



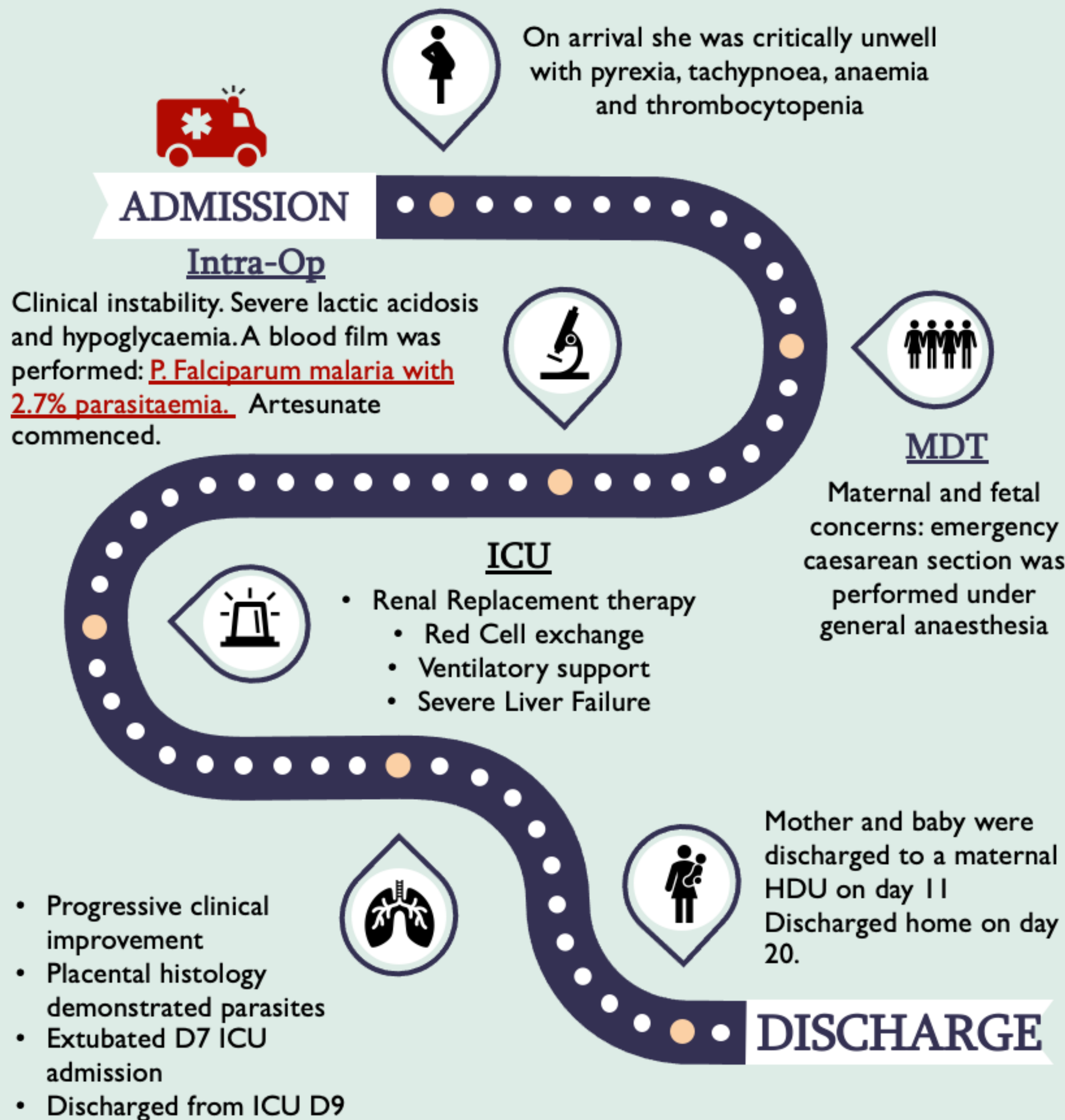
Severe malaria infection and sickle cell crisis in a parturient

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The Case

A 26-year-old woman was transferred to our tertiary centre at 37 weeks' gestation with suspected sickle crisis and elevated pulmonary pressures, she had recently returned from Nigeria.



Fever in the Returned Traveler!

Malaria is the most common tropical disease imported into the UK and must be suspected in returned travellers from endemic regions.

4 main parasites cause the disease:

1. P. falciparum,
2. P. vivax,
3. P. malariae
4. P. ovale

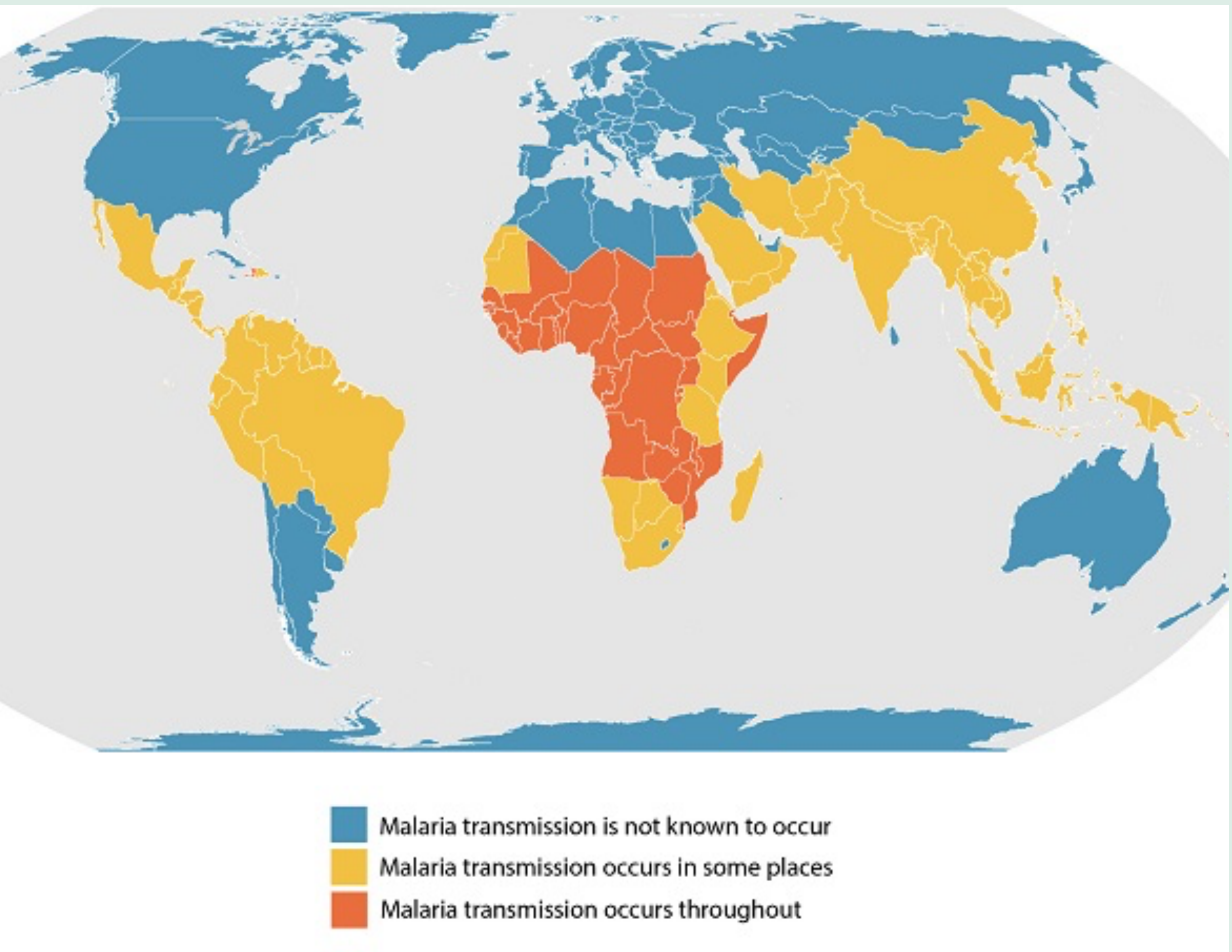


P. falciparum causes greater morbidity.

Transmitted by the bite of a sporozoite-bearing **female anopheline mosquito**.

After a period of pre-erythrocytic development in the **liver**, the blood stage infection, which causes the disease, begins.

Malaria can result in **severe systemic organ dysfunction** such as cerebral disease, anemia and ARDS



<https://www.cdc.gov/malaria/about/distribution.html>

Malaria in Pregnancy

A compromised immune state, which occurs in pregnancy can result in more severe infection³.

Outcomes can result from effects of:

Systemic infection: maternal and fetal mortality, miscarriage, stillbirth and premature birth

Parasitisation: fetal growth restriction and low birth weight, maternal and fetal anaemia, interaction with HIV, susceptibility of the infant to malaria

WHO recently updated guidelines for chemoprophylaxis in pregnancy in 2023¹, and now call for intermittent preventive treatment of malaria in pregnancy in endemic regions. They advise for the use of at least three doses of sulfadoxine-pyrimethamine (SP) during antenatal care (ANC) visits in the second and third trimester of the first and second pregnancies.

Placental Sequestration

Sequestration of parasites within the placenta is a hallmark of P. Falciparum infection in pregnancy. This intervillous sequestration can trigger inflammation within the placenta that can cause pathological changes and poor outcomes. Sequestration can also effect treatment efficacy of antimalarials. Primigravida's have nearly three times the risk of placental malaria as multigravidas

Malaria in Sickle Cell Disease

Sickle cell disease (SCD) is a group of autosomal recessive inherited haemoglobinopathies.

The mutation (Glu6Val) promotes polymerization of deoxygenated sickle haemoglobin S (HbS) and decreased deformability of red blood cells resulting in obstruction of the vasculature and a range of pathophysiological effects including vasoocclusion, organ ischaemia, infarction, and early mortality².

While sickle cell trait is protective against malaria, homozygotic carriers are more likely to develop severe malaria due to severe anaemia and crisis⁴.

Chemoprophylaxis against malaria is advised in children with SCD¹.

References:

- 1) <https://app.magicapp.org/#/guideline/7663> (accessed on 22/4/24)
- 2) Frimpong, A., Thiam, L.G., Arko-Boham, B. et al. Safety and effectiveness of antimalarial therapy in sickle cell disease: a systematic review and network meta-analysis. *BMC Infect Dis* **18**, 650 (2018). <https://doi.org/10.1186/s12879-018-3556-0>
- 3) RCOG The diagnosis and treatment of malaria in pregnancy -(Green Top 54b). 2010. https://www.rcog.org.uk/media/rfrerkjz/gtg_54b.pdf (accessed January 2024)
- 4) Luzzatto L. Sickle cell anaemia and malaria. *Mediterr J Hematol Infect Dis*. 2012;4(1):e2012065. doi: 10.4084/MJHID.2012.065. Epub 2012 Oct 3. PMID: 23170194; PMCID: PMC3499995.
- 5) Zakama AK, Ozarslan N, Gaw SL. Placental Malaria. *Curr Trop Med Rep*. 2020;7(4):162-171. doi: 10.1007/s40475-020-00213-2. Epub 2020 Sep 16. PMID: 32953387; PMCID: PMC7493061.