Reviewer's report

Title: Polymicrobial bloodstream infections in the neonatal intensive care unit increase mortality: A case-control study

Version: 1 Date: 10 May 2014

Reviewer: Eugene Dempsey

Reviewer's report:

Thank you for asking me to review this manuscript. The authors are to be commended for undertaking such a detailed study. The obvious strengths of the study are the large number of blood stream infections identified, and the ability to compare mono versus polymicrobial infections. Whilst this has been well documented in the adult and child literature, such data is still lacking in the neonatal population, and the exact definition of a polymicrobial definition is not consistent. The study design has been well thought out and performed, but is limited by its retrospective nature and the various limitations this design brings. I would have the following concerns which are addressed below.

Major Compulsory revisions

A general comment would be to follow the Strobe criteria (STrengthening the Reporting of OBservational studies in Epidemiology) for case control studies.

The remaining concerns are minor essential revisions

Intro

This is well presented. I would recommend adding a section on what constitutes a polymicrobial infection.

Line 77 : I would remove to results/discussion section

Methods:

1. Who enters the data into the clinical microbiology database? How were potential contaminants which may have been real clinical infections dealt with?

2. The definition of a polymicrobial infection needs to be clarified. Whilst I understand the definition as it stands, I had to read it a few times to clearly understand what it means. This is important for external generalisability of the results. A clearer definition should be provided e.g.

A polymicrobial infection was defined as either:

1. isolation of more than one organism from a single blood culture specimen or
2. Isolation of two different organisms from two different blood culture specimens obtained from a single infection episode.

Or something to this effect.
3. Line 108; Please add..... during the time period 2009 to 2012.

Results

1. Table 1. The denominators are confusing. 102 versus 74? What time period is this over? Is it different from 2009-2012?
2. Table 1A is not necessary.
3. Did the authors consider a subgroup analysis of those babies less than 1500 grams? And those with complex medical or surgical conditions?

Discussion

1. The discussion is generally well presented although there is some repetition which should be removed.
2. The mortality question is interesting and could be further developed.
3. A general discussion on antimicrobial use, resistant organisms and the benefits of an antimicrobial surveillance

**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 declare that I have no competing interests