Bacterial Culturing of Sterile Body Fluids Using the VersaTREK® Automated Blood Culture Instrument

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ABSTRACT

Normal sterile body fluids that become infected with bacteria may result in severe morbidity and mortality, but unlike CSF, the variety of bacteria recovered from infected pleural, pericardial, peritoneal or pericardial fluids is more extensive. For culture detection procedures, the most common method is to inoculate samples into an aerobic and anaerobic blood culture bottles. In our institution, we have noted a high percentage of positive blood culture bottles in body fluid specimens. In this study, we compared the performance of two methods: blood culture bottles (Con培养; matrix) and blood culture bottles with concomitant solid media cultures (VersaTREK®). The VersaTREK® system uses a standardized algorithm for sample collection, distribution, and processing. Of all the organisms recovered, 50% were from blood cultured bottles, while 25% were obtained from solid media cultures. This study demonstrated that the VersaTREK® system is more sensitive than the blood culture bottles alone.

INTRODUCTION

For descriptive and etiologic purposes one can divide the body into compartments or body spaces. These spaces are lined with mucous membranes and contain a small amount of sterile fluid that serves to function as a barrier between the environment and body space. When this barrier is disrupted, injury occurs, and the cells of the surrounding membranes become infected through hematogenous seeding of bacteria, enter by the urinary tract, or are introduced during a surgical procedure. Bacterial etiologies of sterile body fluid collections are complex, and frequently these patients have concurrent positive blood cultures. The collection of body fluid samples requires stringent aseptic procedures and is frequently a time-consuming process. Specific locations are sampled, depending on their clinical significance and patient age. Bacterial organisms are present in the oropharynx, nasopharynx, and conjunctiva. Most are transient, and the number of microbes decreases with age. Bacterial colonization of the skin is minimal in the neonatal period. Infants acquire skin microflora early in life. 

RESULTS

Five-month-old fluid samples were collected from all different patients. Of these, 45 were sterile by both methods; two grew aerobic mesotheric flora, while Staphylococcus aureus was recovered from the third sample. Five samples were positive in blood cultures only: Staphylococcus epidermidis, Propionibacterium acnes, Coagulase negative staphylococci, and Klebsiella pneumoniae. Nine samples were positive in solid fluid cultures only. Enterococcus faecalis was recovered from three samples. In the remaining 11 samples, both methods were negative. Concordant culture results were obtained with three additional samples: Enterococcus faecalis, Staphylococcus epidermidis, and Propionibacterium acnes. The two remaining blood culture bottles prior to use, an observation that speaks to the enriched media formulations in the VersaTREK® bottles, and clinical intervention, only two of the VersaTREK® bottles were positive in all four instances, whereas three of the solid media cultures from these samples were positive.

We cultured 175 body fluid samples using a standardized algorithm for sample collection, distribution, and processing. Of all the organisms recovered, 50% were from blood cultured bottles, while 25% were obtained from solid media cultures. This study demonstrated that the VersaTREK® system is more sensitive than the blood culture bottles alone.

REFERENCES


