Reviewer’s report

Title: Systemic Inflammatory Response Syndrome in Adult Patients with Nosocomial Bloodstream Infections due to Enterococci

Version: 1 Date: 22 July 2006
Reviewer: William E Trick

Reviewer’s report:

General comments
The authors performed a historical cohort study of patients who have monomicrobial enterococcal bloodstream infection. They compared outcomes for patients who have vancomycin-resistant enterococcal BSI to those who have a vancomycin-susceptible infection. This is an extremely important question from the perspective of patients, clinicians, hospitals, healthcare systems, and public health. Strengths of the paper include their attention to measuring severity of illness; they measured the APACHE II and SIRS scores from Day-2 to Day 14. The manuscript is limited by the low number of monomicrobial bloodstream infections--it is difficult for one center to accumulate a sufficient number of cases to reliably adjust for other clinical characteristics. Also, as the authors acknowledge, enterococcal species was associated with vancomycin resistance (E. faecium) or susceptibility (E. faecalis), and species may be associated with patient outcome. Because of these limitations, from this paper, it is difficult to draw meaningful conclusions about the impact of vancomycin resistance on clinical outcomes.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

General
Information is lost in converting the APACHE II score from a continuous to a dichotomous outcome. The decision to use a cut-point and reason for the value chosen should be included.

Were all of the BSIs primary or were secondary infections included? As the authors are aware, this distinction likely is important in assessing patient outcomes.

The culture day should be defined. In some situations the date the culture was obtained is most relevant (e.g., evaluating the association between infection and clinical state), while for others (e.g., physician choice of antibiotics) the date of the culture result may be most relevant. In this paper, what was Day 0?

Did the authors only evaluate in-hospital mortality? If so, were patient discharges within 7 days censored from the analysis of 7-day mortality?

Abstract
The Methods section describes the focus of the paper as defining the systemic inflammatory response syndrome (SIRS). However tables 1 and 2 compare VRE to VSE and table 3 looks at predictors of mortality. Also, the results describe a spectrum of illness that includes septic shock and death in addition to SIRS. Perhaps the analyses could focus on the progression of SIRS among patients or the methods could reflect the range of outcomes assessed. The last sentence should define the dependent variable for the multivariable analysis.

In the results, APACHE II cut-point of 20 is reported, which is inconsistent with the results displayed in the body of the manuscript.

Background
The last sentence should be reworded. Currently, as worded, the relationship being assessed is unclear to me.

Methods, Definitions
Third sentence. SIRS is defined as two or more clinical criteria, which is consistent with definitions used by other investigators; however this outcome does not appear to be used in the analyses. Figure 1 displays all possible SIRS scores. It would help the reader for the authors to state in the methods how the SIRS scores...
were to be used in the presentation of data. Also, sepsis is defined but does not appear to be used in the analyses. In summary, the clinical states relevant to the results presented should be clarified.

Methods, Statistical analysis
Please clarify the outcome assessed for your models.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Methods, Study Design
I recommend that the clinical conditions SIRS 0 through septic shock be explicitly stated as mutually exclusive categories and that SIRS 1 through SIRS 4 represents the sum of the clinical criteria used to score SIRS.

The last sentence may more clearly state the study objective.

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Discretionary Revisions (which the author can choose to ignore)

Discussion
Last paragraph, second sentence. The underlying clinical state was significant in determining outcome. Do the authors mean baseline rather than underlying?

Table 1
Typo in the third column â€œVSEâ€ should be â€œVREâ€.

I think the APACHE II scores should be analyzed as a continuous score.

Iâ€™m not sure the last two columns (stratification by APACHE II score) add much to the paper and the authors should consider omitting these columns. I recommend inclusion of a column that displays 95% confidence intervals.

Table 2.
Overall mortality should be clarified as in-hospital mortality. The point estimate for the absolute difference in overall mortality between VSE and VRE likely is clinically meaningful. I think the confidence intervals should be included.

Figure 3
Rather than displaying the daily state (death is final, where as patients could go into and out of the clinical state of severe sepsis or septic shock), the authors should consider displaying these data as a survival curve. Perhaps they could adjust for severity of illness by constructing a proportional hazards model.

What next?: Accept after minor essential revisions

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:
I declare that I have no competing interests