culture bottles to be processed would remain the same, but by this proposed definition each “set” would have its own built-in quality control: ie, a true-positive blood culture result requires that the culture from both sites sampled at the same point in time be positive for the same organism(s).

Finally, I wish to reemphasize the authors’ recommendation that blood cultures from IV catheters should never be used by themselves to diagnose bacteremia—for this purpose, catheter cultures must be coupled with a set of standard peripheral blood cultures.

Rolando Berger, MD, FCCP
University of Kentucky Medical Center
Lexington, KY

References


To the Editor:

We appreciate Dr. Berger’s comments regarding our review (November 2002) of blood cultures in the critical care unit. We agree with him that the incidence of anaerobic bacteremia has decreased in the past few decades. Nonetheless, some studies have demonstrated that the number of positive anaerobic cultures is not trivial and that the mortality rate associated with anaerobic bacteremia remains high. In a study of 281,797 blood cultures at the Mayo Clinic performed between 1984 and 1992, 920 of the organisms (3%) recovered were obligate anaerobes. Thus, many experts continue to recommend the routine use of anaerobic blood cultures. In fact, one such recommendation was made in the editorial accompanying the study by Ortiz and Sande, which was cited by Dr. Berger.

Although some experts agree with Dr. Berger’s suggestion that anaerobic cultures be used only when the clinical suspicion for anaerobic infection is high, this approach would obviously require prior communication between clinicians and the microbiology laboratory. At this time, the most cost-effective approach to the diagnosis of anaerobic bacteremia is unclear. In our institution and others, the cost of an anaerobic culture is the same as the cost of an aerobic culture, and many institutions continue to routinely perform anaerobic cultures. At the Mayo Clinic, a blood culture set consists of blood inoculated into two aerobic bottles and one anaerobic bottle (Franklin R. Cockerill III, MD; personal communication; February 27, 2003). In our own institution, when blood cultures are indicated, we typically order two sets simultaneously (ie, blood is drawn from two separate sites), and our laboratory inoculates blood from the first set into both an aerobic bottle and an anaerobic bottle. The second set is inoculated into two aerobic bottles. Both of these approaches increase the yield of blood cultures by culturing a large volume of blood in multiple bottles, without taking the risk of missing an anaerobic infection. Both approaches differ slightly from the recommendation we made in Table 2, but in principle they support our recommendation for the routine anaerobic culturing of blood. An added benefit of routinely performing anaerobic blood cultures is that some facultative aerobes grow faster in anaerobic media than in aerobic media.

Regarding Dr. Berger’s second point, we completely agree that to minimize the number of false-positive cultures, blood should be drawn from more than one puncture site. The optimal timing of these separate vascular punctures is unclear, although drawing blood from two or three sites within a 24-h period appears to be adequate to detect bacteremia in most patients. Although we have chosen to define blood culture sets differently from Dr. Berger, in principle it seems we are in complete agreement.

Ann Weinacker, MD, FCCP
Stanford University
Stanford, CA

Shirin Shafazand, MD, MS
The George Washington University
Washington, DC

Anaerobic Blood Cultures

Useful in the ICU?

To the Editor:

We read with interest the article by Shafazand and Weinacker (November 2002) concerning the utility and limitations of obtaining blood cultures in the intensive care setting. The article is both well-written and informative. The authors, however, failed to discuss the routine use of anaerobic blood cultures. While this topic is somewhat controversial, it deserves recognition.

As Shafazand and Weinacker indicated, blood cultures often are included in the assessment of the febrile hospitalized patient.
It is common practice to inoculate both aerobic and anaerobic media when blood is obtained from the patient for a culture. While the frequency of aerobic blood-borne infection has increased, the incidence of anaerobic bloodstream infection has declined, even as microbacterial techniques for detecting these anaerobic bacteria have improved.2,5

Anaerobic bacteremia that is considered to be clinically significant accounts for < 1% of anaerobic blood cultures.6,7 Since the majority of patients with positive anaerobic blood culture findings have clinical conditions in which anaerobes are known to be the causative pathogens, the patients are typically already being treated for their anaerobic infection.7

The mortality associated with an anaerobic bloodstream infection is high. Lower death rates have been documented in bacteremic patients with anaerobic infections who have undergone surgical interventions.8,9 However, therapy with antibiotics alone, based on the results of anaerobic blood cultures, offers little survival advantage unless surgical intervention can be performed.9 Thus, some investigators9,10 have suggested that the identification of an anaerobic pathogen by blood cultures seldom alters the antimicrobial treatment or favorably influences outcome. These observations have led some researchers9,10,11 to propose that the selective performance of anaerobic blood cultures, based on the patient’s risk for anaerobic infection, may be more appropriate than the practice of obtaining routine anaerobic blood cultures.

Despite these observations, there is unwillingness in the medical community to alter the current practice of obtaining anaerobic blood cultures. The most compelling reason for this reluctance is that most clinically significant aerobic bacterial pathogens are facultative anaerobes. Continuing the practice of obtaining both aerobic and anaerobic blood cultures, therefore, in effect doubles the volume of blood cultured and may, thereby, increase the isolation of these facultative organisms. Moreover, there are some pathogenic organisms that are classified as facultative anaerobes that grow more quickly in anaerobic conditions. Thus, blood cultures for these organisms may be positive earlier or only positive in the anaerobic blood culture bottle.11

We hope that this information will complement the review article by Shafazand and Weinacker, and stimulate further investigation into the utility of anaerobic blood cultures in the critically ill patient.

Ryland P. Byrd, Jr, MD, FCCP
Thomas M. Roy, MD, FCCP
East Tennessee State University
Johnson City, TN

REFERENCES
8 Bouza E, Reig E, Garcia de la Torre M et al. Retrospective analysis of two hundred and twelve cases of bacteremia due to anaerobic microorganisms. Eur J Clin Microbiol 1985; 4:262–267

To the Editor:

We thank Drs. Byrd and Roy for their comments on our review of blood cultures in the critical care unit,1 and we agree with them completely. We did not discuss the use of anaerobic cultures in our review, but in Table 2 we recommended routinely obtaining both aerobic and anaerobic cultures. It is true that this is a controversial area, and that some experts no longer recommend routinely obtaining anaerobic cultures. However, for all of the reasons cited by Drs. Byrd and Roy, we disagree with that practice and routinely obtain anaerobic cultures. In our institution, we typically order two sets of blood cultures to be drawn when blood cultures are indicated. This consists of 20 to 30 mL of blood drawn from each of two separate sites, and then inoculated into one aerobic bottle and three aerobic bottles. If, for some reason, only one set can be obtained, the blood is inoculated into one aerobic and one anaerobic bottle. We believe this increases both the yield and efficiency of blood cultures. Like Drs. Byrd and Roy, we hope that this discussion will stimulate further research in this area.

Ann Weinacker, MD, FCCP
Stanford University
Stanford, CA
Shirin Shafazand, MD, MS
The George Washington University
Washington, DC

REFERENCE