Reviewer’s report

Title: First multicenter study on multidrug resistant bacteria carriage in Chinese ICUs

Version: 2  Date: 11 May 2015

Reviewer: Christopher Lowe

Reviewer’s report:

- Major Compulsory Revisions

The author must respond to these before a decision on publication can be reached. For example, additional necessary experiments or controls, statistical mistakes, errors in interpretation.

Abstract:

1. Conclusion: MDRO prevalence was high in the ICU, but predominantly originating from patients colonized/infected on admission. With a high rate of MDRO on admission, there is a higher prevalence of admitted patients with MDRO making transmission potentially more likely. Concluding that the prevalence of MDRO is high, may minimize the source of MDRO in Chinese healthcare facilities. If efforts to contain MDRO in China only focused on the ICU (eg. infection control, antimicrobial stewardship, environmental cleaning), would that resolve the problem in the ICU if 1/3 of patients already have an MDRO no admission?

Materials and Methods:

1. Surveillance Program, paragraph 2: What was the rationale for defining A. baumannii and P. aeruginosa as MDRO based on resistance to a single agent? Was the 3rd generation cephalosporin specifically resistance to ceftazidime?

2. Surveillance Program: Were all of the facilities included in the study similar (beds, ICU size and infrastructure, patient population, etc.)?

3. Bacteriology, 2nd sentence: were all colonies that grew on the chromID MRSA considered MRSA? Were there basic tests to confirm the identity of the colony? Did you consider adding a confirmatory test for MRSA?

4. Bacteriology, last sentence: Please state what susceptibility testing method was performed for A. baumannii and P. aeruginosa.

5. Although surveillance was the primary purpose of the article, discussion of the results related to acquisition in the ICU is dependent on many issues, particularly infection control. It would be important for readers to understand the baseline infection control interventions for MDRO to put the results into context. What are baseline practices (precautions? Single rooms? Isolation?)? What are baseline hand hygiene rates?
Results:
1. Paragraph 1: The stated global prevalence rate of MDRO in the text is 30.5% (results and abstract), but Table 1 reports a percentage for all MDRO as 36%. Please correct.
2. Paragraph 1: ESBL-producing Enterobacteriaceae was the most prevalent MDRO. What was the distribution of isolates, with respect to E. coli and K. pneumoniae?)
3. Table 1: All of the values listed in Table 1 are described as rates (per 100 admissions or per 1000 hospital-days). However, all of the results are reported as percentages. Did you intend to report a proportion of patients with an MDRO (%) or a rate of patients with MDRO (based on admissions or hospital days)?
4. Table II/III/IV: Length of stay. In the brackets, does this represent the range or an interquartile range?
5. Table III/IV: As stated in the text, the data for ESBL and MRSA were comparable to any MDRO acquisition. Given this, I think it may be more suitable to either condense these tables or provide them as supplementary tables.
6. Paragraph 1: In the discussion of median time to acquisition, was this based only on screening swabs? Were any clinical isolates taken into account (eg. positive tracheal aspirate or blood culture)?

Discussion:
1. Paragraph 2 and 3: There is a lot of text describing a comparison between the study ICUs and French/Dutch studies. Are the practices in these countries (and facilities) comparable to China? Perhaps further discussion related to the epidemiology of ARO’s in other Asian countries may provide a more comparable comparator.
2. Paragraph 3: As mentioned in the results, although hand hygiene and isolation precautions were not recorded, it would be very helpful to know the underlying policies and baseline procedures at these facilities.

- Minor Essential Revisions
The author can be trusted to make these. For example, missing labels on figures, the wrong use of a term, spelling mistakes.

1. In several instances, Enterobacteriaceae was spelled enterobacteria.
2. Standardize the MDRO acronym as both MDRO and MDROs is listed.
3. Verb tenses need to be corrected (eg. line 72, ‘infection control teams are in place since 2000.’, line 76: ‘most of the reports are dealing with…”).
4. Introduction: line 70, ‘multidrug resistance’; line 89, consider rewording to ‘available data on bacterial resistance may overestimate resistance rates.’

- Discretionary Revisions
These are recommendations for improvement which the author can choose to
ignore. For example clarifications, data that would be useful but not essential.

Materials and Methods:
1. Surveillance Program, paragraph 2: For MRSA colonization, only nasal carriage was performed for patients. Sensitivity of detecting MRSA can increase with more sites sampled. Perhaps that may have resulted in an underestimate of MRSA colonization?

2. Surveillance Program, paragraph 2: I think that this surveillance tool would have been enhanced by including vancomycin-resistant Enterococci, and for the follow-up studies, to include carbapenemase producing organisms.

Results:
1. Did the results differ depending on the ICU being analyzed? Were all ICUs in the study having similar rates of MDRO (at baseline before admission, during and on discharge)?

2. With a prevalence rate of 51.2% on discharge, was there analysis of transmission? Were they epidemiologically related, or perhaps genetic investigation into relatedness (eg. PFGE)?

3. The presentation of data with ‰ is not commonly used. Perhaps writing it out may be clearer to readers.

Discussion:
1. The high rate of MDRO on admission to ICU is quite high. Was this consistent across all sites?

2. In the discussion, there is a comparison of rates between this study and others, but perhaps more time can be spent on the potential reasons for the differences.

3. Similar to the question above, a further description of ESBL-producing Enterobacteriaceae may be helpful as the epidemiology of transmission for these organisms are not necessarily the same.

Language:
I think that the language used can be more specific to provide a clearer description (eg. first paragraph, introduction: “…and despite the fact that results are heterogeneous, some are encouraging.”; last paragraph, discussion: “We showed that bacterial resistance is of concern and that it should be addressed with energy”).

There are many sentences and passages in the manuscript that are difficult to follow, and would be best to be re-worded to ensure that the message comes across as the authors intended (eg. 2nd paragraph, discussion: “In one of the latter studies, … but the CTX-M-producing E. coli outbreak was on its premise.”; 3rd paragraph, discussion: “These figures cannot be confronted to the proportion of MDRO within each species…”).

In addition, at times, the choice of words could be re-assessed for better clarity
These are some of the selected examples, and I think it would be helpful to have further revisions focusing on fine-tuning the language.

**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:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'