Answer to Photo Quiz: *Borrelia* Species Causing Recurrent Fever

(See page 2395 in this issue [[doi:10.1128/JCM.02511-13](https://doi.org/10.1128/JCM.02511-13)] for photo quiz case presentation.)

Susan E. Sharp

Kaiser Permanente, Portland, Oregon, USA

Borrelia is a Gram-negative bacterium (0.2 to 0.5 μm by 5 to 20 μm) which causes tick-borne relapsing fever (TBRF) and louse-borne relapsing fever. Symptoms consist of recurring episodes of fever, headache, muscle and joint aches, and nausea (1). This organism is able to undergo antigenic variation, which explains the multiple recurrences of fever (<http://www.cdc.gov/relapsing-fever/>).

TBRF is spread by the painless bite of *Ornithodoros* species ticks, which are found in discrete areas throughout the world; in the United States, these ticks are most commonly found in the western states (<http://www.cdc.gov/relapsing-fever/distribution/>). Most TBRF cases occur in the summer months; however, TBRF can also occur in the winter months, when warming cabins can activate infected ticks.

These organisms are best detected in the blood during initial fever episodes, but their numbers wane with subsequent episodes. Acute- and convalescent-phase serum samples should be collected 7 and 21 days, respectively, after the onset of symptoms. Antibody titers should increase 4-fold between acute- and convalescent-phase serum samples to confirm a diagnosis. Of note, patients may have false-positive test results for Lyme disease because of similar proteins.

The tetracyclines/penicillins are most commonly used for treatment; however, treatment itself may cause a severe, sometime fatal, allergic response known as the Jarisch-Herxheimer reaction.

This reaction can cause fever, chills, rigor, hypotension, headache, tachycardia, hyperventilation, vasodilation, and myalgia due to the death of the bacteria and release of endotoxins faster than the body is able to neutralize them.

The physician sent the patient to the emergency room to start doxycycline therapy, with the following note: "If patient okay after 2 h can be d/c home with prescription for P.O. doxycycline $\times$ 10 days. I will follow-up in office as outpatient." The patient did well in the emergency room and completed the course of antibiotics successfully with a complete recovery.

REFERENCE

1. Cutler SJ, Moss J, Fukunaga M, Wright DJ, Fekade D, Warrel D. 1997. *Borrelia recurrentis* characterization and comparison with relapsing-fever, lyme-associated, and other *Borrelia* spp. *Int J Syst Bacteriol* 47:958–968. <http://dx.doi.org/10.1099/00207713-47-4-958>.

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Address correspondence to susan.e.sharp@kp.org.

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