Reviewer's report

Title: Procalcitonin and procalcitonin kinetics for diagnosis and prognosis of intravascular catheter-related bloodstream infections in critical care: a prospective observational study

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Reviewer: Leonard Mermel

Reviewer's report:

This manuscript is well written. The major strength is you were investigating the utility of this biomarker to assist in diagnosing and managing patients with CRBSI which few other investigators have done. However, a major weakness is that your determination of the accuracy of this biomarker, and its utility regarding CRBSI, is limited because the control group were patients with the absence of any other infection. Thus, within the confines of your study population, the PCT appears to be a valuable adjunct for CRBSI but in the ICU, patients have fever from all sorts of infectious and non-infectious etiologies and since you excluded patients with infection at ICU admission or during their ICU stay, it is difficult to extrapolate the findings of your study to the day-to-day management of complex patients, many of whom have fever of uncertain etiology in the ICU. As such, it is important to add some comments in this regard to the Discussion section where you discuss limitations noting that the true accuracy of PCT in ICU patients with CRBSI awaits the findings of future studies which do not exclude patients with known or suspected infection due another etiology.

Specific comments:

Page 6 - The first full paragraph of the page you note that you are not aware of prior studies of PCT and CRBSI in the ICU setting. Were any patients in references 27 or 28 in the ICU?

Page 12 - Discussion. As above, it is important to note the limitation of your study, namely the lack of a comparative group having fever due to other etiologies. Without this comparison, it is difficult to extrapolate from findings of your study to the ICU physician trying to determine which of the febrile patients has a CRBSI versus an alternative source of fever.

Page 13 - At the top of the page, you note the rise in PCT suggesting imminent CRBSI. But again, as noted above, the same might happen in a patient with abdominal infection some days after surgery or maybe a patient who has a bladder catheter and is transitioning from colonization to true infection. Thus, although the rise of PCT in your study predicted CRBSI, this specificity of that finding is unknown because the context of your study (ie, using a control group of patients without infection) which is vastly different from managing patients in the ICU. Lastly, it would be interesting to know if there are patients who had a rise in
their PCT prior to suspected CRBSI but in whom CRBSI was disproved. Were such patients observed in this study, and if so, what was the ultimate diagnosis to explain the rise in PCT?

Page 23-It is unclear if Table 1 is of seminal importance for the manuscript and it could possibly be deleted. Additionally, ICU Length of Stay at the bottom of Table 1 is not a characteristic on admission as stated in the title of the table.

Page 25- Table 3 could be omitted by including the etiology of proven CRBSI text.

Figures 2 and 4 are similar to some of the data in tables and those figures could be deleted or the tables showing similar data deleted, including similar data in tables and figures is unnecessary.

**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:**

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Consultant: Angiotech, Bard, Catheter Connections, Fresenius, ICU Medical, Semprus, Teleflex