Reviewer’s report

Title: Bacterial Contamination of Home Nebulizers in Children with Cystic Fibrosis and Clinical Implication on the Number of Pulmonary Exacerbations

Version: 0 Date: 11 Mar 2019

Reviewer: Reviewer 2

Reviewer's report:

PEER REVIEWER ASSESSMENTS:

OBJECTIVE - Full research articles: is there a clear objective that addresses a testable research question(s) (brief or other article types: is there a clear objective)?

Yes - there is a clear objective

DESIGN - Is the current approach (including controls and analysis protocols) appropriate for the objective?

No - there are minor issues

EXECUTION - Are the experiments and analyses performed with technical rigor to allow confidence in the results?

No - there are minor issues

Statistics - Is the use of statistics in the manuscript appropriate?

No - there are issues with the statistics in the study

INTERPRETATION - Is the current interpretation/discussion of the results reasonable and not overstated?

No - there are minor issues
OVERALL MANUSCRIPT POTENTIAL - Is the current version of this work technically sound? If not, can revisions be made to make the work technically sound?

Probably - with minor revisions

PEER REVIEWER COMMENTS:

GENERAL COMMENTS: The authors investigate microbial contamination of the nebulisers used to administer antibiotics to children with cystic fibrosis. Nebulisers are used at home and children and their parents are encouraged to clean the equipment between uses, but the extent to which best practice is followed has not been evaluated. Therefore, the potential exists for nebulisers to act as a reservoir for infection. The research objective was to determine the prevalence of contamination of nebulisers amongst a cohort of 61 children with cystic fibrosis. This is an important topic, worthy of investigation.

The authors report widespread microbial contamination amongst nebulisers of 61 children registered at a single hospital in Tehran, Iran. Seventy percent of tested nebulisers were found to be contaminated.

The study is generally well designed, with priority given to getting swabs and sputum onto agar rapidly post-sampling to prevent bias. However, more information could be provided on study design, including how sample size was determined and what primary outcome measure the study was powered to detect. The inclusion criteria for recruitment to the study mentions "administration of inhaled medication on a regular basis". This could be more clearly defined, as the frequency of administration is likely to influence the chances of contamination.

For a non-specialist, it would be useful to know what guidelines are given to children and their parents for cleaning of the nebulisers. The report mentions daily cleaning, but the method for cleaning is not specified. The methods sections mentions a questionnaire about nebuliser hygiene and maintenance, but the findings of this questionnaire are not discussed.
The results section reports interesting findings but is lacking in detail. Were there any instances of multiple species contamination? That is, examples of more than one organism being cultured from a single nebuliser.

The authors do not consider potential confounders in their discussion of their findings. As the authors acknowledge, the increased incidence of exacerbations in those children with pathogen-contaminated nebulisers may not suggest a causal relationship. It may, for example, reflect non-adherence to the cleaning nebulisers that may be linked behaviourally to non-adherence to treatment. The authors should discuss such potential confounders.

REQUESTED REVISIONS:

Design - Power calculation should be included and the inclusion criteria more clearly defined with respect to frequency of nebuliser use amongst the cohort.

Execution - The rationale for considering &lt;10 CFU as "clean" should be clarified. How is this distinguished from low-level contamination? The authors should state whether any examples of multi-species contamination were encountered. Decontamination/cleaning advice given to children and parents should be stated. Results of questionnaire regarding hygiene should be included.

Statistics - Power calculation should be included as stated above.

Interpretation - Authors should discuss potential confounders in the study.

ADDITIONAL REQUESTS/SUGGESTIONS:

The report is well written but there are some areas where a review of spelling/grammar is needed.

Note: This reviewer report can be downloaded - see attached pdf file.
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

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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