Clinical Practice Variation in the Management of *Staphylococcus aureus* Bacteremia: Results from an Emerging Infections Network Survey

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Background

- Staphylococcus aureus bacteremia (SAB) is associated with high morbidity, mortality, and healthcare costs.[1-2]
- Infectious disease (ID) consultation for SAB has been associated with significant improvement in patient outcomes and mortality.[3-4]
- However, as highlighted by recent posts on the Emerging Infections Network (EIN) listserv, there exists substantial practice variation among ID providers in the management of certain aspects of this condition.
- The EIN is a national network, funded by the Centers for Disease Control (CDC), of infectious diseases physicians in the United States and Canada who are members of the IDSA and active in clinical practice.[5]
- To assess provider opinion and practice habits in the management of SAB, we developed a vignette based survey administered through the EIN.

Methods

- **Design:** Prospective electronic survey using case vignettes
- **Survey format:** 11 question survey using clinical vignettes and multiple choice answers targeting areas in the management of SAB where data are limited or controversial
- The survey was developed by the study authors with beta-testing by fellows and faculty at five academic institutions (UCSF, Fred Hutch, UW, OHSU, UI).
- The web-based survey was then distributed to all members of the EIN with an adult ID practice.
- **Study period:** The survey was open between January 5, 2017 and January 30, 2017.
- All data analysis was performed by the study authors.

Results

- Of 1,286 EIN physician members with an adult ID practice, **723 (56%)** responded to this survey.
- Respondents were varied in their practice experience:

Clinical experience since ID fellowship		Primary hospital type for inpatient work	
≤ 5 years	146 (20.2%)	Community	215 (29.7%)
5-14 years	228 (31.5%)	Non-university teaching	171 (23.7%)
15-24 years	129 (17.8%)	University	260 (36.0%)
≥ 25 years	220 (30.4%)	VA hospital	50 (7.0%)
		City/county	27 (4.0%)

- 54 (7%) answered they did not manage patients with SAB and were thus excluded from the analysis.
- Consensus in management by > 2/3 of respondents:
  - Treatment of SAB due to a skin and soft tissue source with 2 weeks of intravenous (IV) antibiotics
  - Treatment of any single positive blood culture for *S. aureus* as a true pathogen rather than a contaminant
- Heterogenous practice patterns were identified for:
  - Daptomycin dosing **(Table 1)**
  - Isolates with a vancomycin MIC of 2 **(Table 2)**
  - Use of TEE **(Figure 1)**
  - Use of nafcillin versus cefazolin **(Figure 2)**
  - Criteria for extended treatment duration **(Figure 3)**
  - Treatment of persistent MRSA bacteremia (**Figure 4)**
  - Routine diagnostic evaluation of SAB (data not shown)
  - SAB in setting of deep venous thrombosis (data not shown)

Table 1: Daptomycin dosing	n=665
6 mg/kg IV Q24hrs	38.2%
8 mg/kg IV Q24hrs	42.6%
10 mg/kg IV Q24hrs	15.9%
12 mg/kg IV Q24hrs	1.2%
Other	2.1%

Figure 1: Question 3a) In a patient with MRSA bacteremia, what is your prefered choice of valve imaging? (n=667)

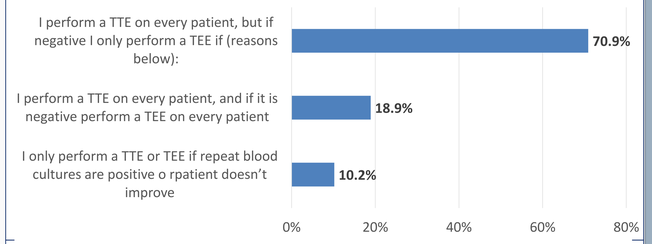
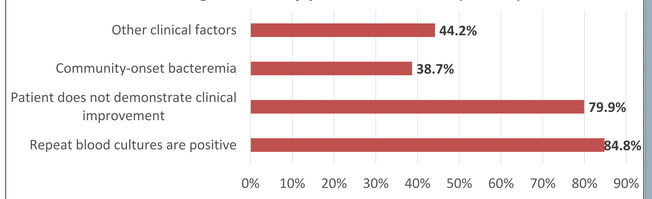
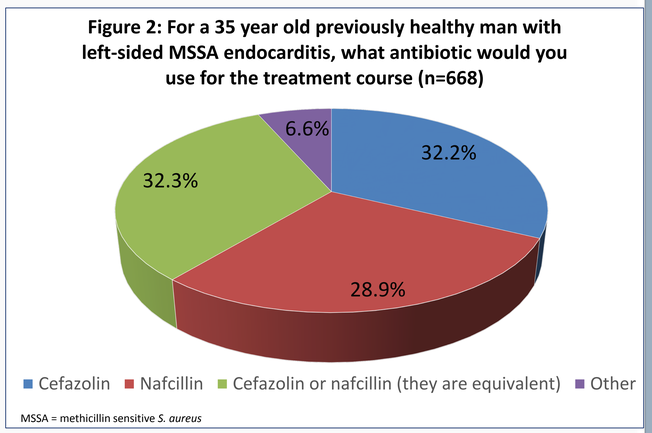


Figure 1: Question 3b) I perform a TTE on every patient, but if negative I only perform a TEE if: (n=468)



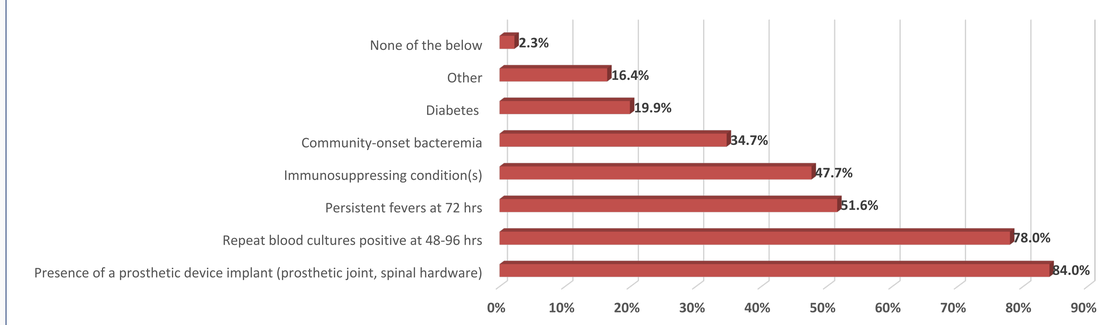
TTE = transthoracic echocardiogram, TEE = transesophageal echocardiogram, MRSA = methicillin resistant *S. aureus*

Figure 2: For a 35 year old previously healthy man with left-sided MSSA endocarditis, what antibiotic would you use for the treatment course (n=668)



MSSA = methicillin sensitive *S. aureus*

Figure 3: In MRSA bacteremia, which would increase your treatment duration from 2 weeks to 4-6 weeks assuming that a TTE and/or TEE are negative? (n=663)

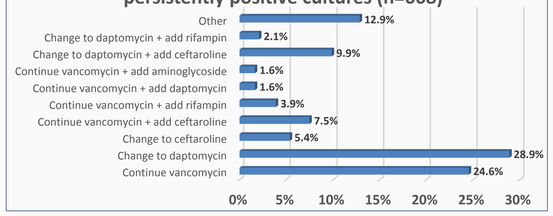


TTE = transthoracic echocardiogram, TEE = transesophageal echocardiogram, MRSA = methicillin resistant *S. aureus*

Results Continued

Table 2: Treatment of MRSA bacteremia with a vancomycin MIC = 2	n=665
Treat with vancomycin as long as patient demonstrates clinical and microbiologic response	50.5%
Treat with daptomycin	37.3%
Treat with ceftaroline	4.4%
Treat with daptomycin or ceftaroline	3.2%
Treat with linezolid	0.8%
Other	4.0%

Figure 4: Treatment of MRSA bacteremia with persistently positive cultures (n=668)



Discussion

- SAB is a severe disease commonly encountered by ID providers, but this survey highlights the significant practice variability for this condition amongst survey respondents who represent a wide breadth of ID practitioners in North America.
- One interesting finding of the survey is that practice variation was equally present for scenarios for which there are some data and expert consensus and situations where there are not.
- There is also a minority but notable divergence from traditional ID dogma in areas such as the use of oral antibiotics for SAB, repeat blood cultures to document SAB clearance, and TTE in all cases of SAB.
- Qualitative comments are currently under analysis.

Conclusion

- Although there are some areas of consensus, there is significant variability in clinical management of common SAB scenarios.
- This variability highlights both the disease complexity and the need for ongoing research in this domain.
- Clinical practice guidelines will likely be of significant importance for this common and morbid condition in which the appropriate management of many common scenarios is unclear.

References

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