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Malaria

Disease can manifest months after exposure

BY MARK WISE, MD

Malaria is a parasitic infection of the bloodstream that affects millions of people in tropical countries. With the recent outbreak of malaria in the Dominican Republic and the increased threat in the tsunami-devastated areas, the importance of highlighting the risk of malaria to travellers has been magnified. Each year, hundreds of Canadians become infected with this disease and several even die from it. Myths and misconceptions regarding malaria and antimalarials are prevalent — both among travellers and the medical profession. Malaria should be a preventable and, when necessary, treatable infection. Knowledge of the epidemiology, prevention, clinical features and diagnosis of malaria is important for Canadian physicians to appropriately care for the growing number of international travellers.

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Signs and symptoms

- fever — fever in a returning traveller is malaria until proven otherwise
- headache
- chills
- diarrhoea
- myalgias
- sweats
- malaria may mimic any febrile illness
- rigours
- fatigue

Epidemiology

- malaria is transmitted by the bite of the female *Anopheles* mosquito, which bites between dusk and dawn
- there are four human species of malaria — *P. vivax*, *P. ovale*, *P. malariae* and *P. falciparum*
- only *P. falciparum* can be fatal
- only *P. falciparum* (with slight exceptions) might be resistant to chloroquine
- *P. vivax* and *P. ovale* may persist in the liver and may be “relapsing” (which can be cured)
- rural Central America and Hispaniola (Haiti and the Dominican Republic) have chloroquine-sensitive malaria
- all other malarious areas harbour potentially chloroquine-resistant strains
- the incubation period varies from seven days to several months
- *P. falciparum* usually presents within 30-60 days of exposure

Diagnosis

- thick and thin smears for malaria should be ordered as a STAT request; thin smear determines the species and percentage of parasitemia; thick smear detects small numbers of parasites (not done routinely)
- complete blood count (look for anemia, low-to-normal white blood count) and platelet count (often low)
- rule out other causes of fever (e.g. typhoid, hepatitis, dengue) with liver function tests, blood/urine/stool cultures and serology
- a negative malaria smear does NOT mean the patient doesn't have malaria; repeat the smear in 12-24 hours; keep repeating it until the patient is better or when a diagnosis of malaria or another infection is confirmed

Treatment

- choice of treatment and method of administration depends on the infecting species and severity of illness
- when in doubt, treat as chloroquine-resistant *P. falciparum* malaria
- chloroquine-sensitive malaria
 - chloroquine followed by primaquine, if necessary, to prevent a relapse of *P. vivax* or *P. ovale* after checking glucose-6-phosphate dehydrogenase (G6PD) level
- chloroquine-resistant malaria
 - quinine p.o. or i.v. (or quinidine i.v.) plus doxycycline/clindamycin
 - atovaquone/proguanil
 - supportive care
- often warrants referral to or help from a physician with malaria expertise
- artemisinin compounds are used locally in malarious areas and are quite effective

Prevention

- recommend the use of a DEET-containing (< 30%) repellent
- ensure bed or sleeping area is equipped with a net, preferably impregnated with permethrin
- advise travellers to cover up with clothing (within reason)
- check that the right antimalarial medication is taken properly
- ensure patients are aware of the precautions, contraindications and potential side effects of antimalarials*
- prophylactic therapy depends on:
 - destination
 - duration of travel
 - medical history (e.g. epilepsy, depression, pregnancy, age)
 - cost
 - past experience with antimalarials
- chloroquine-sensitive areas
 - chloroquine: begin one week before departure, weekly while travelling and for four weeks after return
- chloroquine-resistant areas
 - mefloquine: begin one week before departure, weekly while away and four weeks after return
 - doxycycline: begin the day before departure, daily while away and for four weeks after return
 - atovaquone/proguanil: begin the day before departure, daily while away and for seven days after return
 - primaquine: begin the day before departure, daily while away and for seven days after return (check G6PD level first)

* consult references for exact prophylactic and treatment doses

Antimalarial side effects

- Mefloquine**
- GI upset (take with food and lots of water, no alcohol)
 - vivid dreams (common)
 - dizziness
 - insomnia
 - anxiety
 - depression
 - psychosis (rare)
 - seizures (rare)
- Doxycycline**
- photosensitivity
 - yeast infections
 - esophagitis (take with food and lots of water while upright)
- Atovaquone/proguanil**
- GI upset, diarrhea

Further references

- Health Canada: www.phac-aspc.gc.ca/tmp-pmv/pub_e.html
- Centers for Disease Control and Prevention: www.cdc.gov/travel
- The Travel Clinic: www.drwisetravel.com