Closing The Brief Case: A Maggot Mystery—Ignatzschineria larvae Sepsis Secondary to an Infested Wound

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KEYWORDS sepsis, bacteremia, wound infection, maggot, larvae, sepsis

ANSWERS TO SELF-ASSESSMENT QUESTIONS

1. *Ignatzschineria* sepsis has been most frequently associated with which of the following preexisting conditions?
   a. Diabetes mellitus
   b. Hypertension
   c. Bipolar disorder
   d. Alcohol use disorder

   Answer: d. *Ignatzschineria* infection has been associated with definitive or probable maggot infestation of wounds in all reported cases to date. Medical conditions that cause peripheral neuropathy predispose to the formation of pressure ulcers. Additionally, sensory impairment can cause these wounds to go unnoticed by the patient and result in delayed clinical attention. Maggot infestation of wounds, in particular, typically presents in the context of additional psychosocial impairment due to the degree of neglect necessary for maggot colonization to occur. Both diabetes mellitus and alcohol use disorder are associated with peripheral neuropathy, and while bipolar disorder can be associated with psychosocial impairment, it does not cause peripheral neuropathy. Alcohol use disorder is associated with both neuropathy and psychosocial impairment, and, as a result, nearly all cases of human *Ignatzschineria* infection have been reported in patients with chronic alcohol use disorder.

2. Which of the following methods can be used to accurately differentiate *Ignatzschineria* species from one another?
   a. Oxidase and catalase reactions
   b. MALDI-TOF mass spectrometry
   c. 16S rRNA sequencing
   d. Whole-genome sequencing

   Answer: d. *Ignatzschineria* species cannot be accurately differentiated by routine biochemical tests, such as oxidase and catalase reactions. In addition, commercial MALDI-TOF mass spectrometry libraries do not contain entries for *I. larvae* or *I. ureiclastica*. Furthermore, 16S rRNA sequencing shows nearly identical homology between *I. larvae* and *I. ureiclastica* species. As demonstrated in this case, only through whole-genome sequencing was species-level identification of *Ignatzschineria larvae* possible.

3. The principle arthropod vector of *Ignatzschineria* is also a major vector of which of the following bacterial species?
   a. Aeromonas hydrophila
   b. Wohlfahrtimonas chitiniciastica


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

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See https://doi.org/10.1128/JCM.02279-20 in this issue for case presentation and discussion.

Published 18 February 2021
c. Wohlfahrtia magnifica
d. Chryseobacterium gleum

Answer: b. Ignatzschineria bacteria are transmitted through larvae of the spotted flesh fly, Wohlfhartia magnifica, a member of the Sarcophagidae family. W. magnifica larvae are a known cause of cutaneous myiasis in humans and animals. They are also a major vector of the bacterium Wohlfhartimonas chitiniclastica, which can cause wound infections and bacteremia in humans, although other fly species have also been described as vectors for W. chitiniclastica.

TAKE-HOME POINTS

- Ignatzschineria species are increasingly recognized as a cause of severe invasive infections in humans, including bacteremia and sepsis.
- Ignatzschineria infection is associated with maggot infestation of open wounds; therefore, most case reports to date describe patients with peripheral neuropathy in association with psychosocial impairment.
- Ignatzschineria species are transmitted to humans through the larvae of Wohlfhartia magnifica, the spotted flesh fly, which is also a major vector of the bacterium Wohlfhartimonas chitiniclastica.
- Reliable species-level identification of Ignatzschineria is challenging in the clinical laboratory and may not be possible by phenotypic methods or 16S rRNA sequencing. However, genus-level identification is sufficient for clinical management of infected patients.