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Sterile body fluid culture using blood culture bottles is superior to direct fluid culture for identification of pathogens

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Background: The traditional procedure for body fluid cultures includes fluid inoculation on routine media. In addition, some centers inoculate blood culture bottles. This study assessed the accuracy and agreement, and total recovery of clinically significant bacterial organisms from body fluids compared to the traditional methods.

Materials & Methods: Three years of retrospective data was reviewed for body fluid specimens in which a blood culture bottle was submitted in addition to the standard fluid for routine culture. Blood bottles were incubated on the BACTEC 9000 instrument (Becton Dickinson) for five days or until growth was detected. For cultures using routine media, blood, chocolate and MacConkey agars and thioglycollate broth were inoculated, incubated at 37°C in 5% CO2 and examined daily for three days.

Results: Results were compared between the two methods for the presence of pathogens and likely contaminants. Specimens (n=468) were examined and results were compared and categorized as follows: (1) Concordance: 440 (90.5%); (2) No correlation (different organisms identified by each method): 6 (1.2%); (3) Pathogens detected by one method only: bottles: 30 (6.2%) vs. routine: 10 (2.1%); p for difference=0.0018; OR=3.42 (95% CI=1.52- 6.52); (4) Contamination rate: Blood bottles: 1% (5/440) vs. Routine culture: 0.4% (2/440); p for difference=0.2780; OR=2.62 (95% CI=0.51-13.59).

Conclusion: Both methods showed a high correlation, but blood culture bottles allowed for isolation of more significant pathogens than routine culture while not showing an increase in the detection of likely contaminants. The increased sensitivity can likely be attributed to the larger volume of specimen inoculated into the bottle and a more optimal nutritive environment. Our data suggest, utilization of blood culture bottles in sterile body fluid cultures should be the preferred method of detecting pathogens.

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