

MALARIA GENERAL INFORMATION

ERIC MA BIOL 370 WED

TRANSMISSION:

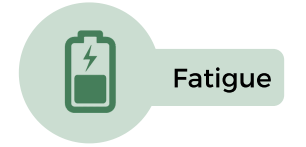
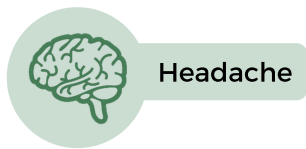
Disease transmitted to humans via a bite from a mosquito infected with *Plasmodium* species.

Mosquitos are the vector but *Plasmodium* is the parasite responsible for Malaria.



(Talapko et al.)

SYMPTOMS:

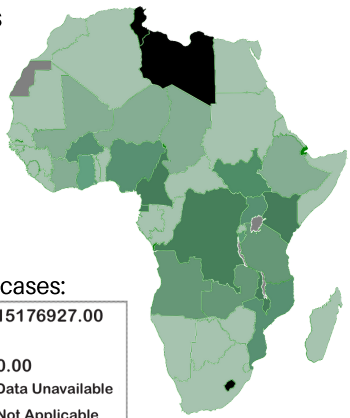


(CDC)

EPIDEMIOLOGY MAP:

Prevalence of Malaria is quite high in Africa, especially these Sub-Saharan countries:

- Dem. Rep. of Congo
- Nigeria
- Kenya
- Uganda
- Mozambique



(Data from WHO)

DIAGNOSIS:

(Talapko et al.)

1. Visualizing blood samples under a microscope to detect *Plasmodium*.
 - a. Fast & cheap, needs microscopes
2. Using rapid diagnostic tests (RDT) to detect antigens of *Plasmodium* in blood.
 - a. Quick & simple
 - b. Needs proper reagents
3. Using polymerase chain reaction (PCR) to detect nucleic acids of *Plasmodium*.
 - a. Slow but accurate, expensive

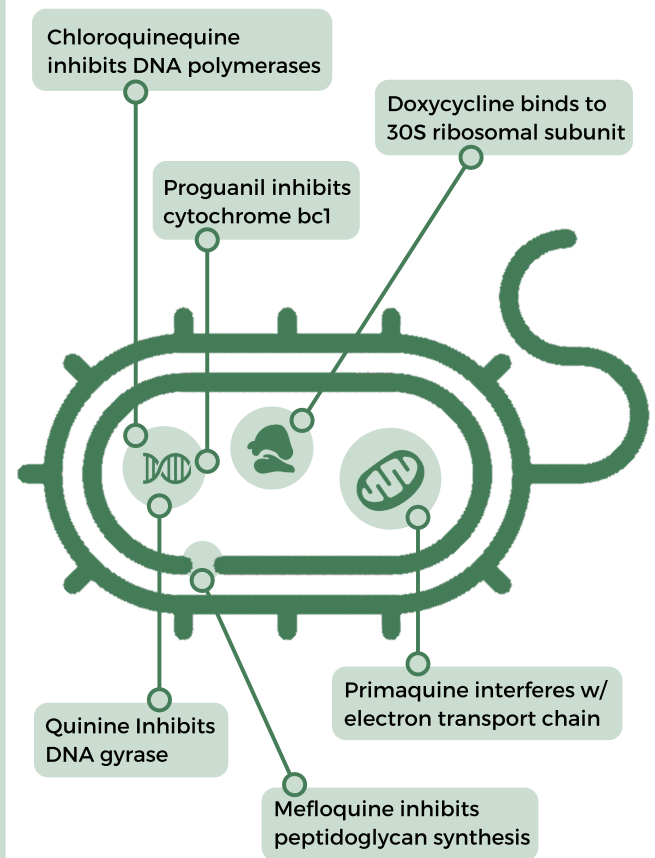
SIDE EFFECTS:

- Quinine** (452 mg x7 days): Headache, Pregnancy complications
- Proguanil** (100 mg x3 days): Anxiety, Headache, Digestive issues, Dizziness, Nausea & Vomiting
- Mefloquine** (1250 mg x1 day): Digestive issues, Epilepsy complications, Pregnancy complications
- Doxycycline** (100 mg x7 days): Photosensitivity, Digestive issues, Nausea & Vomiting
- Chloroquine** (1500 mg x1 day): Headache, Skin irritation, Digestive issues
- Primaquine** (30 mg x14 days): Anemia, Headache, Anorexia & Nausea, Pregnancy complications

(Talapko et al.)
(CDC)

TREATMENT:

(Talapko et al.)



Inhibits *Plasmodium* DNA synthesis:

- Quinine
- Proguanil
- Chloroquine

Inhibits *Plasmodium* protein synthesis:

- Doxycycline

Damages *Plasmodium* membrane:

- Mefloquine

Inhibits *Plasmodium* mitochondria:

- Primaquine

MALARIA & INCREASED RISK FOR PREGNANT WOMEN

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TRANSMISSION:

(Fried et al.)

Plasmodium falciparum is responsible for Malaria risk during pregnancy because after infecting pregnant women, this parasite attaches to chondroitin sulphate A (CSA) & resides near the placenta.

WHAT HAPPENS:

The presence of parasites in bloodstream residing among the placenta causes:

1. An increased inflammatory response due to production of cytokines which sets off a chain of immune responses leading to the death of placental cells.
2. An increase in reactive oxygen species (ROS) leading to oxidative stress which damages lipids, proteins & nucleic acids associated with placental cells.

(Sharma and Shukla)

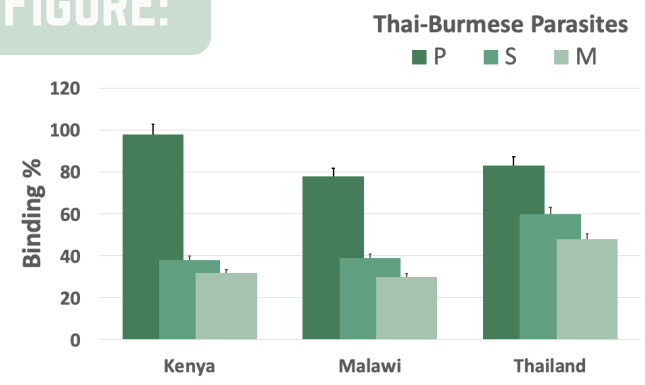
EFFECTS:

Placental damage during pregnancy can result in:

- Abortion
- Still birth
- Intra uterine growth restriction (IUGR)
- Low birth weight
- Premature delivery

(Sharma and Shukla)

FIGURE:



This study used sera from women who were pregnant for the first time (P), pregnant for the second time (S) & pregnant for the third/more time (M) and analyzed the in vitro responses to *P. falciparum*.

Binding percentage of parasite is highest in P rather than S & M. (Fried et al.)

SUSCEPTIBILITY:

Risk for malaria is greatest in women who are pregnant for the first time rather than subsequent additional pregnancies. This is because first time pregnancies lack the antibodies that discourage *Plasmodium falciparum* from attaching to CSA thus making these mothers more susceptible to malaria and more likely to get sick.

In subsequent pregnancies, these mothers have anti-adhesion antibodies and thus become protected against *P. falciparum*.

(Fried et al.)

TREATMENT:

If you are pregnant and live in an area where the prevalence of Malaria is high, it is recommended that you utilize insecticide-treated mosquito nets for prevention.

If you are pregnant and experiencing Malarial symptoms, consult healthcare professionals immediately as they can conduct additional testing for diagnosis and prescribe appropriate medicine such as sulphadoxine-pyrimethamine.

(Sharma and Shukla)

VACCINATION:

Anti-adhesion vaccine to introduce antibodies for first time pregnancies may reduce the risk for Malaria but further research is necessary to see if vaccines could become a potential treatment.

(Fried et al.)

SOURCES:

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CDC - Malaria - About Malaria - FAQs. (2020, September 17). Retrieved November 01, 2020, from <https://www.cdc.gov/malaria/about/faqs.html>

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Malaria - number of reported confirmed cases. (n.d.). Retrieved November 01, 2020, from <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/malaria--number-of-reported-confirmed-cases>

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Talapko, J., Škrlec, I., Alebić, T., Jukić, M., & Včev, A. (2019, June 21). Malaria: The Past and the Present. Retrieved November 01, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6617065/>