Thermonuclease Test for Same-Day Identification of *Staphylococcus aureus* in Blood Cultures

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We used a thermonuclease test to presumptively identify *Staphylococcus aureus* directly in blood cultures on the same day that a smear of the broth showed gram-positive cocci in clusters. There were no discrepancies between the identification of *S. aureus* directly from 250 blood cultures and identification by the tube coagulase test which was performed on the 18- to 24-h subculture isolates. These rapid results were clinically relevant and enabled physicians to make more timely and cost-effective decisions about antibiotic therapy.

A report of "gram-positive cocci in clusters" is a common preliminary report issued by the microbiology laboratory for positive blood cultures. This report is important because it suggests that the isolate may be *Staphylococcus aureus*. *S. aureus* continues to be a common, serious cause of sepsis in both immunocompromised and noncompromised patients and requires prompt and appropriate antimicrobial therapy (7). For the physician treating the patient, the knowledge that the culture is positive for a possible staphylococcus is complicated by the additional knowledge that the gram-positive coccus may be a member of the coagulase-negative group of staphylococci which are often skin contaminants. Weinstein et al. (7), in an analysis of 300 episodes of bacteremia and fungemia in adults, showed that of 163 blood cultures positive for *S. epidermidis* (i.e., coagulase-negative staphylococci), only 6% represented true septicemia and 94% were considered to be contaminants. The coagulase-negative staphylococci, moreover, made up the most commonly isolated group of organisms (32%) from the 500 positive cultures. In contrast, for the 91 blood cultures positive for *S. aureus*, 75% represented cases of true septicemia and 25% represented skin contaminants.

Our experience at Vanderbilt University Hospital has revealed that 30 to 50% of all isolates from positive blood cultures are coagulase-negative staphylococci (6). The isolates were predominantly false-positives. A telephone survey of five other medical centers confirmed that the phenomenon of endemic staphylococcal pseudobacteremia is widespread, especially in hospitals in which members of the house staff draw the blood cultures.

Physicians are therefore often faced with the dilemma of whether to treat their patients for a possible *S. aureus* septicemia or to wait until the following day to rule out the possibility that the isolate is a coagulase-negative staphylococcus and represents a skin contaminant. A rapid, direct test that gives dependable, same-day information directly from the blood culture broth would therefore be extremely useful to physicians.

In November 1983, we started using the thermonuclease test as described by Madison and Baselski (4) for rapid identification of *S. aureus* strains in blood cultures. The principle of this test involves the elaboration of the enzyme DNase by *S. aureus* cells. DNase production is a routine diagnostic procedure used in some laboratories to distingu
terococcus, pneumococcus, or group B streptococcus). Because a negative result is therefore not definitive for coagulase-negative staphylococci, only positive results should be reported as indicating S. aureus, whereas negative results should be reported as “gram-positive cocci in clusters; not S. aureus.”

This study confirms that the thermonuclease test described by Madison and Baselski (4) for same-day identification of S. aureus from blood cultures is a rapid, accurate, and easily performed procedure. The same-day information provided by this test enables physicians to make more timely and cost-effective decisions about antibiotic therapy.

LITERATURE CITED


