

Chemotherapy of protozoa disease

Anti-malarial drugs:-

Plasmodium species which infect humans

Plasmodium vivax (tertian):

Plasmodium ovale (tertian)

Plasmodium falciparum (tertian)

Plasmodium malariae (quartan)

Malaria caused by a parasitic protozoa belongs to the family plasmodium.

- Plasmodium vivax, and plasmodium falciparum are the most affected protozoas
- P. Falciparum caused Brain malaria which is fatal for human beings

Antimalarial drugs

- | | |
|---------------------------|-----------------------------------|
| 1. Chincona alkaloids- | Quinine |
| 2. 4 aminoquinoline- | Chloroquine, Hydroxychloroquine, |
| 3. 8 aminoquinolines- | Primaquine |
| 4. Biguanides- | proguanil |
| 5. Diaminopyridines- | Pyrimethamine |
| 6. Quinoline methanol- | Mefloquine |
| 1. Phenanthrene- | Halofantherine |
| • Artemisinin derivatives | Artesunate, Artemether, Arteether |
| • Acridine | Mepacrine, Quinacrine |
| 10. Misellaneous- | sulfonamides Teracycline |
| • | Atavaquone |

1)Quinine

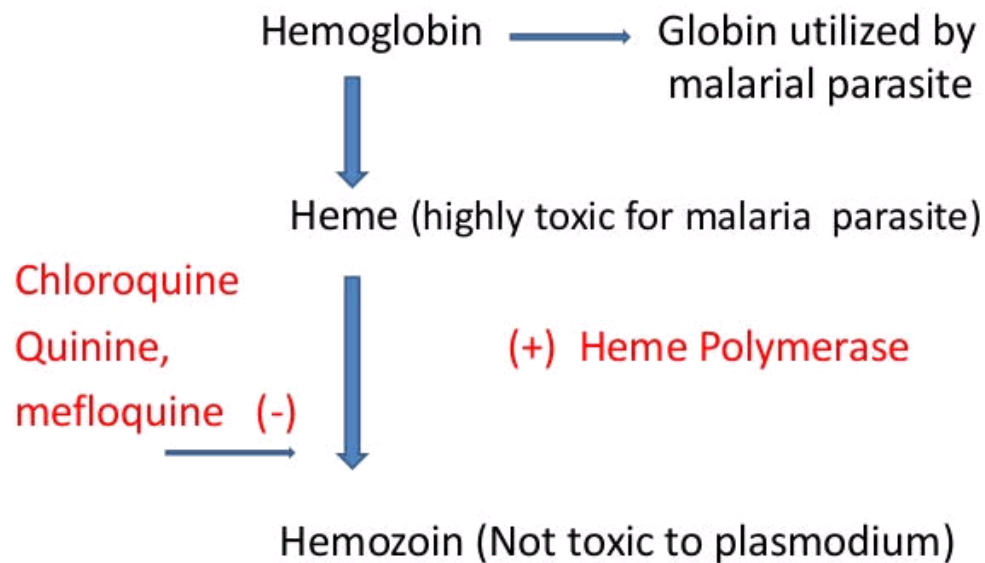
It is an alkaloid obtained from the bark of cinchona tree. It is mainly effective against p. Vivax, and p. Falciparum infection.

Dose:- 300mg -600mg.dose increase according to physician.

Mechanism of action:- it works by increasing the level of haem in the blood which is toxic to malaria parasite and stops the infection from spreading and and kill the protozoa

- Plasmodium convert the blood haem into a haemazoin which is nontoxic for him... antimalaral drugs preventing this conversation of haem to haemazoin.

Mechanism of action



Pharmacokinetics:-

- It is administered orally as well as parenterally.
- 70% plasma protein binding
- Metabolised in liver
- Doesn't cross blood brain barrier and blood placental barrier
- About 20% of drug excrete in urine

Side effects:-

- Vertigo (spinning sensation of head)
- Palpitations (irregular heartbeat)
- Nausea and vomiting

Uses:

- * used to treat fever
- * some times used to maintain electrolytes balance
- * used In muscle cramp

2) chloroquine

It is a 4-ammini alkaline derivative

Dose:- 250mg/orally,40mg/parenterally (Day)

Moa:- same as quinine

P.k:-it is well absorbed from GIT .

- Distribution in body's tissue and cross the BPB but not the CSF
- Metabolised by liver
- Excreted in urine milk and stool.

S.E:- Tinnitus(Hearing of sound when no external sounds is present)

- * Visual disturbance
- * Diplopia(Double vision)

Uses

- Uses to treat rheumatoid arthritis
- Used in initial stage of leprosy

3)primaquine

It is a 8-ammino quinoline derivative

Dose:- 15mg /Day

MOA- same as quinine

P. K:- it is given orally it completely absorbed

- * Distribution in body's tissue including CSF
- * peak plasma time with in 1-2 hours
- * metabolism by liver
- * About 1%drug excrete in urine

S.E:- Urticaria(skin reactions due to food and medicine)

- * GIT discomfort ,Headache

4)Proguanil:-

It is a biguanide derivative

Dose:- 100-300mg/Day

P. K:- Well absorbed from GIT

- * 75%Plasma protein binding
- * slow elimination through urine
- * metabolised by liver

S.E:-Haematuria(Blood in urine),mouth ulcer

* GIT disturbance

5)Arteether

It is a derivative of artemisinin obtained from the Chinese plant artemisia annua.

PLANT- ARTEMISIA ANNUA

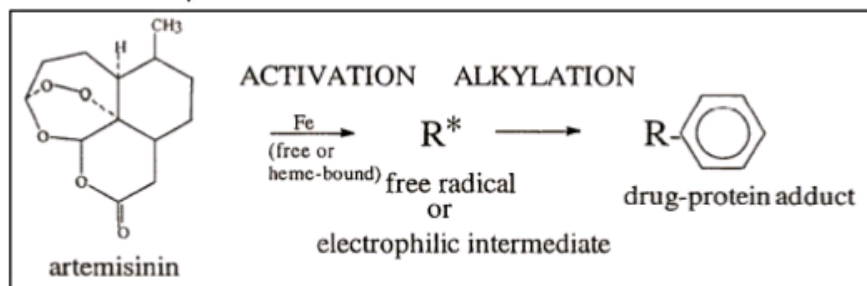


Dose:- 150mg/Day_for_3continuous_days_

MOA-Produce free radicals and harmful chemical and prevent hemozoin conversation and damaged the cell membrane of parasite which leads to death of parasite

Mechanism of action

- These compounds have presence of endoperoxide bridge
- Endoperoxide bridge interacts with heme in parasite
- Heme iron cleaves this endoperoxide bridge
- There is generation of highly reactive free radicals which damage parasite membrane by covalently binding to membrane proteins



P.K:- Absorbed rapidly

- * peak plasma concentration within 1-2 hours
- * metabolised in liver
- * some amount of drug excreted in urine

S.E

- * pain at the site of injection
- * Nausea, Vomiting, Headache

Pharmacological actions

1. Antimalarial action:

- Erythrocytic forms of all malarial parasites including resistant falciparum strains .
- Gametocidal for vivax & malariae

2. Local irritant effect:

- Local pain sterile abscess.

3. Cardiovascular:

- depresses myocardium, ↓ excitability, ↓ conductivity, ↑ refractory period, profound hypotension IV.

4. Miscellaneous actions:

- Mild analgesic, antipyretic activity , stimulation of uterine smooth muscle, curaremimetic effect

