Ultrasounds for heart infections can be reduced by following simple rules

Staphylococcus aureus bacteria often cause severe bloodstream infections, called *Staph aureus* bacteremia (SAB). Once *Staph aureus* enters the bloodstream it can spread to the heart and cause an infection of the heart valves called infective endocarditis (IE). Current medical guidelines recommend a heart ultrasound (echocardiogram) for every patient with SAB to see if the bloodstream infection has caused endocarditis. Two types of echocardiogram with different strengths and limitations can be done. A transthoracic echocardiogram (TTE) involves a probe placed on the outside of the chest and is not invasive. A transesophageal echocardiogram (TEE) requires inserting a probe into the patient's esophagus and takes a clearer picture than the non-invasive TTE. Although guidelines currently recommend the TEE for all patients with SAB, physicians often do not follow these guidelines because the TEE is much more uncomfortable for the patient, and not every hospital has the personnel or equipment necessary to do this test.

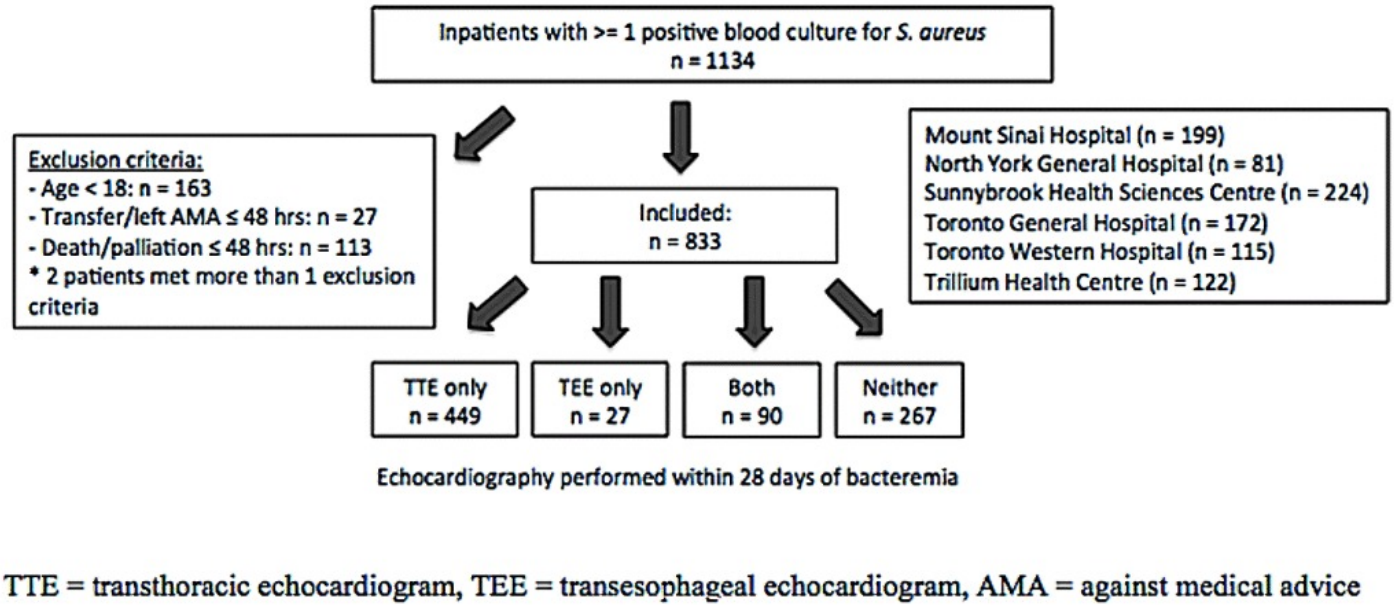

Fig. 1. Flow diagram of patients with Staphylococcus aureus bacteremia including type of echocardiography performed

We aimed to develop new guidelines to help doctors identify low-risk SAB patients, in whom the less invasive transthoracic echocardiogram (TTE) alone can rule out infective endocarditis.

We reviewed the medical charts of 833 hospitalized patients with SAB from seven hospitals in Toronto, Canada over a three-year period (2007-2010). Patients who received a TTE within 28

days of their SAB were randomly divided into 2 groups. In the first patient group, we identified medical conditions that were strongly associated with developing endocarditis, and used statistics to create a set of high-risk criteria. We then applied these same criteria to patients in the 2nd group to confirm the model's accuracy.

We found 4 high-risk criteria predicting which patients with SAB had infective endocarditis:

a TTE that showed signs of endocarditis, or was not conclusive
SAB contracted in the community, as opposed to in the hospital
intravenous drug use
a previous heart condition.

Forty-five percent of patients in our study met one or more of these 4 high-risk criteria. We determined that a normal transthoracic echocardiogram (TTE) correctly ruled out infective endocarditis in 99% of low-risk patients (those who met none of the 4 high-risk criteria). Applying our criteria eliminates the need for an invasive TEE in close to half of all patients with SAB and provides more efficient patient care.

Showler A, Burry L, Bai AD, Steinberg M, Bell CM, Morris AM

Publication

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