Author's response to reviews

Title: Pseudomonas aeruginosa in a neonatal intensive care unit: molecular epidemiology and infection control measures

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Author's response to reviews:

Sabina Alam, PhD
Assistant Editor
BMC Infectious Diseases

Dear Dr Alam,

RE: Revised version of manuscript No. 90006458484498 “Pseudomonas aeruginosa in a neonatal intensive care unit: molecular epidemiology and infection control measures”

Thank you for the detailed review of this work and for considering a revised version of the manuscript. We have carefully examined all the points raised by the Reviewers and the Assistant Editor and modified the manuscript accordingly. As per Assistant Editor’s request, we added a “Methods” section to the Abstract and structured Abstract and Manuscript according to the Journal style. A point by point response to the comments raised by the Reviewers and the Assistant Editor with the description of the changes is enclosed.

We believe that with these revisions the paper is now suitable for publication, and hope that the Editorial Staff agrees.

Yours sincerely,

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POINT by POINT RESPONSE TO REVIEWER Tim Eckmanns

We thank the Reviewer for considering the manuscript “an article of importance in its field” and for his suggestions.

Response to specific comment:

1. Following reviewer’s suggestion, we added to the revised manuscript a Table (Table 2) providing data on changes in compliance with hand disinfection and a new reference (ref. 21) on hand hygiene compliance. Also, we analysed our data by means of chi-squared test and Pearson’s correlation. The above information was provided in the Results section of the revised manuscript (second paragraph of page 10).

2. As per reviewer’s request, hand washing has been replaced by “hand disinfection” throughout the manuscript. That “the US Centers for Disease Control and Prevention (CDC) recommendations on hand disinfection” were followed was indicated in the Methods section (page 5 line 7) and the appropriate reference (12) quoted.

POINT by POINT RESPONSE TO REVIEWER Vladana Milisavljevic

We thank the Reviewer for her comments to the manuscript and for her suggestions. We have carefully examined all the points raised and modified the manuscript accordingly. Because of reviewer’s request, the molecular epidemiology of P. aeruginosa in the unit was better described. Also, following suggestion of both reviewers, we provided data on changes in compliance with hand disinfection and related statistical analysis in the revised manuscript.

Response to specific major comments:

Methods

1. As detailed in the Methods section (page 4 line 17), “For this study purposes, only severe infections (sepsis, meningitis, arthritis, pneumonia, urinary tract infections) were considered.”

2. As detailed in the Methods section (page 4 line 8), “The tertiary-level NICU of the University ‘Federico II’ hospital of Naples, Italy serves approximately 350 admissions per year including both inborn and outborn patients”.

3. Respiratory secretion cultures were considered either infectious or colonization samples depending on other clinical and laboratory sign in accordance with Centers for Disease Control and Prevention criteria as indicated in the Methods section (page 4 line 13).

Results

4. “During the first year of the study (July 2005 to June 2006), 9.17 severe infections/1000 patient-days were registered, while such rate decreased to 3.24 severe infections/1000 patient-days during the second year (July 2006 to June
During the study period, *P. aeruginosa* proved to be the third most common pathogen responsible for severe infections (12.1%), after *Candida* spp. (21.8%) and *Escherichia coli* (16.8%). Moreover, no pathogen was identified in 18.8% of infants diagnosed as having an infection.” This information was provided in the Results section of the revised manuscript (page 7 lines 5-11).

5. “In all 11 infected patients, surveillance cultures and clinical samples showed identical PFGE profiles, thus excluding the possibility of multiclonal infection in the same neonate…” This information has now been provided in Results section of the revised manuscript (page 8 lines 8-10).

6. As detailed in Methods (page 6 lines 16-17) and Results sections (page 7 line 19), genotyping was performed on all *P. aeruginosa* infection isolates and on available surveillance culture isolates.

7. Alert surveillance for *P. aeruginosa* included collection of strains isolated from clinical samples along with reinforcement of contact isolation precautions. This information was already provided in the Results section of the manuscript (first paragraph of page 9) and in the legend for Figure 1. As detailed in Methods section (page 6 line 16), all *P. aeruginosa* infection isolates were analyzed.

8. The discrepancy between the increase in the rate of colonization and the decrease in the infection rate at the 4th quartile 2006 time point might depend on individual neonates’ susceptibility to infection. Also, the sentence reported in the text (page 9 lines 5 and 6) was a mere observation without any cause-effect relationship between the phenomena.

9. “Environmental samples were obtained from the following sites: air, room surfaces, sinks, hand disinfectants, baby incubators, monitors, and staff hands.” This information has now been provided in Methods section of the revised manuscript (page 5 lines 1 and 2). The numbers of healthcare workers’ hands cultured, times and sampling procedures were also indicated in Methods (page 5 lines 11-16) and Results (page 10 lines 5-9) sections of the revised manuscript.

Discussion

10. Epidemiological information on multiresistant *P. aeruginosa* strains of PFGE profile G and O was provided in Results section (first paragraph of page 8). Because surveillance cultures and clinical samples showed identical PFGE profiles in all 11 infected patients, the possibility of multiclonal infection in the same neonate was excluded. The above information was also provided in the Results section of the revised manuscript (page 8 lines 8-10). The details of timing and choice of antibiotics in the two infants infected by these strains were beyond the purpose of the study.

11. In Discussion section of the revised manuscript (page 12 lines 15-20), we better explain that “Our findings indicate the presence in our NICU of multiple and distinct *P. aeruginosa* reservoirs, both environmental and human, and, owing to the long time period between the appearance in neonates (July 2005) and the environmental isolation (2nd quarter 2006), we are not able to understand whether the only sink sample found to be positive for *P. aeruginosa* PFGE profile A has been a result, rather than the origin, of the pathogen’s circulation in the ward.” Also, as detailed in the Methods section (page 5 line 2), “all three sinks
12. To better describe the infection control measures adopted to control P. aeruginosa outbreak, we added to the revised manuscript a Table (Table 2) providing data on changes in compliance with hand disinfection and related statistical analysis in the Results section (second paragraph of page 10).

Response to minor comments.
14. We have eliminated the extra line present in the first paragraph of the Methods section.
15. The terms “nosocomial infections” and “hospital-acquired infection” were replaced by the term “healthcare-associated infections” throughout the manuscript.