm. orally (250-750 mg TDS)

± Some time beneficial effects on bronchitis

Contraindicated in peptic ulcer due to gastric mucous breakdown

Uses → Tracheostomy, Asthmatic bronchitis, cystic fibrosis, etc

ANTI-TUSSIVES

- ↳ The drugs which raise the threshold of cough centre in CNS and/or reduce tussal impulses in respiratory tract. (cough suppressant)
- ↳ Used only in dry-nonproductive cough

" OPIOID ANTITUSSIVES "

→ Codeine, Ethylmorphine, Pholcodine

Codeine: → acts on opioid receptor and selectively suppress the cough centre

- ↳ suppress cough for 5 to 6 hrs
- ↳ Abolishes the antitussive actⁿ by Naloxone indicates the role of opioid R in cough in brain
- ↳ This action is independent from analgesic activity

↳ Drug Abuse risk is low

ADR → Constipation, At higher dose Res. depression and drowsiness, Contraindicated in Asthma

Pholcodine: → Antitussive action is similar as Codeine, but has not analgesic & addiction properties.

Longer action → 12 hrs

" NON-OPIOID ANTITUSSIVES "

Noscapine → Benzisoquinolone Opium alkaloid

- ↳ Selective antitussive Action, equipotent as codeine

↳ No - Narcotic action

↳ Useful in spasmodic cough

ADR - Headach, nausea, Bronchoconstriction (due to release of Histamine)

Dextromethorphan →

↳ Synthetic central NMDA receptor blocker.

↳ d-isomer → Antitussive, l-isomer - Analgesic

↳ Not suppress the mucociliary function of airway, and no constipatⁿ action.

↳ No addicting

ADR → Dizziness, Drowsiness, Nausea

At high dose → Hallucination & Ataxia may occurs

Chlophedianol - Centrally acting Antitussive, little antihistaminic & anticholinergic & local anaesthetic property

NASAL DECONGESTANTS

↳ Drugs that are used in the treatment of nasal congestion

↳ Nasal Congestion → is the blockage of nasal passages due to excessive fluids & mucus secretion, caused by common cold, viral infection & sinusitis

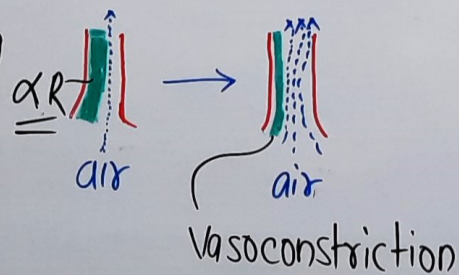
Ideal Properties → Rapid action, No irritation & ADR

Classification →

Ⓐ Oral N.D. = Ephedrine, Pseudoephedrine & phenylephrine

Ⓑ Topical N.D. → Ephedrine, Phenylephrine, xylometazoline, Oxymetazoline, naphazoline

↳ These are α_1 R agonist, cause vasoconstriction in the area of nasal mucosa (0.05 - 0.1% Topical Soluⁿ)



① ORAL → Synthetic α_1 R agonist
→ Vasoconstriction & ↓ blood flow to nasal mucosal area
→ ADR - It may cause ↑ in BP, insomnia, - Avoided in HTN, infant & children

② Local/Topical →

Ephedrine, Phenylephrine → α_1 R agonist

Imidazoline → α_1 R and α_2 R agonist

↳ Produce local vasoconstriction effects by activating α_1 R

↳ Lesser systemic side effects → ↑ BP

↳ Imidazolines may cause CNS depressant effect



RESPIRATORY STIMULANTS

- Also known as **Analeptics**
- Drugs that stimulate the respiration
- Generally used in coma & fainting situatⁿ
- They stimulate respiratⁿ at subconvulsive dose, "Safety of margin is narrow"

DRUGS ⇒ Doxapram, Caffeine, Modafinil
Prethcamide, almitrine

Doxapram — stimulates both central & peripheral chemoreceptor located at medulla & carotid artery. (sensors of O_2 & CO_2 level present in body)

↳ I.V. infusion

- ↳ Uses →
- # fainting
 - # COPD, Res. failure
 - # Barbiturate poisoning
 - # Neonatal apnea

General Side effects - flushing, sweating, insomnia, irritability, involuntary movement, cough, Tremor, etc.

Caffeine - Inhibit PDE → ↑ cAMP at medullary
↓
(+) Respiration ← Sensitive to CO_2

Modafinil → Used in hypercapnic resp. failure (COPD)
→ Dopamine Reuptake Inhibitor → Narcolepsy & Sleep-wake disorder (originally)

Prethcamide → Cropropamide + Croetthamide
↳ (+) Res. Centre - Chemoreceptor (centrally & peripherally)

Almitrine → (+) Peripheral chemoreceptor