Reviewer's report

Title: Available, Bed-sided, Comprehensive (ABC) Score to A Diagnosis of Methicillin-Resistant Staphylococcus aureus Infection: A Derivation and Validation Study

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Reviewer: Shey-Ying Chen

Reviewer's report:

This manuscript developed and validated a scoring system to differentiate between infection and colonization among hospitalized patients with positive MRSA culture. It is important for first-line physicians in their decision in appropriate use of anti-MRSA antibiotics. However, some aspects and limitations prevent this manuscript from being published in current style.

Major comments for author:

1. The predictors and assigned score point in the provisional ABC score were arbitrary and were not assessed by appropriate statistical methodology. Though the authors provided a revised score by recruiting new predictors, the decision of selecting predictors in final model by sensitivity/specificity/diagnostic concordance > 50% criteria was inappropriate and introduced the risk of model over-fitting problem. Also, the author should provide reference how they translated kappa value to score point in this study. Why 1 point for a kappa coefficient ranging from 0.01 to 0.41 but not 0.01 to 0.40.

2. Isolation of MRSA from aseptic sample such as blood, ascites, pleural effusion, or spinal fluid should be considered as an invasive MRSA infection and needs prompt anti-MRSA antimicrobial therapy. These patients need not and should not be determined their infection status by any scoring system in order not to mislead antibiotics treatment decision. I could not image a MRSA endocarditis patient without significant systemic inflammatory response but has persistent bacteremia might be judged as "colonization" by the revised ABC score in this study. Therefore, those patients with MRSA culture from aseptic sample should be excluded from this study.

3. To avoid misclassification, colonization or active infection of a patient with positive MRSA culture from non-sterile sample (sputum, wound, urine, and upper airway) was best judged by two independent ID doctors who were blind to the result of ABC score. A
third ID doctor's decision will be need if the first two ID doctors have discrepancy in their judgement.

4. I worried about the consistency of the diagnosis of active MRSA infection of study patients in the derivation and validation phase. In derivation phase, 26 out of 172 patients (15.1%) had undifferentiated infection (undetermined infection status?) judged by one ID doctor. However, in the validation phase, none of the 154 cases were judged as undifferentiated infection. I am not sure if patients with undifferentiated infection were excluded in validation phase. If so, this might introduce selection bias and falsely increased the predictability of the revised ABC score as assessed by AUC.

Minor comments for authors:

1. I suggest using criteria for systemic inflammatory response syndrome (SIRS), including HR, RR, BT and WBC count, as the definition of "systemic inflammatory response" in this study. It is well recognized and accepted in the definition of so-called systemic inflammation.

2. In page 6, line 87, the word should be corrected to "In the derivation phase, all consecutive patients admitted to the hospital from May 2010 to April 2011 with any positive culture for MRSA during hospitalization were enrolled in the study". It is because the authors did not enrolled patients without positive MRSA culture in this study.

3. I would like to suggest to change "undifferentiated infection" to "undetermined infection status" or "unknown clinical significance" of MRSA culture.

4. The manuscript should be edited by a native English speaker before formal publication.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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