EDITORIAL

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S aureus bacteremia: TEE and infectious disease consultation

Morbidity and mortality rates in patients with *Staphylococcus aureus* bacteremia remain high even though diagnostic tests have improved and antibiotic therapy is effective. Diagnosis and management are made more complex by difficulties in finding the source of bacteremia and sites of metastatic infection.

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S aureus bacteremia is a finding that demands further investigation, since up to 25% of people who have it may have endocarditis, a condition with even worse consequences.[1] The ability of *S aureus* to infect normal valves[2,3] adds to the challenge. In the mid-20th century, Wilson and Hamburger[4] demonstrated that 64% of patients with *S aureus* bacteremia had evidence of valvular infection at autopsy. In a more recent case series of patients with *S aureus* endocarditis, the diagnosis was established at autopsy in 32%.[5]

Specific clinical findings in patients with complicated *S aureus* bacteremia—those who have a site of infection remote from or extended beyond the primary focus—may be useful in determining the need for additional diagnostic and therapeutic measures.

In a prospective cohort study, Fowler et al[6] identified several factors that predicted complicated *S aureus* bacteremia (including but not limited to endocarditis):

- Prolonged bacteremia (> 48–72 hours after initiation of therapy)
- Community onset
- Fever persisting more than 72 hours
- Skin findings suggesting systemic infection.

doi:10.3949/ccjm.85a.18061

THE ROLE OF ECHOCARDIOGRAPHY

Infective endocarditis may be difficult to detect in patients with *S aureus* bacteremia; experts recommend routine use of echocardiography in this process.[7,8] Transesophageal echocardiography (TEE) detects more cases of endocarditis than transthoracic echocardiography (TTE),[9,10] but access, cost, and risks lead to questions about its utility.

Guidance for the use of echocardiography in *S aureus* bacteremia[1,10–14] continues to evolve. Consensus seems to be emerging that the risk of endocarditis is lower in patients with *S aureus* bacteremia who:

- Do not have a prosthetic valve or other permanent intracardiac device
- Have sterile blood cultures within 96 hours after the initial set
- Are not hemodialysis-dependent
- Developed the bacteremia in a healthcare setting
- Have no secondary focus of infection
- Have no clinical signs of infective endocarditis.

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Heriot et al[14] point out that studies of risk-stratification approaches to echocardiography in patients with *S aureus* bacteremia are difficult to interpret, as there are questions regarding the validity of the studies and the balance of the risks and benefits.[1] The question of timing of TEE remains largely unexplored, both in initial screening and in follow-up of previously undiagnosed cases of *S aureus* endocarditis.

In this issue of the *Journal*, Mirrakhimov et al[15] weigh in on use of a risk-stratification model to guide use of TEE in patients with *S aureus* bacteremia. Their comments about avoiding TEE in patients who have an alternative explanation for *S aureus* bacteremia and a

low pretest probability for infectious endocarditis and in patients with a disease focus that requires extended treatment are derived from a survey of infectious disease physicians.[16]

ROLE OF INFECTIOUS DISEASE CONSULTATION

Infectious disease consultation reduces mortality rates and healthcare costs for a variety of infections, with endocarditis as a prime example.[17] For *S aureus* bacteremia, a large and growing body of literature demonstrates the impact of infectious disease consultation, including improved adherence to guidelines and quality measures,[18–20] lower in-hospital mortality rates[18–21] and earlier hospital discharge.[18] In the era of "curbside consults" and "e-consultation," it is interesting to note the enduring value of bedside, in-person consultation in the management of *S aureus* bacteremia.[20]

Many people with *S aureus* bacteremia should undergo TEE. Until the evidence becomes more robust, the decision to forgo TEE must be made with caution. The expertise of infectious disease physicians in the diagnosis and management of endocarditis can assist clinicians working with the often-complex patients who develop *S aureus* bacteremia. If the goal is to improve outcomes, infectious disease consultation may be at least as important as appropriate selection of patients for TEE.

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