Author’s response to reviews

Title: Do Bacteremic Patients with End-Stage Renal Disease Have a Fever When Presenting to The Emergency Department? A Paired, Retrospective Cohort Study.

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Meng-Chieh Wu, M.D. (Reviewer 1): It's a good idea to evaluate fever or not for hemodialysis patients at triage of emergency department. But I had some suggestions:

1. The number of patients was small.

We agree that the sample size is a limitation of our study. We added a comment about sample size to limitations section (page 13).

2. How did you choose 37 non-hemodialysis patients? The residual patients with blood culture that grew MSSA or MRSA was 89%. How did you used a random number generator?

We chose to study 37 non-hemodialysis patients in order to conduct a cohort study matched for sex and age, as both sex and age have been shown to be associated with fever response (Gleckman et al., 1982; Mackowiak et al., 1992).

We first determined which of the 428 patients with MSSA or MRSA-positive blood cultures were on chronic hemodialysis by reviewing the medical record. We separated the 48 patients from the remainder. We then used the random number generator function in Excel to assign each of the remaining 380 non-HD patients a random identification number. We then sorted this group of 380 by the random identification number. We included the first person on the randomly sorted list in the study if their sex and age (within 10 years) matched that of the person on the HD list. If the sex and age did not match, we included the next person on the randomly sorted list (and so on).
3. In this study, 54% hemodialysis patients did not have a detectable fever at ED triage. However, the patients maybe suffer from fever at home or hemodialysis unit. The data maybe consider to compare previous history of temperature and fever before patients arrived at ED triage

We agree that patients may have suffered from fever at home or in a hemodialysis unit prior to presentation, but we believe that the presence of fever at triage is more clinically useful. This is because ED providers are often time-limited and unable to conduct a thorough chart review and must depend on vital sign abnormalities upon arrival in the ED in order to make quick and life-saving clinical decisions, such as starting a bacteremic patient on antibiotics. Of note, we found that a chief complaint of fever or chills, perhaps a proxy for fever prior to ED presentation, was associated with fever at triage.

Jun Xu (Reviewer 2): In this study, it is interesting that authors investigated whether bacteremic patients with end-stage renal disease have a fever when presenting to the emergency department, compared the HD group and non HD group on fever incidence and explored the reason of the difference. However, several problems are as follows:

1. The important information of this article is that "more than half of patients were without detectable fever at triage. Absence of fever at presentation to the Emergency Department should not delay blood culture acquisition in patients who are at increased risk of S.aureus bacteremia", which has clinical significance. It should be focused on.

Please see page 11 for further explanation of the clinical significance.

2. In the result, "triage temperatures were 100.5°F (95% CI 99.9-101.2°F) and 99.0 F (95% CI 98.4-99.6°F) in the hemodialysis and non-hemodialysis cohorts, respectively (p&lt;0.001)", How to explain the significant different?

As described in paragraph 1 of the Discussion section (page 10), the reason for this significant difference is unclear. One plausible explanation, as discussed, is that hemodialysis raises basal body temperatures, either secondary to chronic inflammation or a hemodynamic response to dialysis.
3. How to determine the sample size?

During the study period (1/1/15 – 12/31/17), there were 428 patients with MSSA or MRSA-positive blood cultures. 48 of these patients were on chronic HD. 11 HD patients were excluded from the study (see page 7 for details), leaving 37 HD patients remaining in our sample.

We chose to study 37 non-hemodialysis patients in order to conduct a cohort study matched for sex and age, as both sex and age have been shown to be associated with fever response (Gleckman et al., 1982; Mackowiak et al., 1992).

4. In the conclusion, the sentence "possibly reflecting use of insensitive methods for measuring temperature", but lack of data supported central thermometers were more sensitive than peripheral in this study. Even so, is the central thermometers applied universally in ED triage?

To our knowledge, central thermometers are not currently used universally in ED triage. Our study raises the question of whether central thermometers should be a new standard of care in ED triage, as central thermometers are more sensitive and accurate at detecting fever.

5. What's the result of the HD patients' temperature at baseline compared to ED triage temperature in No HD group?

HD patients had an estimated mean temperature of 98.0°F (95% CI 97.7-98.2°F) at baseline. The estimated mean ED triage temperature in the No HD cohort was 99.0°F (95% CI 98.4-99.6°F).