Malaria - Algorithm for Initial Assessment and Management in Adults

Important information

- Malaria occurs in the tropics and sub-tropics
- Adherence to chemoprophylaxis does not exclude malaria
- Patients with malaria may deteriorate rapidly
- All cases should be discussed with a specialist with current experience of managing malaria
- Notify all cases to the local health protection unit, send blood films to reference laboratories

Triage

- **All febrile or ill patients with a history of travel to a malaria area in the prior 6 months should be assessed urgently** (Incubation for non-falciparum infection may occasionally be greater than 6 months)
- **For those within 3 weeks of return, discuss infection control requirements (eg viral haemorrhagic fever (VHF), avian influenza or SARS) with the duty microbiologist but do NOT delay blood film**

Early diagnosis and assessment of severity is vital to avoid malaria deaths

Expert Advice

Local infectious disease unit or
Liverpool 0151 706 2000
London 0845 155 5000
Ask for duty tropical doctor

Useful information

British National Formulary
UK malaria treatment guidelines:
Lalloo DG *et al. J Infect* 2007; 54: 111-21
from www.hpa.org.uk or
www.britishinfectionsociety.org

Key points in history and examination – no symptoms or signs can accurately predict malaria

- Symptoms are non-specific, but may include: fever/sweats/chills, malaise, myalgia, headache, diarrhoea, cough, jaundice, confusion and seizures
- Consider country of travel, including stopovers, and date of return; falciparum malaria is most likely to occur within 3 months of return, but this may be longer in those who have taken chemoprophylaxis or partial treatment. The incubation period for malaria is at least 6 days
- Consider what malaria prophylaxis was taken (ie drug, dose & adherence); Correct prophylaxis with full adherence does not exclude malaria
- Consider other travel-related infections: eg typhoid fever, hepatitis, dengue fever, avian influenza, SARS, HIV, meningitis/encephalitis and VHF
- Examination findings are non-specific

Urgent investigations – all patients should have:

- Thick & thin blood films and malaria rapid antigen tests. Send to laboratory immediately and ask for a result within one hour
- Full blood count (FBC) for thrombocytopenia, urea & electrolytes (U&Es), liver function tests (LFTs) and blood glucose
- Blood culture(s) for typhoid and/or other bacteraemia
- Urine dipstick (for haemoglobinuria) and culture. If the patient has diarrhoea, send faeces for microscopy and culture
- Chest radiograph to exclude community-acquired pneumonia

If falciparum malaria is confirmed

- Ask the laboratory to estimate the parasite count – ie % of RBCs parasitised
- Clotting screen, arterial blood gases and 12-lead ECG are required in **complicated** infection (see below)
- Do a pregnancy test if there is a possibility of pregnancy; pregnant women are at higher risk of severe malaria

Blood tests show

Non-falciparum malaria

- Vivax
- Ovale
- Malariae

Outpatient therapy usually appropriate depending on clinical judgement

Non-falciparum antimalarials

Chloroquine (base) 600mg followed by 300mg at 6, 24 and 48 hours. **In vivax and ovale** after treatment of acute infection use primaquine (30mg base/day for vivax, 15 mg/day for ovale) for 14 days to eradicate liver parasites; G6PD must be measured before primaquine is given – seek expert advice if low

Falciparum malaria

- Falciparum
- Mixed infection
- Species not characterised

Admit all cases to hospital
Assess severity on admission

Complicated malaria = one or more of:

- Impaired consciousness (measure GCS and MSQ) or seizures **check blood glucose urgently**
- Hypoglycaemia
- Parasite count ≥2% (lower counts do not exclude severe malaria)
- Haemoglobin ≤8g/dL
- Spontaneous bleeding/disseminated intravascular coagulation
- Haemoglobinuria (without G6PD deficiency)
- Renal impairment **or** electrolyte/acid-base disturbance (pH <7.3)
- Pulmonary oedema **or** adult respiratory distress syndrome
- Shock (algid malaria); may be due to Gram negative bacteraemia

No evidence of malaria

A single negative film and/or antigen test does not exclude malaria

- Stop prophylaxis until malaria excluded
- Empirical therapy for malaria should be avoided unless the patient is severely ill. Seek expert advice before commencing this (see contact numbers above)

Blood films daily for 2 more days

- Malaria is unlikely with 3 negative blood films. Consider other travel and non-travel illness
- Finish chemoprophylaxis

Falciparum antimalarials

Uncomplicated:

a) Oral quinine 600mg/8h **plus** doxycycline 200mg daily (or clindamycin 450mg/8hr) for 7 days

OR

b) Malarone®: 4 'standard' tablets daily for 3 days

OR

c) Riamet®: If weight >35kg, 4 tablets then 4 tablets at 8, 24, 36, 48 and 60 hours

Essential features of general management

- Commence antimalarials immediately (see boxes)

Severe malaria

- Consider admission to high dependency/intensive care
- Seek early expert advice from an infection or tropical unit
- Oxygen therapy
- Careful fluid balance (observe JVP, lying/sitting BP and urine output). Avoid hypovolaemia. Over-hydration may induce pulmonary oedema; consider CVP monitoring
- Monitor blood glucose regularly (especially during IV quinine)
- ECG monitoring (especially during IV quinine)
- 4-hourly observations until stable: ie pulse, temperature, BP, RR, SaO2, urine output & GCS. Regular medical review until stable
- Repeat FBC, clotting, U&Es, LFTs and parasite count daily
- In shock, treat for Gram negative bacteraemia

Falciparum antimalarials

Complicated or if patient is vomiting:

EITHER Quinine 20mg/kg loading dose **(no loading dose if patient taking quinine or mefloquine already)** as IVI in 5% dextrose over 4hr and then 10mg/kg as IVI over 4h every 8 hr **plus** oral doxycycline 200mg daily for 7 days (**In pregnancy, use IV/oral clindamycin 450mg/8hr**). Max quinine dose 1.4 g

OR If available, artesunate intravenously 2.4mg/kg at 0,12, 24 hrs then daily to complete a course of seven days plus doxycycline or clindamycin as above

When patient is stable & able to swallow, switch to oral quinine 600mg/8hr **plus** doxycycline 200mg daily (or clindamycin 450mg/8hr) to complete 7 days

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