Validation of Performance of Plastic versus Glass Bottles for Culturing Anaerobes from Blood in BacT/ALERT SN Medium

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Received 26 September 2005/ Accepted 27 September 2005

To validate performance, we compared the new plastic BacT/ALERT (bioMérieux, Durham, NC) SN bottle to the current glass SN bottle with samples of blood obtained for culture from adults and found them comparable for both recovery and speed of detection of microorganisms. We conclude that the safety advantage of plastic bottles can be achieved without compromising performance.

Both aerobic and anaerobic blood culture media are commonly used to detect microorganisms from the blood of adult patients with suspected bloodstream infection. bioMérieux, Inc. (Durham, NC) has reformulated its anaerobic standard culture medium in a clear plastic bottle for use in the BacT/ALERT blood culture instrument. The design of this plastic bottle is similar to that described by Snyder et al. for an aerobic standard SA medium (6) and Petti et al. for the adult aerobic FA (4) and pediatric PF (5) media. These plastic bottles with a repertoire of media were designed to eliminate breakage of glass bottles and thereby to minimize potential safety hazards.

The new plastic SN (PSN) bottle contains a casein-soy-based medium similar to that in glass SN (GSN) except for formula modifications that include addition of yeast extract, pyridoxine HCl, and sodium pyruvate. The bottle has a smaller stopper and contains a modified liquid emulsion sensor to reduce the risk of false-positive bottles. To assess the result of these changes, we compared the new PSN bottle to the existing GSN bottle when used in conjunction with an aerobic SA bottle for both the recovery of microorganisms and the time to detection of the growth in samples of blood obtained from adults with suspected bloodstream infection.

(This work was presented at the 103rd General Meeting of the American Society for Microbiology, Washington, DC, 19 May 2003, abstract C-003.)

Blood was collected from adults with suspected bloodstream infection who presented to Duke University Medical Center from April through December 2002. Institutional review board approval was obtained prior to the study, and all blood cultures were performed as part of standard patient care. Thirty milliliters of blood was obtained by venipuncture, and 10-ml aliquots were distributed into aerobic SA and anaerobic PSN and GSN bottles. Upon receipt in the laboratory, each bottle was visually compared to bottles of the same composition and contained a modified liquid emulsion sensor to reduce the risk of false-positive bottles. To assess the result of these changes, we compared the new PSN bottle to the existing GSN bottle when used in conjunction with an aerobic SA bottle for both the recovery of microorganisms and the time to detection of the growth in samples of blood obtained from adults with suspected bloodstream infection.

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Of 5,323 anaerobic bottles received, 3,652 (69%) met the adequacy criteria, which is comparable to previous reports (4, 5). There were 357 isolates positive in one or both adequately filled bottles. Of these 357 isolates, 240 clinically significant microorganisms were isolated from 205 patients. Of the 240 isolates, 30 were fungi and 14 were aerobic gram-negative rods (e.g., Pseudomonas aeruginosa, Acinetobacter baumannii, and Stenotrophomonas maltophilia) that one would expect to isolate preferentially from an aerobic bottle (2). Therefore, we omitted these groups of microorganisms from further consideration to emphasize the relative performances of PSN and GSN for anaerobic and facultative bacteria. Overall, clinically significant isolates, including strict anaerobes, were detected with equal frequencies in both study bottles (Table 1). The relative paucity of anaerobes is in accord with trends of recent decades at similar centers (2). There were 136 isolates recovered from both PSN and GSN bottles within 5 days, and the mean times to detection (Table 2) were similar in both bottles (for PSN, 16.4 h; for GSN, 17.9 h). Among the 3,652 adequate paired blood culture bottles, there were 27 false-positive bot-
We thank the staff of the Clinical Microbiology Laboratory at Duke University Medical Center.
This work was supported by a grant from bioMérieux, Inc., Durham, NC.

REFERENCES