Closing the Brief Case: Rat Bite Fever from a Kiss

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KEYWORDS *Streptobacillus*, rat bite fever

ANSWERS TO SELF-ASSESSMENT QUESTIONS

1. Which of the following is a known transmission modality for rat bite fever?
  - a. Aerosol transmission from a person infected with *S. moniliformis*
  - b. Mucous membrane contact with rat saliva, urine, or fecal matter
  - c. Skin contact with a person infected with *S. moniliformis*
  - d. Aerosol transmission from an asymptomatic rat carrying *S. moniliformis*

Answer: b. Person-to-person and aerosol transmission of *S. moniliformis* have not been demonstrated. Classically, transmission occurs through the bite of a rat. As in the case presented, transmission has also been reported from individuals reporting close contact with rats, rather than a rat bite or other trauma. Consumption of contaminated food or water has also been linked to *S. moniliformis* infection and is referred to as Haverhill fever.

2. Which of the following would best support growth of *S. moniliformis*?
  - a. Eosin methylene blue agar incubated in 5 to 10% CO₂ at 37°C
  - b. Sheep blood agar incubated in room air at 30°C
  - c. Trypticase soy agar incubated in 5 to 10% CO₂ at 37°C
  - d. Hektoen enteric agar incubated in microaerophilic conditions at 37°C

Answer: c. Optimal growth is achieved with Trypticase soy agar incubated in 5 to 10% CO₂ at 37°C. *S. moniliformis* has not been shown to grow on eosin methylene blue or Hektoen enteric agars.

3. What is the preferred initial treatment for bacteremia due to *S. moniliformis*?
  - a. Oral penicillin
  - b. Intravenous penicillin G
  - c. Oral doxycycline
  - d. Intravenous penicillin G with either streptomycin or gentamicin

Answer: b. Intravenous penicillin or ceftriaxone are considered first line agents for complicated and uncomplicated cases of rat bite fever. Oral penicillin would not be appropriate initial therapy, and doxycycline is reserved for severely penicillin allergic patients. Combination therapy of intravenous penicillin with either streptomycin or gentamicin may be considered in cases of *S. moniliformis* infection with endocarditis.

Citation Rodino KG, Miller NE, Pethan KD, DeSimone DC, Schuetz AN. 2020. Closing the Brief Case: Rat bite fever from a kiss. J Clin Microbiol 58:e00678-19. <https://doi.org/10.1128/JCM.00678-19>.

Editor Carey-Ann D. Burnham, Washington University School of Medicine

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See <https://doi.org/10.1128/JCM.00677-19> in this issue for case presentation and discussion.

Published 23 December 2019

TAKE-HOME POINTS

- *S. moniliformis* infection should be considered in patients with the appropriate constellation of symptoms, especially fever, rash, and joint aches regardless of a history of rat bite. A thorough exposure history is important to determine the possibility of rat bite fever (RBF).
- Transmission of RBF classically occurs via bite or scratch but can also occur via mucosal surfaces, as well as by the consumption of food and drink contaminated with rat feces or urine.
- While sodium polyanethole sulfonate (SPS) has been shown to inhibit the growth of *S. moniliformis*, recovery in the presence of SPS is possible. Many modern blood culture bottles, both aerobic and anaerobic, contain SPS, and bottles lacking SPS may not be available in the clinical laboratory. Blood culture should be performed in suspected cases of RBF.
- Treatment is usually undertaken with intravenous penicillin G or ceftriaxone. In severely penicillin-allergic patients, oral doxycycline has been used to successfully treat RBF. A minimum 2 weeks of therapy, for all treatment options, is recommended.