Journal of Community Hospital Internal Medicine Perspectives

Volume 13 | Issue 4 Article 24

2023

A frequently overlooked contaminant: A case of Staphylococcus lugdunensis bacteremia

Nicole Hunter
Department of Internal Medicine, Unity Hospital, Rochester, New York, USA,
nicole.hunter@rochesterregional.org

Alexander Kusnik
Department of Internal Medicine, Unity Hospital, Rochester, New York, USA

Laurie Proia
Department of Internal Medicine, Unity Hospital, Rochester, New York, USA

Recommended Citation

Hunter, Nicole; Kusnik, Alexander; and Proia, Laurie (2023) "A frequently overlooked contaminant: A case of Staphylococcus lugdunensis bacteremia," *Journal of Community Hospital Internal Medicine Perspectives*: Vol. 13: Iss. 4, Article 24.
DOI: 10.55729/2000-9666.1201
Available at: https://scholarlycommons.gbmc.org/jchimp/vol13/iss4/24

CASE REPORT

A Frequently Overlooked Contaminant: A Case of Staphylococcus lugdunensis Bacteremia

Nicole Hunter [a,*], Alexander Kusnik [a], Laurie Proia [a,b]

[a] Department of Internal Medicine, Unity Hospital, Rochester, NY, USA
[b] Department of Infectious Diseases, Unity Hospital, Rochester, NY, USA

To the editor,

Staphylococcus lugdunensis is a coagulase-negative staphylococcus (CoNS) and part of normal skin flora. Although it is a CoNS, it can cause serious infections similar to *Staphylococcus aureus*, such as skin and soft tissue infections, native valve endocarditis, bacteremia, and bone and joint infections. Despite being commonly dismissed as a contaminant, research has revealed the clinical significance of this particular bacterium, even in cases where only one positive blood culture is present.

S. lugdunensis is considered a rare cause of bacteremia, and there are only very few reported cases, potentially also related to the fact that microbiological differentiation of coagulase-negative staphylococci does not always occur.

A 62-year-old man presented with jaundice, fever, and positive blood cultures. He had a medical history significant for liver cirrhosis, congenital aortic stenosis, and diabetes mellitus type II. He had been recently admitted to a different hospital eight days earlier with confusion, stool incontinence, and facial droop, for which he received a stroke workup. The patient spiked a low-grade fever, and blood cultures were collected, indicating growth of *Staphylococcus lugdunensis* after 14 h in 1 of 2 blood cultures. Growth in this blood culture was assumed to be a contaminant. The stroke workup remained negative. A lumbar puncture was performed and was negative. A transthoracic echocardiogram indicated moderate aortic stenosis with mild aortic regurgitation without signs of shunting or vegetation. Repeat blood cultures additionally grew *Staphylococcus lugdunensis* after 12−13 h in 2 of 2 cultures. As the patient's mentation improved and he remained afebrile, he was discharged home with a close follow-up with his primary care physician (PCP) before the results of the repeat blood cultures. Post-discharge follow-up revealed a recurrence of low-grade fevers along with early satiety, worsening jaundice, and tea-colored urine. Repeat blood cultures collected at his PCP office indicated growth of *Staphylococcus lugdenensis*; the patient was therefore referred to the emergency department for further management. Blood cultures (2 of 2) and urine culture from admission grew *Staphylococcus lugdunensis* sensitive to cefazolin, oxacillin (MIC 0.5 mcg/ml), and vancomycin (MIC $\leq$0.5 mcg/ml). The time to positivity for blood cultures was approximately 18 h. A repeat transthoracic echocardiogram demonstrated a left ventricle with hyperdynamic systolic function EF at 75%, mild to moderate aortic stenosis, and dynamic left ventricular outflow tract obstruction. Transesophageal echocardiography indicated a prolapse of the left coronary cusp with now severe aortic regurgitation without signs of vegetations. He was treated for presumed infective endocarditis with a prolonged course of cefazolin.

Staphylococcus lugdunensis, first described in 1988 by Freney et al.,[1] is a coagulase-negative staphylococcus (CoNS). It is a part of normal skin flora more commonly found in the lower part of the body and inguinal folds.[2] Although it is a CoNS, it can cause serious infections similar to *Staphylococcus aureus*, such as skin and soft tissue infections, native valve endocarditis, bacteremia, and bone and joint infections.[3] Etienne et al. described the first case of infective endocarditis,[4] and the course of the disease is often destructive and severe. *S. lugdunensis* is commonly recognized as an infrequent source of bacteremia and infective endocarditis (IE). This

Received 9 March 2023; revised 6 April 2023; accepted 10 April 2023.
Available online 29 June 2023

* Corresponding author at: Department of Internal Medicine, Unity Hospital, 1555 Long Pond Road, Rochester, NY, 14626, USA. Fax: +1 (585) 723 7834.
E-mail address: nicole.hunter@rochesterregional.org (N. Hunter).

https://doi.org/10.55729/2000-9666.1201

assertion is supported by a retrospective study conducted in the United States, which reported only 75 cases of *S. lugdunensis* bacteremia between 2006 and December 2014 out of nearly 400,000 admissions.[5] A 20-year retrospective study identified *S. lugdunensis* as responsible for 18% of coagulase-negative staphylococci causing IE,[6] indicating the need for microbiological differentiation of coagulase-negative staphylococci.[7] Zinkernagel et al.[8] indicated in small case series that 11 out of 13 patients with *S. lugdenensis* endocarditis required cardiac surgery, and the overall mortality was 23% (3 out of 11). Additionally, cases involving hardware such as prosthetic valves and implantable cardioverter-defibrillator (ICD)/pacemakers have been described with mortality rates up to 78% and 14%, respectively.[9] However, *S. lugdunensis* (non-IE) bacteremia appears less aggressive than infections involving the endovasculature[10]; although existing data is scant, many positive blood cultures are likely to be considered a contaminant or insignificant.[11]

This case highlights the potential for *Staphylococcus lugdunensis* bacteremia to be misdiagnosed as a contaminant in blood cultures. In our case, the patient's positive blood culture was initially dismissed, but further investigation revealed a clinically significant infection. According to a retrospective analysis conducted by Fadel et al.,[11] at least 45% of cases (13 out of 29) involving *S. lugdunensis* bacteremia were deemed clinically significant. This finding further emphasizes the significance of distinguishing *S. lugdunensis* from other coagulase-negative Staphylococcus species. Despite a thorough skin examination, the source of *S. lugdunensis* bacteremia was never identified. When *S. lugdunensis* is identified, it is essential to regard this species as pathogenic considering complicated or metastatic infection. Single blood cultures are commonly considered contaminants that might increase the risk of missing relevant bloodstream infections.

Authors' contributions

N.H. and A.K. are responsible for the concept and design of the manuscript; L.P. helped with data acquisition and literature review and contributed to the manuscript's design and writing. All authors critically revised the manuscript, approved the final version to be published, and agreed to be accountable for all aspects of the work.

Conflict of interest

The authors have no conflict of interest. There are no financial conflicts of interest to disclose.

Informed consent was obtained from the patient to publish this case report.

References

1. Freney J, Brun Y, Bes M, et al. Staphylococcus lugdunensis sp. nov. and Staphylococcus schleiferi sp. nov., two species from human clinical specimens. *Int J Syst Bacteriol*. 1988;38:168–172.
2. Bieber L, Kahlmeter G. Staphylococcus lugdunensis in several niches of the normal skin flora. *Clin Microbiol Infect*. 2010;16:385–388.
3. Heilbronner S, Foster TJ. Staphylococcus lugdunensis: a skin commensal with invasive pathogenic potential. *Clin Microbiol Rev*. 2020;34:e00205–e00220.
4. Etienne J, Pangon B, Leport C, et al. Staphylococcus lugdunensis endocarditis. *Lancet*. 1989;1:390.
5. Non LR, Santos CA. The occurrence of infective endocarditis with Staphylococcus lugdunensis bacteremia: a retrospective cohort study and systematic review. *J Infect*. 2017;74:179–186.
6. Patel R, Piper KE, Rouse MS, Uhl JR, Cockerill 3rd FR, Steckelberg JM. Frequency of isolation of Staphylococcus lugdunensis among staphylococcal isolates causing endocarditis: a 20-year experience. *J Clin Microbiol*. 2000;38:4262–4263.
7. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the American heart association. *Circulation*. 2015;132:1435–1486.
8. Zinkernagel AS, Zinkernagel MS, Elzi MV, et al. Significance of Staphylococcus lugdunensis bacteremia: report of 28 cases and review of the literature. *Infection*. 2008;36:314–321.
9. Anguera I, Del Río A, Miró JM, et al. Staphylococcus lugdunensis infective endocarditis: description of 10 cases and analysis of native valve, prosthetic valve, and pacemaker lead endocarditis clinical profiles. *Heart*. 2005;91:e10.
10. Ebright JR, Penugonda N, Brown W. Clinical experience with Staphylococcus lugdunensis bacteremia: a retrospective analysis. *Diagn Microbiol Infect Dis*. 2004;48:17–21.
11. Fadel HJ, Patel R, Vetter EA, Baddour LM. Clinical significance of a single Staphylococcus lugdunensis-positive blood culture. *J Clin Microbiol*. 2011;49:1697–1699.