MALARIA

DR. Najaf Masood
Introduction

- Characterized by paroxysms of
  - Fever
  - Chills and sweats
  - Fatigue
  - Anemia
  - splenomegaly
Conti........

- 300 – 500 million cases
- >1 million deaths
- Most malarial deaths occur among infants
Plasmodium cause malaria
- Female anopheles
- Four species
  - Falciparum
  - Malariae
  - Ovale
  - Vivax
ETIOLOGY

- Blood transfusion
- Contaminated needles
- Pregnant woman to fetus
- Organ transplantation
Pathogenesis

- Four pathologic processes
  - Fever
  - Anemia
  - Immunopathological events
  - Tissue anoxia
Incubation Period

- P. falciparum
  - 9–14 days
- P. vivax
  - 12–17 days
- P. ovale
  - 16–18 days
- P. malariae
  - 18–40 days.
Clinical manifestation

- Paroxysms of fever
- Fatigue
- Rigors
- Sweats
- Headache/Myalgia
- GIT symptoms
- Abdominal pain
- Pallor
- Jaundice
Children >2 mo of age

- Low grade to >104°F fever
- Headache
- Drowsiness
- Anorexia
- Nausea vomiting, diarrhea,
- Pallor, cyanosis
- Splenomegaly, hepatomegaly,
- Anemia , thrombocytopenia, a normal or low leukocyte count
Severe high risk malaria ...

- Depressed consciousness
- Seizures
- Irregular respiration
- Hypoxia
- Hypotension
- Tachycardia
- Dehydration
- Metabolic acidosis
- hypoglycemia
Congenital malaria

- Between 10-30 days of age
- Fever
- Drowsiness
- Pallor
- Jaundice
- Poor feeding
- Cyanosis
- Hepatosplenomegaly
Diagnosis

- Thick & thin film
- Giemsa stained smear
- Monoclonal antibody test
- Polymerase chain reaction
Differential Diagnosis

- Viral infections
- Meningitis/Encephalitis
- Enteric fever
- Hepatitis
- Gastroenteritis
- Malignancy
# Treatment

<table>
<thead>
<tr>
<th>Uncomplicated/plasmodium F</th>
<th>Chloroquine sensitive</th>
<th>Chloroquine phosphate PO at 6, 24, and 48</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A. Quinine sulfate plus one of the following: doxycycline, tetracycline or clindamycin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Atovaquone-proguanil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Mefloquine</td>
</tr>
<tr>
<td>Uncomplicated malaria/\textit{P. malariae}</td>
<td>All regions</td>
<td>All regions</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Uncomplicated malaria/\textit{P. vivax} or \textit{P. ovale}</td>
<td>Chloroquine phosphate</td>
<td>Chloroquine phosphate plus primaquine phosphate</td>
</tr>
<tr>
<td>Uncomplicated malaria/\textit{P. vivax}</td>
<td>Chloroquine-resistant</td>
<td>Quinine sulfate + either doxycycline or tetracycline or primaquine po4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mefloquine plus primaquine phosphate</td>
</tr>
<tr>
<td>Severe malaria</td>
<td>All regions</td>
<td>Quinidine gluconate plus 1 of the following: doxycycline, tetracycline</td>
</tr>
</tbody>
</table>
Intravenous quinidine gluconate

Complicated malaria

- impaired consciousness
- Severe normocytic anemia
- Renal failure
- Pulmonary edema
- Circulatory shock
- Disseminated intravascular coagulation
- Repeated generalized convulsions
- Protracted vomiting.
Complications

- Cerebral malaria
- Renal failure
- Black water fever
- Pulmonary edema
- Hypoglycemia
- Thrombocytopenia
- Splenic rupture
- Algid malaria
Cerebral malaria

- Acute or insidious onset
- Decreased level of consciousness
- Severe headache
- Fever 106–108°F
- Seizures
- Contracted or unequal pupils
- Signs of upper motor neuron lesion
- Retinal hemorrhages
- Lumbar puncture
  - increased pressure and protein
  - with minimal or no pleocytosis
  - normal glucose concentration
- EEG
  - Non specific
Prevention

- Well screened areas
- Permethrin treated netting
- Insecticides spray
- Mosquito repellents
- Chemoprophylaxis
## Chemoprophylaxis

<table>
<thead>
<tr>
<th>CHLOROQUINE-SUSCEPTIBLE P. FALCIPARUM</th>
<th>Chloroquine phosphate</th>
<th>8.3 mg/kg (5 mg/kg base) once weekly, up to the adult dose of 300 mg base</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHLOROQUINE-RESISTANT P. FALCIPARUM</td>
<td>Mefloquine</td>
<td>&lt;15 kg: 5 mg/kg&lt;br&gt;15–19 kg: ¼ tablet&lt;br&gt;20–30 kg: ½ tablet&lt;br&gt;31–45 kg: 3/4 tablet</td>
</tr>
<tr>
<td>CHLOROQUINE- OR MEFLOQUINE-RESISTANT P. FALCIPARUM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>■ Doxycycline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>■ Atovaquone plus proguanil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8–12 yr : 2 mg/kg once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;13 yr : 100 mg once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11–20 kg: 62.5 mg/25 mg once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21–30 kg: 125 mg/50 mg once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31–40 kg: 187.5 mg/75 mg once daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;40 kg: 250 mg/100 mg once daily</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Immunity

- Hemoglobin S
- Fetal hemoglobin
- Duffy blood group antigen
- Ovalocytes
THANK YOU