

Remember to think of malaria: an old world disease, a new world threat

Malaria is a protozoan parasitic disease caused by infection of the red blood cells with one (rarely two) species of the genus *Plasmodium*: *Plasmodium falciparum*, *P. vivax*, *P. ovale* or *P. malariae*. Malaria was first described in the scientific literature in the early 18th century, but it wasn't until 1902 that Sir Ronald Ross identified that it was transmitted by mosquitoes. Malaria is a major public health problem worldwide. Over 2.4 billion people in more than 90 countries—40% of the world's population—are at risk from this infection. The worldwide prevalence of this disease is estimated to be about 300 million to 500 million cases per year with an estimated 1 million deaths; more than 90% of cases are in sub-Saharan Africa.

While the mosquito vectors are not present in British Columbia, travel to malaria endemic areas is common. Returning travelers may come home with more souvenirs than planned, and it is crucial for physicians to remember to think of this disease in patients with fever returning from endemic areas, since it is a potentially life-threatening illness.

Clinical presentations

Taking a travel history is critical. Information about which countries, and which areas within each country, known to be endemic for malaria is available online (www.cdc.gov/malaria/).

Symptoms usually start within 5 to 16 days (varies from species to species) after being bitten by a malaria-infected mosquito. Patients present with fever, chills, sweats, headache, weakness, and malaise—basically, a flu-like illness. Severe disease may develop, most often following infection with *P. falciparum*. Severe ma-

laria due to *P. falciparum*, including cerebral malaria with decreased level of consciousness and other neurological symptoms, may present with pulmonary edema, severe anemia, and renal failure. A combination of these complications is possible. In severe *falciparum* malaria, red cells parasitized by *falciparum* may cause obstruction of capillaries and post-capillary venules, leading to local hypoxia, and have the complications of this disease. Infections due to *P. falciparum* also may progress quickly because this species multiplies rapidly in the blood. Infections due to this species should be considered a potential medical emergency.

Laboratory diagnosis

Samples of peripheral blood (collected from the ear lobe or fingertip) during febrile periods are required. Microscopic examination of thick and thin Giemsa-stained smears of this blood (repeated over several days if the initial smears are negative), remain the best way to diagnose malaria. A thick smear allows medical laboratory technologists to identify even low levels of parasitemia. Examination of thin smears is used for speciation and estimation of the number of parasites present in the blood. Antigen detection tests are also useful, particularly in laboratories where diagnostic experience is limited.

Prevention and treatment

Malaria control in endemic communities depends upon the elimination of mosquitoes, a global challenge. Personal protection, use of prophylactic (suppressant antimalarial therapy) medications, and early treatment of cases are all important to preventing infections.

The widespread resistance of *P. falciparum* to chloroquine complicates the treatment of *falciparum* malaria. When malaria is acquired in areas with known chloroquine resistance, a combination of atovaquone

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and proguanil, or quinine and tetracycline, or doxycycline and clindamycin, may be considered as the possible options. Chloroquine remains highly effective against *P. malariae* and *P. ovale* malaria, as well as *P. vivax* acquired everywhere except in Papua New Guinea and parts of Indonesia. Infections caused by *P. vivax* and *P. ovale* require a follow-up course of primaquine to eradicate latent liver forms that may cause subsequent relapses.

Summary

Malaria is a potentially fatal infection that physicians in BC should consider in febrile, returning travelers. Collection of peripheral blood samples during febrile periods for both thick- and thin-stained smear examination by experienced technologists must be performed as STAT testing in Regional Health Authority Laboratories. The BCCDC Laboratory Services on-call medical microbiologist (604 661-7033) works with regional medical microbiologists or pathologists to expedite requests for assistance in the speciation of the malaria parasite or further investigation of this disease.

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*Continued from page 161***Ethics conference '08**

Our profession's ancient heritage of each day seeking that fine balance between altruism and self-interest (both virtues!) remains an imperative. It is the core that sustains us each as a practitioner and our sum as a profession. Our shrinking planet is buffeting, if not assaulting, that ideal from all angles. In that light, this year's tripartite Ethics Conference will bring attendees together with a diversity of distinguished faculty. Each will bring their own unique perspectives, and each, to broaden those, will be anticipating and encouraging dialogue from around the room and in the corridors.

—T. Peter Seland, MD

eHealth Consultant, CPSBC

Correction: Heavy metal poisoning from Ayurvedic medicines

Please note an error in the recent BCCDC article "Heavy metal poisoning from Ayurvedic medicines" in *BCMJ* 2008;50(2):105. The units for blood lead levels in the first case are described as "mol/L" and should have read "μmol/L." The blood lead levels in the second case are described correctly. This error occurred during production, and is that of the journal, not the author. Our apologies to Mr Rob Gair at the BC Drug and Poison Information Centre.

BCMA scholarships

The BCMA annually presents three scholarships to students planning to pursue post-secondary education in the following school year. The scholarship is for children of BCMA members in good standing. Each scholarship is an award of \$500. Students must be completing, or have completed, high school and plan to continue studies at a recognized post-secondary institution, such as a university, college, or technical school.

The scholarship application deadline is 16 May 2008. Successful applicants will be notified in writing by 30 May 2008. The decision of the administrator/committee is final.

For full details regarding eligibility and application requirements, please visit www.bcma.org/members/bcma_information/bcma_committees/scholarship.htm or contact Mr Vince Lee at 604 638-2838 or e-mail vlee@bcma.bc.ca.

bc centre for disease control*Continued from page 163*

Malaria is a reportable communicable disease in BC and both physicians and laboratories are reminded to report this infection to public health.

—Muhammad Morshed, PhD,
SCCM

—Quantine Wong, BSc

—Judith L. Isaac-Renton, MD,
DPH, FRCPCBC Centre for Disease Control
Laboratory Services, PHS**Further reading**

1. Griffith KS, Lewis LS, Mali S, et al. Treatment of malaria in the United States: A systematic review. *JAMA* 2007;297:2264-2277.
2. Tampuz A, Jereb M, Muzlovic I, et al. Clinical review: Severe malaria. *Crit Care* 2003;7:315-323. Available online: <http://ccforum.com/content/7/4/315>.