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PHARMACOLOGY - III

UNIT 3

TOPIC :

- f. Antimalarial drugs



Antimalarial Drugs

- Antimalarial drugs are the chemical agents used for the prevention, treatment, and suppression of malaria, a protozoal disease caused by *Plasmodium* species and transmitted by the bite of infected female *Anopheles* mosquitoes.
- These drugs act by killing the malarial parasites or inhibiting their growth at different stages of their life cycle.

Introduction to Malaria

- Malaria is a serious parasitic disease common in tropical and subtropical regions.

Causative Organisms

Malaria is caused by:

- *Plasmodium vivax*
- *Plasmodium falciparum*
- *Plasmodium malariae*
- *Plasmodium ovale*

Mode of Transmission

- Bite of infected female *Anopheles* mosquito

Symptoms of Malaria

- Fever with chills
- Sweating
- Headache
- Body pain
- Weakness
- Anemia

- Enlarged spleen

Classification of Antimalarial Drugs

1. Tissue Schizonticides

Act on liver stages of parasite.

Examples

- Primaquine

2. Blood Schizonticides

Act on erythrocytic stage.

Examples

- Chloroquine
- Quinine
- Mefloquine
- Artemisinin derivatives

3. Gametocides

Destroy sexual forms of parasite.

Example

- Primaquine

4. Sporontocides

Prevent parasite development in mosquito.

Example

- Primaquine

Chemical Classification of Antimalarial Drugs

1. 4-Aminoquinolines

- Chloroquine
- Amodiaquine

2. Quinoline Methanols

- Quinine
- Mefloquine

3. Artemisinin Compounds

- Artesunate
- Artemether

4. Antifolate Drugs

- Pyrimethamine
- Proguanil

5. Antibiotics Used as Antimalarials

- Doxycycline
- Clindamycin

Antimalarial Drugs

1. Chloroquine

→ Chloroquine is a 4-aminoquinoline antimalarial drug effective against sensitive strains of malaria parasites.

Mechanism of Action

- Chloroquine inhibits heme polymerase enzyme in parasites.
- This causes accumulation of toxic heme leading to parasite death.

Uses

- Malaria caused by sensitive strains
- Amoebic liver abscess
- Rheumatoid arthritis

Adverse Effects

- Itching
- Headache
- Blurred vision
- GI disturbances

2. Primaquine

→ Primaquine is an antimalarial drug effective against liver stages and gametocytes of malaria parasites.

Mechanism of Action

- Produces reactive oxygen species that damage parasite cells.

Uses

- Radical cure of *P. vivax* and *P. ovale*
- Prevention of relapse

Adverse Effects

- Hemolytic anemia in G6PD deficiency
- Abdominal discomfort

3. Quinine

→ Quinine is a natural alkaloid used mainly for severe malaria.

Mechanism of Action

- Interferes with parasite heme metabolism.

Uses

- Severe falciparum malaria

Adverse Effects

- Cinchonism:
 - Tinnitus, Headache, Dizziness
- Hypoglycemia

4. Artemisinin Derivatives

Examples

- Artesunate
- Artemether

Definition

→ Artemisinin compounds are rapidly acting antimalarial drugs derived from *Artemisia annua*.

Mechanism of Action

- Generate free radicals that damage malarial parasite proteins.

Uses

- Falciparum malaria
- Drug-resistant malaria

Adverse Effects

- Nausea, Vomiting, Dizziness

5. Mefloquine

→ Mefloquine is a quinoline methanol antimalarial drug.

Mechanism of Action

→ Interferes with parasite heme detoxification.

Uses

- Chloroquine-resistant malaria

Adverse Effects

- Neuropsychiatric reactions, Nausea, Dizziness

