

ID CORNER

Methicillin-sensitive *Staphylococcus aureus* (MSSA) Bacteremia PearlsChristian Rojas-Moreno¹¹Division of Infectious Diseases, Department of Medicine, University of Missouri, Columbia, Missouri

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Am J Hosp Med 2017 Jul;1(3):2017.026 <https://doi.org/10.24150/ajhm/2017.026>**Question #1:****What does “methicillin-sensitive” mean?**

It means that the isolate is susceptible to beta-lactam antibiotics with anti-staphylococcal activity such as oxacillin, nafcillin, cefazolin and others. In contrast, methicillin-resistant *Staphylococcus aureus* (MRSA) is resistant to most beta-lactams due to a modification of the penicillin-binding proteins that results in lower avidity. Methicillin is actually not commercially available in the United States but when resistance was described in 1961, methicillin was used to treat *S. aureus* infections. So the terminology remains in use because of its historic role.

Question #2:**Does MSSA bacteremia have better outcomes than MRSA bacteremia?**

Yes. Decreased efficacy of vancomycin against *Staphylococcus aureus* (vancomycin is the first line antibiotic for MRSA bacteremia) and delay in appropriate treatment were postulated to be the reasons behind this difference.^{1, 2} But they are both very serious infections, associated with longer hospital stays and high mortality rates.

Question #3:**What are the first line antibiotic choices for MSSA bacteremia?**

Nafcillin (or oxacillin) and cefazolin. Cefazolin is not inferior to nafcillin in terms

of outcomes and it is associated to decreased rates of adverse events compared to nafcillin.^{3, 4} Additionally, cefazolin is less expensive than nafcillin.

Question #4:**In what clinical scenarios should I choose nafcillin or cefazolin over the other?**

Cefazolin needs dose adjustment based on renal function, which we use as an advantage in patients with end-stage renal disease on hemodialysis. We usually recommend 2 grams after each dialysis session, with addition of an extra gram before the long interdialytic period. As a bonus, there is no need to place a long-term line.

Patients with history of non-anaphylactic allergy to penicillin may tolerate cefazolin very well.

In patients with central nervous system infection, nafcillin is the choice because cefazolin has inadequate blood-brain barrier penetrability.

Question #5:**Should I always consult Infectious Diseases (ID) in cases of MSSA bacteremia?**

Yes. If available at your institution, an ID consult has been associated with better adherence to quality measures, decreased rates of treatment failure, decreased mortality and decreased readmission rates.⁵⁻⁷

Question #6:**Can I use levofloxacin for MSSA bacteremia, if antibiogram shows susceptibility?**

No. *Staphylococcus aureus* will rapidly develop resistant and treatment will fail.

Question #7:**Should I treat MSSA bacteremia for 2, 4 or 6 weeks?**

With either MSSA or MRSA bacteremia, a two-week duration of therapy should only be used in cases of *Staphylococcus aureus* bacteremia in which all of the following criteria are met:^{8,9}

- No bone or joint infection
- Endocarditis excluded with echocardiography
- Defervescence within 72 hours with negative follow-up blood cultures
- No prosthetic material (pacer, valve, arthroplasty)
- No evidence of metastatic infection
- No diabetes or immunosuppression

Otherwise, *Staphylococcus aureus* bacteremia requires 4-6 weeks of therapy (endocarditis and bone infections will require at least 6 weeks).

Notes

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