Reviewer’s report

Title: Data correction preprocessing for electronically stored blood culture results: Implications on microbiological spectrum and empiric antibiotic therapy

Version: 1 Date: 17 March 2009

Reviewer: Stefan Riedel

Reviewer’s report:

The manuscript entitled “Data correction preprocessing for electronically stored blood culture (BC) results: implications on microbial spectrum and antibiotic therapy.” Is a nicely conducted study reviewing the problems of interpretation of blood culture results. The authors compared two different methods to adjust raw data and compared the impact of these adjustments to using a raw data set, only. The authors concluded that the CFM method used the best clinical interpretation pattern compared to the other methods; however, none of the evaluated methods would correct for change in empiric therapy.

I would like to make the following suggestions for revisions in order to improve this manuscript:

Major compulsory revisions:

1. On page three (3), third line from the bottom, the authors reference a publication by S. Richter et.al. regarding “Minimizing the workup of blood culture contamination”, (J Clin Microbiol 2002; 40: 2437-2444). In the preceding paragraph the authors address the impact of blood culture results and reporting with regard to the (empiric) treatment options for patients. However, this reference is a focused study of evaluating BC for possible contaminants and suggestions to then minimize the workup of certain organisms in BC based on their laboratory algorithm. During the following paragraph the authors discuss BC contamination in more detail. I suspect that reference 4 has been misplaced and should have been noted within the following paragraph.

2. Figure 1 describes a “flowchart” for the raw data method (RDM). As this method is well explained within the Methods section of the text, I believe that this figure does not add any substantial information or contribution to better understanding this particular data assessment method. I suggest eliminating figure 1 from the manuscript.

3. The authors describe within the results and discussion sections the impact of all three data assessment methods on the evaluation of BC contamination. These data are presented well and the tables are fully conclusive. However, table 1 includes an analysis of frequency of organisms encountered in all BCs included in this study. Table 1 mentions 333 “other organisms”. The manuscript does not further specify what other organisms were encountered (page 10 under results). I suggest that the text should mention what other organisms (e.g. descriptive grouping) were seen.
4. On page 8, the authors describe the duplicate free and the contaminants free methods (DFM, CFM). Please describe in more detail the criteria for the DFM, as similar antimicrobial susceptibilities, even with the disclaimer of 85% similarity, do not conclusively proof that those are duplicate isolates. In addition, the authors should discuss the impact of using this method. In many ways, “duplicate isolates” of organisms with different antimicrobial susceptibilities could suggest an emerging change and may warrant notification of physicians. On the other hand, in developing antibiograms, CLSI guideline M 39-A2 sets forth definitive criteria for excluding certain isolates for the purpose of cumulative antimicrobial susceptibility analyses.

5. On page 8, for the description of the CFM, the authors mention alpha-hemolytic streptococci. I would discourage the use of this term, as it may include some enterococci as well as VGS. Enterococci are considered true pathogens. This issue is further discussed in manuscripts reference 4 (S. Richter et al. regarding “Minimizing the workup of blood culture contamination”, J Clin Microbiol 2002; 40: 2437-2444).

6. With the regard to the associations of empiric therapy and antimicrobial susceptibilities, the authors must consider that the difference for the CFM method for fusidic acid, while an interesting observation, is not relevant to the topic of this discussion. A revision of the results should either contain data that describe the commonly used antimicrobials for the treatment of blood stream infections (BSI) in the authors’ institution, or should reflect a true antibiogram considering the approved antimicrobials for the treatment of BSI. This information is available in the M100 S19 Clinical and Laboratory Standards Institute (CLSI) manual for performance standards of antimicrobial susceptibility testing. Similar standards are published by the European Society for Microbiology and Infectious Diseases. In this regards, the evaluation of antimicrobials such as fusidic acid, fosfomycin, and trimethoprim adds little information to the issues discussed in this manuscript.

7. In addition to the revisions in figures 4 and 5, I suggest to include the following reference to the discussion of the data: Munson et al. Journal of Clinical Microbiology 2003; 41: 495-497. This publication describes the fact that very little changes occur in the antimicrobial management at the time when antimicrobial susceptibility results are available to physicians. This would add an interesting point of discussion to this manuscript and further underscore the importance of antibiograms in the empiric choice of antimicrobials. I suggest that the authors expand on this issue in their discussion of the data.

Minor essential revisions:

The following “minor” corrections are essential are those are of grammatical and/or context nature to allow for a better understanding of the manuscript. I will also mention a few minor spelling mistakes.

8. Table 2: In the comparison of RDM vs. CFM as well as DFM vs. CFM the p-value for S. epidermidis shows “>0.0001”. I believe that this should read “<0.0001” as this means statistically significant.
9. Page 3, line 7: please correct to “….testing results, pharmacokinetics of the drug…”

10. Page 3, line 10: please correct to “…Contrarily, in clinical settings, microbiological…”

11. Page 6, line 11: please eliminate “an” before administration tools

12. Page 6, line 16: correct “b)” to “c)”

13. Page 7, line 4-15: please reword these sentences, as to better reflect which methods are compared in what manner. Also, line 7 reads at present time “….tree separate queries…”. I believe that this should read as “three”.

14. Page 7, line 18: please correct the sentence to better reflect the way antimicrobial susceptibilities were assessed: e.g. “… and antimicrobial susceptibilities, using interpretive criteria (susceptible, intermediate, resistant) as defined by CLSI”. One can reference the M100 S19 at this point.

15. Page 12, line 21: please add the word “true” before bacteremia.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.