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MATRIC NO: 18/MHS/O2/208

QUESTION

Classify the antimalarial agents and state the mechanism or action of each class of drug listed

The classification of antimalarial agent:

- Therapeutic classification
- Chemical classification

THERAPEUTIC CLASSIFICATION

- Casual prophylaxis:[primary tissue schizonticides]
    i. It destroy parasite in liver cells and prevent invasion of erythrocytes
    ii. Primaquine, proguanil

- Suppressive prophylaxis
    i. Suppress the erythrocytic phase and thus attackof malarial fever can be used as prophylactics.
    ii. Chloroquine, proguanil, mefloquine, doxycycline

- Clinical cure: erythrocytic schizonticides
    i. Used to terminate an episode of malarial fever

- Radical curatives

i. It eradicates all forms of p.vivax and p.ovale from the body

- Gametocidal
  i. It destroy gametocytes and prevent transmission
  ii. Primaquine, artemisinn- against all plasmodia
  iii. Chloroquine, quinne- pi vivax

- Sporontocides
  i. Interrupt development of sporogonic phase in mosquitoes
  ii. Proquanil, pyrimethamine

CHEMICAL CLASSIFICATION

1. 4 aminoquinolines:
   - Chloroquine, hydroxychoroquine, amodiaquine, pyronaridine
2. 8 aminoquinolines:
   - Primaquine, tafenoquine, bulaquine
3. Cinchona alkaloids:
   - Quinine, quinidine
4. Quinolone methanol:
   - Mefloquine
5. Biquanides
   - Proquanil, chlorproquanil.

6. Diaminopyrimidines
    - Pyrimethamine
7. Sulfonamides
    - Sulfadoxine, dapsone
8. Tetracyclines:
    - Tetracycline, doxycycline
9. Naphthoquinone:
    - Atovaquone
10. Sesquiterpene lactones:
    - Artesuante, artemether, arteether.

MECHANISM OF DRUG ACTION

1. Chloroquine

It is actively concentrated by sensitive intra-erythrocytic plasmodia by accumulating in the acidic vesicles of the parasite and weakly basic nature it raises the vesicular pH and thereby interferes with degradation of haemoglobin by parasitic lysosomes

Polymerization of toxic haeme to nontoxic parasite pigment hemozoin is inhibited by formation of chloroquine-heme complex Haeme itself or its complex with chloroquine then damages the plasmodial membranes. Clumping of pigment and changes in parasite membranes

follow: death

Other related anti-malarials like amodiaquine quinine, mefloquine, lumefantrine act in an analogous manner.

Mechanism of mefloquine

on the intravesicular PH of the acid vesicles of the parasite is similar to that of chloroquine. Although the uptake of mefloquine by p.falciparum has not been studied quantitatively, the low nanomolar concentrations of mefloquine which raise vesicular PH in the parasite are inconsistent with it pks and indicate that it cannot be acting only as a weak base. Although the nature of the interaction of mefloquine with the parasite vesicle is less well characterized than that of chloroquine alone, to mefloquine alone, or to both drugs. Because the non-weak base effect id observed with -mefloquine in chloroquine-resistant parasites.

Mechanism of quinne and quinidine action

Like chloroquines and mefloquine, quinne and quinidine are diprotic weak bases that can raise

the PH of mammalian and parasite acid vesicles. Because their more acidic pk is 5.1. quinine and quinidine are concentrated in acid vesicles as monoprotic weak based at physiologic PH. This decreases their ability to raise vesicular PH