### Malaria in Pregnancy
- Diagnosis of falciparum malaria in pregnancy is difficult as parasites may not be detectable in blood films due to sequestration in the placenta.

**Complications**
- Severe anaemia
- Renal failure
- Hypoglycaemia
- Hyperpyrexia
- Jaundice
- Pulmonary oedema

- The result may be miscarriage, premature delivery, maternal and/or neonatal death.
- Congenital malaria is rare, but occurs more commonly with P. vivax.

### Severe Malaria
**Definition of severe falciparum malaria by WHO:**
1. Unarousable coma
2. Convulsion
3. Severe bleeding abnormalities
4. Severe anaemia (normochromic, normocytic)
5. Hypotension/shock
6. Hypoglycaemia
7. Haemoglobinuria
8. Acidemia
9. Renal failure
10. Pulmonary oedema/ARDS

### Cerebral Malaria
Unrousable coma in patients with falciparum M.

**Clinical features:**
1. The patient is febrile,
2. Anaemia, sinus tachycardia.
3. Eye: Pupils: mid sized & reactive
4. Fundus: retinal hage
5. Resistance to hand flexion.
6. Positive Babinski sign
7. Cranial nerves abnormalities (rare)
8. Muscle tone may ↑↑ or ↓↓ or normal.

## Complication of Malaria

### Acute
1. Black water fever
   - P. falciparum infection
   - Fever, hemoglobinuria, bilirubinuria, oliguria or even anuria.
2. Hypotension
   - High COP, low systemic vascul. resist., low Bl.P
   - Sudden hypotension and shocked "algid malaria".
   - Orthostatic hypotension
3. Acute pulmonary oedema
4. Acute renal failure

### Chronic (Immune Disorders in Malaria)

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Clinical Picture</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>1. Malarial nephrosis (Quartan nephropathy)</td>
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<td>Nephrotic syndrome with <em>p. malariae</em> infection</td>
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<td>Antigen–antibody complex</td>
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<tr>
<td>1. Proteinuria</td>
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<td>2. Nephrotic syndrome &amp; renal failure</td>
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<tr>
<td>3. Anaemia</td>
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<td>4. Hepatosplenomegaly</td>
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<tr>
<td>Anti malarial do not prevent progression. Corticosteroids are ineffective</td>
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</table>

| 2. "Tropical splenomegaly syndrome" Hyper-reactive malarial splenomegaly (Marked splenomegaly in *P. falciparum* infection) |
| 1) Splenomegaly with normal architecture. |
| 2) Lymphocytes infiltration of hepatic sinusoids |
| 3) Kupffer cell hyperplasia. |
| 4) Hypersplenism → pancytopenia |
| 5) Hypergamaglobulinaemia & high titers of IgM. |
| • Abdominal swelling, dragging pain |
| • Liver is also enlarged. |
| • Anaemia |
| Antimarial → spleen & liver return to normal. Splenectomy in case of hypersplenism |

### Immunosuppressive effects & Burkitt’s lymphoma:
The immunosuppressive effects of malaria may account for the tendency of the Epstein–Barr virus to produce Burkitt’s lymphoma.
**PROPHYLAXIS OF MALARIA FOR TRAVELERS**

1. Suppressive prophylaxis
   - Chloroquine, proguanil, mefloquine, and doxycycline,
   - Effective at killing the parasite in erythrocytic stage (blood stage)
   - Have no effect until the liver stage is complete.
   - So, must be taken for 4 weeks after leaving the area of risk.

2. Causal prophylaxis
   - Primaquine, Atovaquone-proguanil
   - They target blood stages of malaria, and initial liver stage
   - So, can be stopped 7 days after leaving the area of risk

3. Mefloquine: (one tablet 250 mg)
   - used widely because it has a long half-life
   - one tab./week 2 w. prior to travel
   - one tab./week during travel
   - one tab./week for 4 ws. upon return home

4. Doxycycline: (cap100 mg)
   - one to two days before travel, continued for 4 weeks after return home.
   - contraindicated in pregnant women and children < 8 years.

5. Atovaquone-proguanil (250 mg atovaquone/100 mg proguanil)
   - two days before travel
   - continued during travel
   - seven days after return home

6. Chloroquine 300 mg once weekly.

**PROPHYLAXIS IN PREGNANCY**

- Chloroquine and proguanil are safe in all trimesters of pregnancy.
- Pregnant women taking proguanil should receive supplementation with 5 mg folic acid daily for at least the first trimester.

**PROPHYLAXIS IN RENAL IMPAIRMENT**

1) Chloroquine
   - Partially excreted via the kidneys
   - Dose reduction is required only in severe renal impairment

2) Proguanil
   - Wholly excreted via the kidneys, so should be avoided/ the dose reduced
   - Not to be used in patients receiving renal dialysis
     - Doxycycline or mefloquine
   - May be used in severe renal failure.
   - No need to reduce the dose of mefloquine in renal dialysis

**PRIMAQUINE**

Primaquine has 2 uses for malaria prevention:
- Primary prophylaxis in areas with primarily *P. vivax*
- Terminal prophylaxis (antirelapse therapy)
  - In primary prophylaxis, it should be taken 1–2 days before travel, and daily for 7 days after leaving the areas
  - In antirelapse therapy, it is given for 14 days after the traveler has left a malarious area.
  - In G6PD-deficient people, primaquine can cause hemolysis that can be fatal. Before primaquine is used, G6PD deficiency MUST be ruled out by laboratory testing.