Reviewer's report

Title: Clinical outcomes associated with Staphylococcus aureus and Pseudomonas aeruginosa airway infections in adult cystic fibrosis patients

Version: 2
Date: 9 April 2015
Reviewer: Anne Costello

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

1. Given that this paper compares the outcomes of PA infection and SA infection the grouping together of the ‘PA + SA’ group and the ‘PA only’ group to form one PA group should be justified. Only in the event that all of the clinical outcomes for both of these two groups are comparable can it be justified to combine them into one single PA group. If the scores for each group are indeed comparable then that should be noted in the manuscript, at the very least, with reference to data not shown. However, if there are any perceived differences in any of the clinical outcomes for the ‘PA only’ and the ‘PA + SA’ groups then these two groups should be treated as separate for all analyses. In this case, if the PA + SA group is too small to constitute a reliable representation of PA + SA infection then it should not be included at all.

2. Tables 2, 3, 4 + 5 contain various statistical analysis comparing regression coefficients, within certain 95% confidence intervals (Tables 2, 4 + 5) or poisson distribution (Table 3) of infection status vs disease outcomes of the different infection status groups. For these analyses the PA group is used as a reference in comparison to the ‘SA’ and ‘no PA/SA’ groups. While this approach determines the difference in disease status between the groups it artificially assumes that there is no correlation between PA infection and disease status. Eg, Table 2 sets the PA group as a reference, with a regression coefficient of ‘0’, for analysis of the association between infection status and FEV1%. Although it is clear that this is done for the purposes of comparison, it assumes that there is no correlation between PA infection and FEV1%. This is misleading. Using the ‘no PA/SA’ group as the reference for the SA and PA groups would be more acceptable and would give a much clearer picture of the disease outcomes of SA vs PA infection. Graphical representation of the data would be appropriate here.

3. The data presented shows only that patients with SA infection have a more favourable clinical outcome than those infected with PA. The last sentence of the conclusion makes an inference that there may be an inhibition interaction between SA and PA which affects the clinical outcome. There is no data in this manuscript which supports the possibility of inhibition of PA by SA. If an inference is to be made that such an interaction may be responsible for the milder clinical outcome in adults with SA versus PA, as is reported here, it should
at the very least be supported with reference to relevant co-infection publications.

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

1. Background, paragraph 1, sentence 2, last word ‘organism’ should be pluralised to ‘organisms’ as referring to both SA and PA.
2. Background paragraph 1, sentence 3 begins with ‘PA is the…’. Change to ‘PA, the…’ OR change ‘infects’ to ‘infecting’ later in the sentence to correct grammar.
3. Background paragraph 2, sentence 4: The term ‘greater’ is incorrect in this context. ‘Increased’ or ‘elevated’ would serve better here.
4. Background paragraph 2, sentence 5: Replace ‘their’ in “but, their routine use” with ‘its’. The possessive of ‘antibiotic therapy’ is singular not plural.
5. Study design, sentence 1: replace ‘and’ in “and alive in January” with ‘who were’ to correct grammar.
6. Study design, sentence 2; remove the word ‘all’ in “Inclusion criteria were all as follows:”
7. Study design, sentence 2; include the word ‘a’ between ‘in’ and ‘stable’ in “..was in stable clinical..” to correct grammar.

Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

1. Abstract conclusion, last sentence “In adult CF patients, SA infections, in the absence of PA, are a marker of milder disease”. Clarification is needed here; A marker of milder disease compared with SA and PA co-infection? or PA infection? or both?
2. Background paragraph 2, sentence 7: Clarification.” In older children, SA infections are not consistently associated with poor prognosis, but perhaps even better survival post-transplantation”. Better survival compared with no SA infection? PA infection? or PA + SA infection?
3. Microbiology and laboratory data, sentence 2. Expand briefly on ‘standard biochemical testing’. Selective agar plates alone will not qualify as bacterial identification so the specific biochemical testing used is important here.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

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