Anaerobic Blood Culture Media Change Increases Isolation of Anaerobic Blood Stream Infections

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ABSTRACT

Objectives To study whether a switch to anaerobic blood culture media would improve isolation of anaerobes.

Methods Methods: Blood culture media switch occurred on 2/17/2011. All obligate anaerobes isolated for 12,453 blood cultures collected prior to and after the isolation of anaerobes were BACTEC Lytic and BacT/Alert FN. In vitro data has demonstrated that BACTEC Lytic has faster time to detection for anaerobic organisms than does BacT/Alert FN media [4]. Our hospital changed from BacT/Alert FN media to BACTEC Lytic anaerobic media in 2011. In this study, we aim to identify differences in isolate of obligate anaerobes prior to and after the switch of the media and describe the clinical scenarios of the positive cultures. There is a paucity of data on whether different anaerobic media can affect clinical decision making, and this study aims to facilitate the acquisition of this data in the future.

METHODS AND MATERIALS

All blood cultures obtained hospital wide prior and after the media switch were evaluated to identify isolates of anaerobic pathogens. Two time periods were compared: 1) 2/1-2/10/2010 and 2) 2/11-3/31/2011. The control period was 2/1-2/10/2010 and the intervention period was 2/11-3/31/2011. The most commonly isolated anaerobic bacteria were Bacteroides sp, Clostridium sp, and Fusobacterium sp. The study was a non-randomized, retrospective study. The analogen groups were: 1) all blood cultures collected between 2/1-2/10/2010 or 2) all blood cultures collected between 2/11-3/31/2011. The primary outcome was whether the switch to BACTEC Lytic anaerobic media facilitated the acquisition of the anaerobic isolates and the secondary outcome was to identify any differences in the clinical presentation of the patients.

RESULTS

All blood cultures obtained hospital wide prior to 2/11/2011 were collected into BACTEC Lytic and BacT/Alert FN media and BacT/Alert FN media. After 2/1/2011, all blood cultures were collected in BACTEC Plus Anaerobic and BACTEC Lytic anaerobic bottles. Blood culture ordering, processing, or recommended volume of collected blood per manufacturer's media was not changed. All cultures isolated exclusively in the anaerobic media for 2 years prior to the media switch and 2 years following media switch (2/1-2/10/2010 and 2/11-3/31/2011) were reviewed. Only obligate anaerobes were included in the study. Overall culture positivity, differences in isolation of obligate anaerobes across the 2 study periods, and individual obligate anaerobe species isolated were evaluated. All Porphyromonas sp isolates were included as contaminants and therefore excluded from the analysis. Their inclusion would have overestimated any potential clinical effect seen. Contamination rates were calculated to insure differences in yield were not due to increased contamination.

DISCUSSION

After the change in blood culture media from BacT/Alert FN to BACTEC Lytic, there was an increase in overall bacterial isolation and obligate anaerobe isolation. Anaerobe isolation nearly doubled (1.8% to 3.2%) but not at the expense of contaminants, as this rate remained flat. There was no statistical difference in specific organism identification between the two time periods. There were no changes in isolation of common anaerobic bacteria, but there was an increase in overall culture positivity when identified clinically or by microbiology laboratory. The anaerobic blood culture media has antimicrobial removal components, eliminating this as a possible confounder. No significant differences in patient characteristics were identified that could explain the differences in the findings, suggesting there may be some property inherent to the BACTEC media which facilitates anaerobe growth. The most commonly isolated organisms include the Bacteroides, Clostridium and Fusobacterium genera, which are likely pathogenic to humans. With the change in media, different organism families were identified, suggesting the BACTEC media facilitates isolation of more fastidious anaerobes. It is not known if these findings translate into a difference in mortality, length of stay, or clinical practice. Further study is required.

CONCLUSIONS

With institution of the BACTEC Lytic medium there was:

- An increase in overall culture positivity over the study period
- A doubling of the obligate anaerobes isolated (1.8% vs 3.2%)
- Clinical diagnosis of the affected patients were similar throughout the study period, excluding this as a confounder.

REFERENCES