Reviewer’s report

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

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Reviewer: Kirsten Schaffer

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

In this manuscript the authors present a cross-sectional study over a 26 months period (2011-2013) on the impact of cystic fibrosis (CF) airway microbiology on clinical outcomes (FEV1, pulmonary exacerbation rate, CRP and clinical scores). In a cohort of 84 adult CF patients, patients infected with Staphylococcus aureus only had less pulmonary exacerbations, lower CRP levels and better clinical scores than patients infected with Pseudomonas aeruginosa or patients infected with Pseudomonas aeruginosa and Staph. aureus. There was no statistically significant difference in FEV1 and FVC % between patient groups. Although the data is presented concisely and the paper is well written, there is significant additional information required on how the microbial infection/colonization status was determined. In detail I have the following comments/questions:

Major compulsory revisions:

1. Page 5, line 36: ‘at least one sputum microbiology culture’. One sputum culture would not be sufficient to determine the colonization status with a bacterial pathogen. Were all sputum specimen collected during the study period considered, or only specimen obtained at routine visits? What was the average number of sputum cultures per year in the 3 groups? How many of the specimen were positive for Staph. aureus or P. aeruginosa? Did the pathogens grow intermittently or persistently? Did the authors aim to quantify the bacterial load?

2. Page 5, line 36: ‘at least one routine visit’. What was the average number of routine visits per year?

3. Page 6, line 47: How often was spirometry performed per year in the 3 groups?

4. Page 6, line 67: The authors did not use a Staph. aureus selective agar to improve detection of small colony variants (SCV). CF patients with SCV strains do not always have normal-colony Staph. aureus isolates before. If some patients in the P. aeruginosa only group would be infected with SCV, would this have changed the findings?

5. Page 7, line 69: See before, what was the average number of sputum samples per year?
6. Page 7, line 73: What was the average number of CRP measurements per year? Were only CRP levels obtained during routine clinical visits analysed?

7. The authors do not mention whether patients in the Staph.aureus and P. aeruginosa only groups were infected with other pathogens that could have influenced exacerbation frequency and inflammatory activity like Aspergillus fumigatus (ABPA?).

8. Was PFGE typing analysis performed for a significant number of the P. aeruginosa isolates to exclude circulation of a virulent strain?

9. Page 8, line 94: ’20 (24%) only with SA, 14 (17%) with neither PA nor SA’. Did these patients have negative anti-pseudomonal antibodies?

10. Page 11, line 172: A study assessing the significance of SCV in adult CF patients has been published: Besier et al, J Clin Microbiol 2007, 45: 168-172

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I have no conflicting interests to declare!