

ANTHELMINTIC DRUGS

➤ **DRUGS THAT EITHER KILL OR EXPEL HELMINTHS ARE CALLED AS ANTHELMINTIC**

➤ Vermicide : *kill*

➤ Vermifuge : *promote expulsion of worm*

➤ Infection : primary site – *GIT, other tissue , larvae migrate into tissue*

Harm the host by :

➤ Depriving of food

➤ Causing blood loss

➤ Injury to organ

➤ Intestinal or lymphatic obstruction & by secreting toxins

Choice of drugs depends on :

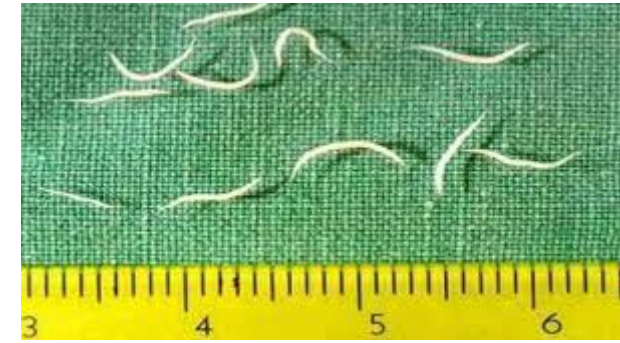
- Efficacy
- Side effects / toxicity
- Dose regimen
- Chance of development of resistance is not a problem

TYPES OF INFECTIOUS AGENT :

Roundworm, Whipworm, Tapeworm, threadworm, Filariasis, hydatid disease



ROUND WORM



THREAD WORM



Filariasis

Sl no	Types of parasite	Drug used
1	ROUND WORM	MEBENDAZOLE ALBENDAZOLE PYRANTEL
2	HOOK WORM	MENBENDAZOLE ALBENDAZOLE PYRANTEL
3	THREAD WORM	MEBENDAZOLE ALBENDAZOLE PYRANTEL
4	TAPE WORM	ALBENDAZOLE PRAZIQUANTEL NICLOSAMIDE
5	HYDATID DISEASE	Albendazole

MEBENDAZOLE :Benzimidazole introduced in1972

- **Broad spectrum** : 1st line drug for round worm, hookworm, pinworm, whipworm infections
- Produced around : 100% cure rate / reduction in egg count in roundworm, hook worm
- Expels trichinella from intestine but can not kill migrated larvae
- Immobilizing and lethal action on worm is slow
(takes 2-3 days)

Mechanism of action :

Binds to *Beta tubulin of parasite* with high affinity



Decreased of *several metabolic activity* of parasite



Inhibition of cytoplasmic microtubule synthesis



Decreased glucose uptake

Adverse reactions :

- Mild nausea, vomiting and diarrhea
- Mild abdominal pain
- Reversible neutropenia and agranulocytosis
- Hypospermia in higher dose

ALBENDAZOLE :BENZIMIDAZOLE

- Broad spectrum well tolerability
- Advantage of single dose administration in many infection
- One dose treatment : Ascariasis, Hoke worm and enterobiasis
- Mebendazole required 3 days to treat above infections
- Result in trichiniasis is inferior to mebendazole

MECHANISM OF ACTION:

- BLOCKS GLUCOSE UPTAKE IN LARVAE
- Deplets glycogen stores
- Leads to decrease formation of ATP
- CAUSED immobilization and death of parasite

Adverse drug reaction:

- Epigastric distress, nausea and diarrhoea
- Headache dizziness
- Hepatotoxicity , bone marrow depression on long term use

PYRANTOL PAMOATE :

- INTRODUCE IN THE YEAR 1969
- FOR PINWORM INFECTION IN CHILDREN
- Extended to roundworm , hookworm
- Efficacy against Ascaris, Enterobius and Ancylostomiasis is more as compare to Mebendazole
- Inactive for Trichuris

MECHANISM OF ACTION :

- Activate Nicotinic cholinergic receptors in parasite worm
- This results in persistent depolarization
- Further contraction and spastic paralysis will occur
- Cholinergic receptor in mammalian skeletal muscles have very low affinity for pyrantel pamoate (only selective towards worm)
- **Adverse effects :**
- Remarkably free of side effects
- Occasionally GIT PAIN, HEADACHE , DIZZINESS

It is tasteless. Non-irritant, No abdominal migration of worm

Diethyl carbamazine Citrate;

- Developed in the year 1948
- First drug for Filariasis caused by *Wuchereria bancrofti* (90%) *Brugia malayi*
- Absorbed after oral ingestion, distributed all over the body metabolized in liver & excreted in urine
- Excretion is faster in acidic urine
- Diethylcarbamazine is Microfilaricidal
- A dose of 2 mg/kg TDS clears MF from peripheral blood in 7 days

Adverse effects :

Anorexia, nausea, vomiting, dizziness, headache, allergic reaction, itching rashes, fever

Decreases BP , bronchospasm

Avoided during pregnancy

NICLOSAMIDE :

- It is vermicide
- Highly effective against Cestodes infesting man, faenia saginata, tselium, Hnana(Hymenolepis nana dwarf tapeworm) and pin worm
- **Mechanism of action :**
- Decreased oxidative phosphorylation in mitochondria and than interfere with Anaerobic generation of ATP by Tapeworm
- After injured by niclosamide tapeworm and parasite digested by intestine

- **Regimen for tapeworm : Available as 0.5g tablet**
- **after a light breakfast 02 tablets are to be chewed & swallowed with water and another 02 hours wash out the worms**
- **For Hnana 02g repeated daily for 05 days**
- **It is safe in pregnancy also**