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Pharmacology(Chemotherapy) Assignment

Classify antimalarial drugs and cite specific examples in each class.

Classification

Anti malarial drugs can be classified according to anti malarial activity and according to structure.

1. According to anti malarial activity:

1. Tissue schizonticides for causal prophylaxis:

These drugs act on the primary tissue forms of the plasmodia which after growth within the liver, initiate the erythrocytic stage. By blocking this stage, further development of the infection can be

theoretically prevented. Pyrimethamine and Primaquine have this activity. However since it is impossible to predict the infection before clinical symptoms begin, this mode of therapy is more theoretical than practical.

2. Tissue schizonticides for preventing relapse:

These drugs act on the hypnozoites of *P. vivax* and *P. ovale* in the liver that cause relapse of symptoms on reactivation. Primaquine is the prototype drug; pyrimethamine also has such activity.

3. Blood schizonticides:

These drugs act on the blood forms of the parasite and thereby terminate clinical attacks of malaria.

These are the most important drugs in anti malarial chemotherapy.

These include chloroquine, quinine, mefloquine, halofantrine, pyrimethamine, sulfadoxine, sulfones, tetracyclines etc.

#### 4. Gametocytocides:

These drugs destroy the sexual forms of the parasite in the blood and thereby prevent transmission of the infection to the mosquito.

Chloroquine and quinine have gametocytocidal activity against *P. vivax* and *P. malariae*, but not against *P. falciparum*. Primaquine has gametocytocidal activity against all plasmodia, including *P. falciparum*.

#### 5. Sporontocides:

These drugs prevent the development of oocysts in the mosquito and thus ablate the transmission.

Primaquine and chloroguanide have this action.

Thus in effect, treatment of malaria would include a blood schizonticide, a gametocytocide and a tissue schizonticide (in case of *P. vivax* and *P. ovale*). A combination of chloroquine and primaquine is thus needed in ALL cases of malaria.

2. According to the structure:

1. Aryl amino alcohols: Quinine, quinidine (cinchona alkaloids), mefloquine, halofantrine.

2. 4-aminoquinolines:

Chloroquine, amodiaquine.

3. Folate synthesis inhibitors: Type 1 – competitive inhibitors of dihydropteroate synthase – sulphones, sulphonamides; Type 2 – inhibit dihydrofolate reductase – biguanides like proguanil and chloroproguanil; diaminopyrimidine like pyrimethamine

4. 8-aminoquinolines: Primaquine, WR238, 605

5. Antimicrobials: Tetracycline, doxycycline, clindamycin, azithromycin, fluoroquinolones

6. Peroxides: Artemisinin (Qinghaosu) derivatives and analogues – artemether, arteether, artesunate, artelinic acid

7. Naphthoquinones:

Atovaquone

8. Iron chelating  
agents: Desferrioxamine