

PHARMACEUTICAL CHEMISTRY

CHAPTER- 6

DRUGS ACTING ON ANS

PART-
2

2026 - 27 D.PHARM 1ST YEAR

CHOLINERGIC DRUGS AND RELATED AGENTS



Acetylcholine

is the **neurotransmitter**, which mediates the actions of **cholinergic nervous system**.



Drugs producing effects like **Acetylcholine** are known as **cholinergic drugs** or **Para sympathomimetic drugs**.



कोलिनर्जिक दवाएँ और संबंधित एजेंट



एसिटाइलकोलाइन

वह **न्यूरोट्रांसमीटर** है, जो **कोलिनर्जिक तंत्रिका तंत्र** की क्रियाओं का माध्यम बनता है।



ऐसी दवाएँ जो **एसिटाइलकोलाइन** जैसे प्रभाव उत्पन्न करती हैं, उन्हें **कोलिनर्जिक दवाएँ** या **पैरासिम्पैथोमिमेटिक दवाएँ** कहा जाता है।



CLASSIFICATION:



1

CHOLINERGIC AGONISTS



a) choline esters - Bethanechol



b) natural alkaloids - Pilocarpine



2

CHOLINESTERASE INHIBITORS



a) REVERSIBLE

Short acting - Edrophonium



Intermediate acting - Physostigmine, Neostigmine

Long acting - Pyridostigmine

b) IRREVERSIBLE

Irreversible - Isoflurophate



वर्गीकरण:



1

कोलिनर्जिक एगोनिस्ट्स



a) कोलिन एस्टर्स - बेथानेकोल



b) प्राकृतिक अल्कलॉइड्स - पायलोकार्पिन



2

कोलिनएस्टरेज इनहिबिटर्स



a) रिवर्सिबल (प्रतिवर्ती)

शॉर्ट एक्टिंग - एद्रोफोनियम



इंटरमीडिएट एक्टिंग - फाईसोस्टिग्मिन, नियोस्टिग्मिन

लॉन्ग एक्टिंग - पाइरिडोस्टिग्मिन

b) इरिवर्सिबल (अप्रतिवर्ती)

इरिवर्सिबल - आइसोफ्लूरोफेट



Acetyl choline:-

acetylcholine is an ester of acetic acid and choline, which acts as neurotransmitter.

Properties:-

- Soluble in water or alkali.
- Insoluble in ether.

Uses:-

- Cataract surgery
- Keratoplasty
- Myasthenia Gravis
- Alzheimer's disease

Formulations - Gels

Carbachol :—

Carbachol is chemically a carbamate.

Properties :—

- Prismatic crystals or powder, odourless.
- Develops a faint odour upon standing in open containers.
- Soluble in water, ethanol, methanol and DMSO.
- Insoluble in acetone, chloroform and ether.

Uses →

- used in the treatment of glaucoma.
- ophthalmic surgery.
- used in the eye as eye drops as to decrease the pressure in the eye.

Formulations :-

Tablets

Solution.

Brand Names :- Dichol, Miostat, Isopto, Carbastat, Carbopolic etc.

Pilocarpine :-

it is an alkaloid obtained from the dried leaflets of pilocarpus jaborandi.

Properties :-

- colorless, hygroscopic powder with bitter taste.
- Soluble in water and alcohol.
- insoluble in organic solvents.
- Having M.P - 174°C .

Uses :-

- glaucoma
- antidote for insect poisoning
- parasympathomimetic agent

Brand Names :- Neostigmine, Ocusert Pils etc.

Formulations

- Injections
- eye drops
- Pilocarpine nitrate

Cholinesterase Inhibitors

- Cholinesterase inhibitors (also called acetyl cholinesterase inhibitors) are a group of medicines that block the normal breakdown of acetyl choline.
- Acetyl choline is the main neurotransmitter found in the body. It has functions in both PNS & CNS.

Neostigmine

it is a derivative of carbonic acid ester.

Properties

- white crystalline powder with bitter taste.
- soluble in water, alcohol and chloroform.
- Practically insoluble in ether.

Storage - must be stored in air-tight containers.

Uses :-

- Urinary Retention
- Paralytic ileus
- Cardiac arrhythmias
- Myasthenia Gravis

Brand Names :- Prostigmine, Proserine etc.

Formulations :- Tablets / injections.

Edrophonium Chloride

is a short and rapid acting anticholinesterase drug.

Properties: —

- white or almost white crystalline powder.
- Very soluble in water.
- Soluble in organic solvents

Uses: —

- Myasthenia Gravis
- Skeletal Prolapses to prevent the muscle contractions.

Brand Names: — Eulon. Tensilon etc.....

Tacrine Hydrochloride

Tacrine is a reversible cholinesterase inhibitor and parasympathomimetic agent.

Uses : —

- Respiratory stimulant
- Alzheimer's disease and other CNS disorders.

Brand Names — Congex[®] etc.

Formulations — Capsules / Tablets.

Pralidoxime Chloride

It is a derivative of aldoxime.

Properties :-

- Soluble in water.
- White or pale yellow, odourless crystalline powder.

Uses :-

- Antidote for insect poisoning.
- Anticholinergic.
- Inhibits cholinesterase.

Brand Names :- Protopam,
2-PAM Chloride etc.

CHAPTER-6

PART-4

Cholinergic Blocking Agents



CHOLINERGIC BLOCKING AGENTS

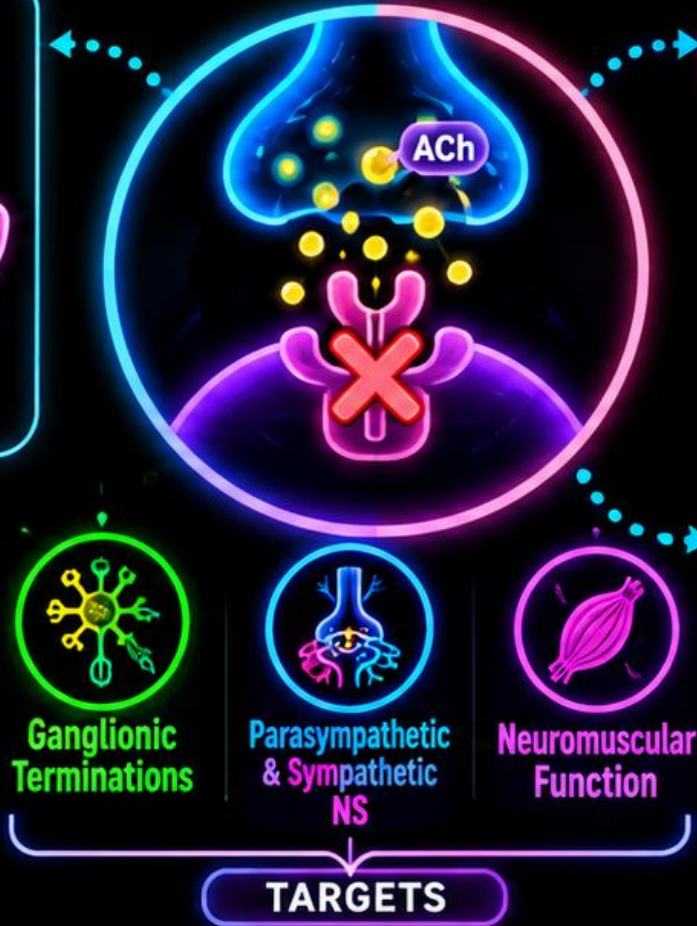
01

Drugs which block the action of acetyl choline are known as **anticholinergic drugs** or **parasympatholytic drugs**. They are also known as **antimuscurinic** and **atropinic** drugs.



02

Cholinergic blocking agents are the agents which act on **ganglionic terminations** of **parasympathetic** and **sympathetic nervous systems** and at the **neuro muscular function** of the **voluntary nervous system**.



कोलिनर्जिक ब्लॉकिंग एजेंट्स



01

ऐसी दवाएँ जो एसीटाइलकोलाइन की क्रिया को अवरुद्ध करती हैं, उन्हें **एंटीकोलिनर्जिक दवाएँ** या **पैरासिम्पेथेटिक दवाएँ** कहा जाता है। इन्हें **एंतिमस्कुरिनिक** और **एट्रोपिनिक** दवाएँ भी कहा जाता है।



02

कोलिनर्जिक ब्लॉकिंग एजेंट्स वे एजेंट्स हैं जो **पैरासिम्पेथेटिक** और **सिम्पेथेटिक** तंत्रिका तंत्र के **गैंगलियोनिक टर्मिनेशन** तथा स्वैच्छिक तंत्रिका तंत्र के **न्यूरोमस्क्युलर फंक्शन** पर कार्य करते हैं।

CLASSIFICATION | वर्गीकरण



1. NATURAL ALKALOIDS | प्राकृतिक एल्कलॉइड्स

Atropine | एंट्रोपीन



2. SYNTHETIC AND SEMI-SYNTHETIC DERIVATIVES | सिंथेटिक एवं सेमी-सिंथेटिक डेरिवेटिक्स



a) MYDRIATICS | मायड्रावटिक्स

Tropicamide, Cyclopentolate |
ट्रोपिकामाइड, साइक्लोपेंटोलेट



b) ANTISPASMODICS | एंटीस्पास्मोडिक्स

Propantheline, Oxyphenonium |
प्रोपैन्थेलीन, ऑक्सीफेनोनियम



c) ANTIPARKINSONIAN DRUGS | एंटीपार्किन्सोनियन ड्रग्स

Trihexyphenidyl |
ट्राइहेक्सिफेनिडिल

Atropine Sulphate

Properties:—

- odourless, white crystalline powder.
- Freely soluble in water and alcohol
- Insoluble in chloroform & ether.

Uses:—

- asthma
- ophthalmology
- to relieve intestinal spasm
- Preanesthetic medications

Formulations:— Tablets / injections / eye ointments / eye drops.

Brand Names:— Propine Tropate, DL- Hyosyamine etc.

Ipratropium Bromide

It is the anhydrous form of the bromide salt of ipratropium.

Properties:—

- white or almost white, odorless & tasteless crystalline powder.
- Freely soluble in water
- Insoluble in ether, chloroform.

Uses: —

- asthma
- COPD (Chronic Obstructive Pulmonary disorder)

Brand Names: — Ipratropium, Mometasone, Salbutamol, Dulcin etc.....

Tropicamide

It is a tropine derivative.

Properties: —

- odourless, white crystalline powder
- soluble in chloroform, ethanol.

Uses: —

— ophthalmology

Formulations

→ eye drops

Brand Name — Prisitropamide, Mydrionyl etc.

Clidinium Bromide

it is a synthetic anticholinergic agent

Uses

- stomach ulcers
- Irritable bowel syndrome
- Intestinal infections
- stomach spasms

Formulations:— Tablets / capsules.

Brand Name:— Clinipox, Cibes etc.....

THANK

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