

MALARIA (contd.)

* Distribution

→ Mostly the malarial parasite is found in the "tropical" conditions
↳ (hot & humid)

which areas are affected?

+ Different strains or species of plasmodium are prevalent or common in diff. regions :-

- (i) *P. vivax* → most wide spread } subtropical regions
- (ii) *P. malariae* } subtropical regions
- (iii) *P. falciparum* → in tropical regions
- (iv) *P. ovale* → very rare, only in Africa
- (v) *P. knowlesi* → zoonotic species
↳ South East Asia

* Pathogenesis :-

+ 2 phases of the life cycle

→ liver phase [No symptoms seen here]
→ Erythrocytic phase.

+ Symptoms → Fever
→ Anaemia
→ Circulatory changes.
→ Immunological changes.

↳ [Symptoms associated only with this stage]

① Fever : Most important symptom because there is a characteristic pattern of fever which corresponds to the life cycle of plasmodium
& Chills
↳ Extreme shivering

Q. when does fever in malaria occur?

Ans. Upon RBC rupture & liberation of merozoite

Q. does the rising of fever (also called "PAROXYSM OF FEVER") vary with species of plasmodium?

Ans. Yes.

As the time period of parasite replication varies from species to species, so does the paroxysm of fever.

<i>P. knowlesi</i>	→	fever rises every	24 hrs.
<i>P. falciparum</i> ; <i>P. vivax</i> & <i>P. ovale</i>	→	" " "	48 hrs
<i>P. malariae</i>	→	" " "	72 hrs.

Q. Can the periodic fever be considered a good diagnostic marker?

Ans. Not always

It is not necessary, especially during initial days of infection, that all the parasite present in the host are at the same stage of life cycle &

∴ might not show a synchronised pattern leading to irregular fever pattern

② Anaemia

Q. What causes anaemia during a malarial infection?

Ans :- [You can only answer if you know the life cycle]

→ During the "erythrocytic phase" of infection the parasite enters the RBCs.

This further leads to :-

① Activation of reticuloendothelial system or the "phagocytic monocytes & macrophages" which scavenge these infected RBCs & ∴ ↓↓ their population.

② The parasite itself bursts the RBCs in order to release merozoites ∴, again ↓↓ RBCs.

③ Upon bursting there is release of toxic substances, which further destroys the non-infected cells & ∴ ↓↓ RBC population.

④ Other reasons :-

→ ↓↓ in bone marrow function due to an imbalance in the cytokine level, thus leading to decreased erythropoiesis

Q. What do you understand by "Black Water Fever"?

→ Another name associated with malaria.

→ Malaria caused by *P. falciparum*, may lead to intravascular hemolysis (breakdown of RBCs), leading to the loss of byproduct of hemoglobin in urine, leading to a BLACK COLORED URINE.

③ Circulatory Changes

↳ Means changes in the blood flow.

Fever in malaria → Vasodilation
or
increase in diameter of blood vessels. → Reduced pressure in blood vessels
↓
Low B.P

+ when such severe circulatory changes take place it can lead to coma

+ Infected RBCs cannot carry O_2 efficiently
∴ lead to → Tissue hypoxia
→ Hypoglycemia
→ Lactic Acidosis

+ when such circulatory changes affect the brain it leads to Cerebral Malaria

④ Immunological Changes

- ↑↑ cytokine levels like Interleukin-1 & TNF
- ↑↑ TNF leads to → cerebral malaria

how

→ leads to accumulation of infected RBCs in the cerebral vascular endothelium

~~see below~~

Athe Ginn