Answer to Photo Quiz: Streptobacillary Rat Bite Fever or Haverhill Fever

(See page 1937 in this issue [doi:10.1128/JCM.02056-14] for photo quiz presentation.)

Ryan F. Relich, a Kathleen M. Boyd, b Morgan H. McCoy, a Cynthia Kaufman, a Edward R. Simpson, a John C. Christenson b

Department of Pathology and Laboratory Medicine, Indiana University School of Medicine, Indianapolis, Indiana, USAA; Department of Pediatrics, Indiana University School of Medicine, Indianapolis, Indiana, USA; Division of Clinical Microbiology, Indiana University Health Pathology Laboratory, Indianapolis, Indiana, USA; Indiana State Department of Health Laboratories, Indianapolis, Indiana, USA

A presumptive identification of Streptobacillus moniliformis was issued upon the basis of the isolate’s morphology, cellular arrangement, and relative biochemical inertness. Sequencing of a 1,442-bp 16S rRNA gene fragment of the isolate yielded 100% identity to the sequences in GenBank under accession numbers NR_074449.1 and DQ325537.1 (S. moniliformis strains DSM 12112 and H2730, respectively). Retrospective analysis of the isolate, in triplicate, by matrix-assisted laser desorption ionization (MALDI)–time of flight mass spectrometry using a Bruker microflex analyzer and MALDI Biotype v3.1 software (Bruker Daltonic, Billerica, MA) also identified the isolate as S. moniliformis, with score values of ≥2.000.

Following issuance of the presumptive identification, the patient was started on empirical amoxicillin therapy. After one night of inpatient stay, he was discharged to home, where he completed a 10-day course of amoxicillin. Following treatment, he did not experience additional episodes of infection recrudescence. Unfortunately, testing of the pet rat for carriage and strain comparison typing of S. moniliformis could not be carried out, as the patient was no longer in possession of the animal following identification of the pathogen.

Cases of streptobacillary disease are infrequently reported in the United States, and data regarding its epidemiological trends are unavailable, as it is not a notifiable disease.

In the Western Hemisphere, S. moniliformis is the principal etiologic agent of rat bite fever. In Asia, however, rat bite fever is usually caused by Spirillum minus, a phylogenetically distinct organism, and the disease it causes is called sodoku (1). S. moniliformis is primarily transmitted by the bite of infected rodents, especially rats and mice (1, 2). However, ingestion of rat excrement-contaminated food, milk, and water are known to transmit the organism, resulting in a disease, Haverhill fever, which has signs and symptoms indistinguishable from those of the rat bite-associated disease (1, 2). In the present case, the patient did not report sustaining a bite, indicating that the clinical picture is more consistent with a diagnosis of Haverhill fever, as it is likely that our patient ingested the organisms following manipulation of his pet rat.

Streptobacillary disease is classically characterized by a triad of fever, rash, and arthritis (3). The natural course of the infection includes relapsing symptoms that last for 2 to 3 weeks, and the majority of cases resolve spontaneously. Serious complications of untreated rat bite fever have been reported, and they include myocarditis, pericarditis, meningitis, soft tissue abscesses, fulminant sepsis, and death (4, 5). At the disease onset, fevers typically begin abruptly, ranging from low grade to 39°C, and the majority of patients (75%) develop a rash that may be maculopapular, petechial, purpuric, or vesicular. The presence of a tender, hemorrhagic vesicular rash on the hands and feet, especially the palms and soles, is strongly suggestive of streptobacillary disease (1). Other symptoms reported frequently include nausea, vomiting, headache, pharyngitis, and myalgias. As the disease progresses, the majority of patients develop migratory polyarthralgias, and some experience symptoms consistent with an upper respiratory tract infection (1, 2, 4). Without a timely diagnosis and administration of appropriate antibiotic therapy, rat bite fever can be fatal in approximately 10% of untreated cases (1).

In the absence of a high index of suspicion, the diagnostic possibility of rat bite fever can be overlooked. Ambiguous clinical features often lead to an extensive differential diagnosis that includes meningococcemia, rheumatic fever, viral exanthems, rickettsial diseases, and drug interactions (5). Diagnosis can be further hindered if patients do not report rodent exposure. Isolation of S. moniliformis in culture is often difficult, which is a consequence of both its nutritional fastidiousness and the susceptibility of many strains to sodium polyanethol sulfonate, a constituent of most commercially prepared blood culture media (6). Culture media supplemented with blood or serum and prolonged incubation, generally up to or longer than 72 h, improve chances of organism recovery (6). S. moniliformis has been successfully recovered from blood, lesion material, and synovial fluid.

The correct and timely diagnosis of streptobacillary disease relies on excellent communication between the patient and the members of the health care team. Patient care providers must strive to elucidate any history of rodent exposure or other risk factors for S. moniliformis infection in addition to recognizing the signs and symptoms of the infection. This information must be relayed to the microbiology laboratory to ensure that cultivation conditions optimal for S. moniliformis recovery are implemented.

REFERENCES


Editor: P. Bourbeau
Address correspondence to Ryan F. Relich, rrelich@iupui.edu.
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