National Policy for Malaria Management

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Pediatrician
Quiz activate your mind

1. Are there **vaccine** for malaria??
2. Are there **Alternative** medicine other than chemotherapy??
3. Drug of choice in **high parasitemia**??
4. What is **the best** drug for simple malaria??
5. What the prescription for **P. Malariae** malaria **must contain**??
6. Why the mosquito flies **near face**??
7. Can malaria affects **animals**??
Objectives

• Case definitions
• **National Anti-malarial policy**
• Hints on important aspects
  - endemicity
  - Lab tests
  - scattered information
• Special conditions and Malaria
• Some Update ....
Simple Malaria; Case definition

- Patient with fever or history of fever within the past 48 hours (with or without other symptoms such as nausea, vomiting, diarrhea, headache, back pain, chills, myalgia)
- in whom other obvious causes of fever have been excluded.
- Confirmed by malaria blood film or other diagnostic test for malaria parasites.
Severe Malaria; case definition

- In patient with P. falciparum asexual parasitaemia and no other obvious cause of their symptoms, the presence of *one or more* of the following clinical or laboratory features classifies the patient as suffering from severe malaria:

**Clinical manifestations:**
- prostration
- impaired consciousness
- respiratory distress (acidotic breathing)
- multiple convulsion
- circulatory collapse
Severe Malaria; case definition- cont

- pulmonary oedema
- abnormal bleeding
- jaundice
- hemoglobinuria

Laboratory detected manifestation:
- severe anemia (<7)
- hypoglycemia
- acidosis
- renal impairment
- hyperlactataemia
- Hyperparasitaemia >5%
THE NATIONAL POLICY

- PROTECTION AGAINST MALARIA
- Determine the Purposes of malarial treatments & susceptibility
- Classify the case as - simple “ or ” Sever malaria
- Suspect then confirm the Diagnosis
Simple (uncomplicated) Malaria

CASE DEFINITION

TREATMENT OF FALCIPARUM

Second line treatment

First line treatment

TREATMENT OF non FALCIPARUM.
Purposes of "Antimalarial Drug Policy"

- **Primary purpose:**
  1. *In simple malaria:* To cure by **optimal** regimen and prevent the progression to severe disease and prevent additional **morbidity** associated with treatment failure.
  2. *In severe malaria:* To prevent **death** (then as above)

- **Secondary purpose:** To prevent the emergence and spread of **resistance** to antimalarials.
What is the Best drug for malaria?
Simple ‘uncomplicated’ Malaria plasmodium falciparum

• **First** line treatment *(3 days)*

• The total recommended treatment is
  - 4mg/kg body weight of **Artesunate** given once a day for 3 days, and
  - a single administration of **Fansidar** *(P1.25/S 25mg/kg)* in the first day.
<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Artesunate 50mg tablet (≈ 4mg/kg/dose)</th>
<th>SULFADOXINE PYRIMETHAMINE(500/25) (1.25mg/kg/dose PYRIMETHAMINE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DAY 1</td>
<td>DAY 2</td>
</tr>
<tr>
<td>INFANTS</td>
<td>1/2</td>
<td>1/2</td>
</tr>
<tr>
<td>&gt;=1-6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>&gt;=7-13</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>&gt;13</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Simple ‘uncomplicated’ Malaria plasmodium falciparum

• **Second** line treatment (3 days):
  1- *can’t tolerate* 1st line or *allergic*
  2- *still sick* after 72 hours, or
  3- malaria diagnosis is confirmed, *within 14 days* of initial treatment.
<table>
<thead>
<tr>
<th>Age in Year (kg)</th>
<th>Weight (kg)</th>
<th>Number of tablets per dose (at 0h, 8h, 24h, 36h, 48h, 60h)</th>
<th>Not recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>&lt;5</td>
<td>Artemether (A) 20mg + Lumefantrine (L) 120mg</td>
<td>1</td>
</tr>
<tr>
<td>5-14</td>
<td>&lt;3</td>
<td>Artemether (A) 40mg + Lumefantrine (L) 240mg</td>
<td>2</td>
</tr>
<tr>
<td>15-24</td>
<td>&gt;=3-8</td>
<td>Artemether (A) 60mg + Lumefantrine (L) 360mg</td>
<td>3</td>
</tr>
<tr>
<td>25-34</td>
<td>&gt;=8-14</td>
<td>Artemether (A) 80mg + Lumefantrine (L) 480mg</td>
<td>3</td>
</tr>
</tbody>
</table>

*Each tablet contains artemether 20mg and lumefantrine 120mg in fixed dose combination.*
Severe ‘complicated’ Malaria plasmodium falciparum

- ABCD and APLS
- weight the patient, put iv line, send blood sample for Lab (CBC, smear, RFT, bleeding profile, grouping and cross-matching, s.lactate, VBG, & B.culture)
- A detailed clinical examination (include L.O.C)
- LP for unconscious pt.
- rehydration, ± blood transfusion
Management Severe ‘complicated’ Malaria plasmodium falciparum

• quinine i.v
  (or im-thigh- if iv. not possible and no alternatives are available)
• or
• artemether i.m
• **Dose of quinine** for children:  
  **loading dose**: 20mg of salt/kg by IVI over 4 hours,  
  **maintenance dose**: 10mg salt/kg over 2 hrs BD until the patient can swallow,  
• then quinine tablets, 10mg salt/kg, 8 hourly to complete 7-days course,  
• or quinine IV given for at least 3 days and then shift to first line (AS+S/P) if the patient can swallow.
• Artemether i.m. dosing:
  loading: 3.2mg/kg (2DD 12hrs apart) in the first day
  maintenance: 1.6mg/kg daily for the next 6 days
  or for 3 days then 1st line ttt for 3 days
Severe malaria in remote public health units

- Rectal Artesunate: (50 or 200mg per recto cap)
  10mg/kg, can be repeated after 24hrs
MANAGEMENT OF COMPLICATION

Coma (cerebral malaria)
Maintain airway, place patient on his or her side, exclude other treatable causes of coma.
Avoid harmful ancillary treatment; e.g., hypoglycaemia, bacterial meningitis, such as corticosteroid, heparin and adrenaline; intubate if necessary.

Hyperpyrexia
Administer tepid sponging, fanning, cooling blanket and antipyretic drugs.

Convulsion
Maintain airway; treat promptly with intravenous or rectal diazepam or intramuscular paraldehyde.

Hypoglycemia
Check blood glucose, correct hypoglycemia and maintain with glucose-containing infusion.

Severe anemia
Transfuse with screened fresh whole blood.

Acute pulmonary oedema
Pop patient up at an angle of 45, give oxygen, give a diuretic, stop intravenous fluids, intubate and add positive end-expiratory pressure/continuous positive airway pressure in life threatening hypoxaemia.
Acute renal failure
Exclude pre-renal causes, check fluid balance and urinary sodium; if in established renal failure add haemofiltration or haemodialysis, or if unavailable, peritoneal dialysis. The Benefits of diuretics/dopamine in acute renal failure are not proven.

Spontaneous bleeding and coagulopathy
Transfuse with screened fresh whole blood (cryoprecipitate, fresh frozen plasma and platelet if available); give vitamin K injection.

Metabolic acidosis
Exclude or treat hypoglycaemia, hypovolemia and septicemia. If severe add haemofiltration or haemodialysis.

Shock
Suspect septicemia, take blood for cultures; give parenteral antimicroials, correct hemodynamic disturbances.

Hyperparasitaemia (e.g. >10% of circulating erythrocytes parasitized in non-immune patients with severe disease)
Hints on important aspects

- Endemicity
• G1
• G2
• G3

Malaria-free countries

focal transmission / targeting elimination

High-burden countries
Endemicity

- Measured by:
  1. parasites rate
  2. spleen rate

- NB: about 50% of PF malaria in Yemen is chloroquine resistance malaria
Lab Tests

- Blood film:
  - thick film
  - thin film
- RDT (malaria antigens)
- Experimental: PCR, DNA probe, r-RNA

Confirm DX vs extreme circumstances
Protection /prevention

• Against **vector**: Insecticide Treated Blankets /sheets/cloths ..., repellents, spraying,

• **Environmental** control: spraying, cover the water lacks, biological larvacides(small fishes)

• **Host factors**: chemoprophylaxis, treatment of actual case,
chemoprophylaxis

- mefloquine in Yemen;
- Doxycycline (can be used if mefloquine is contraindicated).

Mefloquine may be used as therapeutic option but a rare but potentially severe neuropsychiatric reactions when used at treatment doses.
<table>
<thead>
<tr>
<th><strong>DOSAGE REGIMEN</strong></th>
<th>5mg/kg weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DURATION OF PROPHYLAXIS</strong></td>
<td>Start at least 1 week (preferably 2-3 weeks) before departure and continue for 4 weeks after return</td>
</tr>
<tr>
<td><strong>COMMEN Ts</strong></td>
<td>Not recommended under 5kg because of lack of data. Do not give mefloquine within 12 hours of quinine. Mefloquine and Other radioactive drugs may be given concomitantly only under close medical Supervision. Ampicillin tetracycline and metoclopramide can increase mefloquine blood levels. Vaccination with live bacterial vaccine (e.g., oral live typhoid vaccine, cholera vaccine, etc.) should be completed at least 3 days before the first prophylaxis dose of mefloquine.</td>
</tr>
</tbody>
</table>
**Use of Doxycycline**

<table>
<thead>
<tr>
<th><strong>Dosage of Regimen</strong></th>
<th>1.5 mg salt/kg daily</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regimen</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Duration of Prophylaxis</strong></td>
<td>Start <strong>1</strong> day before departure and continue for <strong>4</strong> weeks after return</td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td>Contraindicated <strong>under 8</strong> years of age, may cause photosensitivity, esophageal irritation and increase vaginal candidiasis risk</td>
</tr>
</tbody>
</table>
Treatment of non-falciparum malaria
Vivax and ovale malaria cases:

- **Chloroquine** as a schizonticidal drug in a dose of 10mg/kg at the first and second days and then 5mg/kg at the third day.

- **Primaquine** as an anti-relapse measure:
  - 0.25mg/kg daily for 14 days
  - or 0.75mg/kg weekly for 8 weeks in G6PD def

  Primaquine is **contraindicated** in children under 1 year **and** in pregnant women.
## Vivax and ovale malaria cases:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>&lt;1 year (&lt;10 kg)</th>
<th>1-&lt;4 year (10-&lt;17kg)</th>
<th>4-&lt;19 year (17-&lt;30kg)</th>
<th>10-&lt;15 year (30-&lt;45kg)</th>
<th>15 years+ (45kg+)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st day:</strong> Chloroquine</td>
<td>1/2 tablet Or 1 1/2 TSF</td>
<td>1 tablet or 3 TSF</td>
<td>2 tablets</td>
<td>3 tablets</td>
<td>4 tablets</td>
</tr>
<tr>
<td><strong>2nd day:</strong> CQ</td>
<td>1/2 tablet Or 1 1/2 TSF</td>
<td>1 tablets or 3 TSF</td>
<td>2 tablets</td>
<td>3 tablets</td>
<td>4 tablets</td>
</tr>
<tr>
<td><strong>3rd day:</strong> CQ</td>
<td>1/3 tablet or 1 TSF</td>
<td>1/2 tablets or 1 1/2 TSF</td>
<td>1 tablet</td>
<td>1 1/2 tablet</td>
<td>2 tablets</td>
</tr>
<tr>
<td>PQ for antirelapse treatment</td>
<td>nothing</td>
<td>1/2 tablet</td>
<td>1 tablet</td>
<td>1 1/2 tablet</td>
<td>2 tablets</td>
</tr>
</tbody>
</table>
Malariaeae malaria cases:

• **Chloroqiune** as a schizonticidal drug as mentioned for *P. vivax*.

• **Primaquine** as gametocytocidal drug in a single dose of 0.75mg/kg following the chloroquine course.

The dose per age-group is 3 times the amount indicated in the table above of daily doses for radical treatment of *P. vivax*. 
Malaria in pregnancy
# Malaria in pregnancy

<table>
<thead>
<tr>
<th>Drug of choice</th>
<th>Trimester</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quinine PO (Q8hrs) for 7 days</td>
<td>1(^{st}) trimester</td>
<td>Simple Malaria</td>
</tr>
<tr>
<td>As above + fansidar</td>
<td>2(^{nd}) &amp; 3(^{rd}) Tri</td>
<td></td>
</tr>
<tr>
<td>Quinine iv for 7 days</td>
<td>1(^{st}) trimester</td>
<td>Severe Malaria</td>
</tr>
<tr>
<td>Artemether im for 7 days</td>
<td>2(^{nd}) &amp; 3(^{rd}) Tri</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>To avoid hypoglycemia</td>
</tr>
</tbody>
</table>
Some Up to date

- Malaria vaccine
- Exchange transfusion when parasitemia exceeds 10% or if there is evidence of complications (e.g., cerebral malaria) at lower parasite densities.
What about initial Quiz

1. Are there vaccine for malaria??
2. Are there Alternative medicine other than chemotherapy??
3. Drug of choice in high parasitemia??
4. What is the best drug for malaria??
5. What the prescription for **P. Malariae malaria** must contain??
6. Why the mosquito flies near face??
7. Can malaria affects animals??
8. What about Halofantrine??
9. What is **Plasmodium knowlesi**??
References

• National policy of antimalarial drugs
• Nelson
• Red book
• Internet: Emedicine, Pubmed
اليوم العالمي للملاريا 25 إبريل

وزير الصحة: اليعوض الموجود حالياً غير ناقل للملاريا

 يعني دكتور الملاريا دي جاني بالذات وودوو...؟
شكرًا