# *Public Health*

## The challenge posed by leptospirosis

### *Epidemiology*

Each year an international "EcoChallenge" race involving 4-person teams of men and women is held in a different location, with the teams competing in events such as jungle trekking, open-water swimming and spelunking. This year 76 teams from 26 countries competed in the race, which took place in Borneo from Aug. 20 to Sept. 3.

Four days after the race ended, the US Centers for Disease Control and Prevention (CDC) were notified about a case of acute febrile illness in a 35-year-old man who had run in the event.[1] The Idaho Department of Public Health reported that his illness was characterized by acute onset of high fever, chills, headache and myalgia. Preliminary laboratory diagnosis indicated that the probable cause was leptospirosis, a spirochete infection transmitted to humans through water contaminated with urine from infected animals.

To identify additional athletes with febrile illness, the CDC conducted a telephone survey of the EcoChallenge participants. By Sept. 13, 37 (45%) of the 82 US athletes who had been contacted reported having a fever and 12 had been admitted to hospital. Serum samples taken in the acute phase obtained from 2 athletes in hospital were tested for leptospirosis by the CDC; the results of both the DIP-S-Assay and the ELISA IgM test were positive in 1 athlete. The results for the other athlete were initially negative, but repeat tests of a specimen obtained 4–6 days following the onset of fever yielded positive results.[1]

On Sept. 13 the CDC issued an advisory about the probable leptospirosis outbreak associated with the EcoChallenge event. By Sept. 15, 4 of the 20 Canadian participants were being treated presumptively for leptospirosis.[2]

### *Clinical management*

Leptospirosis may be the world's most widespread zoonosis.[3] Although it is endemic in tropical countries such as Brazil, sporadic outbreaks are not uncommon in temperate regions such as the United States.[4] Typically, humans are infected through occupational or recreational exposure to water, soil or vegetation contaminated by the urine of infected animals; common reservoirs include swine, cattle, dogs, raccoons and rats. Leptospires enter the body through cut or abraded skin, mucous membranes and conjunctivae and cause vasculitis.

The incubation period ranges from 4 days to 4 weeks. The symptom spectrum is broad. The illness usually begins abruptly with fever, chills, rigours (particularly in the calves and lumbar region) and headaches, and may include conjunctivitis, abdominal pain, vomiting, diarrhea and meningeal signs. The acute septicemia may be followed by a secondary phase of severe disease characterized by jaundice, renal failure, hemorrhage or hemodynamic collapse.[4]

The organism may be isolated from samples of blood and cerebrospinal fluid obtained during the first 10 days of illness, and in the urine following the first week of illness. The microagglutination test is the standard for serological diagnosis,[5] but it can be time consuming and difficult to perform. Physicians who suspect a case of leptospirosis should contact their local medical officer of health or the Population and Public Health Branch (formerly the Laboratory Centre for Disease Control) at Health Canada for advice on sample collection and laboratory confirmation.

The CDC recommends that patients with mild cases be treated with doxycycline (100 mg orally, twice daily for 7 days) and that those admitted to hospital because of persistent fever, hepatic or renal failure or severe neurologic disturbance be treated intravenously with penicillin G (1.5 million units every 6 hours for 7 days).[1] However, a recent Cochrane review of the randomized controlled trials in which antibiotics were used to treat leptospirosis[6] identified only 3 trials that met inclusion criteria, 2 of which were of questionable quality. The authors of the review concluded that there is insufficient evidence to provide clear guidelines for antibiotic regimens for treating leptospirosis, although the evidence suggests that penicillin "may cause more good than harm."

### *Prevention*

Chemoprophylaxis for leptospirosis is 200 mg of doxycycline orally once per week.[7] The merits of one 200-mg dose of doxycycline orally for postexposure prophylaxis are unknown. Steps to prevent leptospirosis include recognizing and avoiding swimming or wading in contaminated water and wearing protective clothing and gear such as boots, gloves and aprons. Other steps include controlling rodents, immunizing farm animals and pets, and segregating infected domestic animals. For further information see references 8 and 9. — *Erica Weir*, CMAJ

#### References


1. Public health dispatch: outbreak of acute febrile illness among participants in EcoChallenge Sabah 2000 Malaysia. *MMWR* 2000;49:816-7.
2. Population and Public Health Branch. *Leptospirosis associated with EcoChallenge Sabah 2000 Race in Malaysia: United States* [newsbrief]. Ottawa: Health Canada; 2000 Sept 22. Available: www.hc-sc.gc.ca/hpb/lcdc/bid/dsd/news/nb3800_e.html.
3. Plank R, Dean D. Overview of the epidemiology, microbiology, and pathogenesis of *Leptospira* spp. in humans. *Microbes Infect* 2000;2:1265-76.
4. Outbreak of acute febrile illness among athletes participating in triathlons — Wisconsin and Illinois. *MMWR* 1998;47:585-8.
5. Kauffman A, Weyant R. Leptospiraceae. In: Murray P, Baron E, Pfaller M, Tenover F, Yolken R, editors. *Manual of clinical microbiology*. 6th ed. Washington: American Society for Microbiology; 1995. p. 621-5.
6. Guidugli F, Castro A, Atallah A. Antibiotics for treating leptospirosis [Cochrane Review]. In: *The Cochrane Library*; Issue 3, 2000. Oxford: Update Software.
7. Takafuji E, Kirkpatrick J, Miller R, Karwacki J, Kelley P, Gray M, et al. An efficacy trial of doxycycline chemoprophylaxis against leptospirosis. *N Engl J Med* 1984;310:497-500.
8. Ostroff S, Kozarsky P. Emerging infectious disease and travel medicine. *Infect Dis Clin North Am* 1998;12(1):231-41.
9. Levett P. Leptospirosis: Re-emerging or rediscovered disease? *J Med Microbiol* 1999;48:417-8.