Reviewer's report

Title: Deciphering risk factors for blood stream infections, bacteria species and antimicrobial resistance profiles among children under five years of age in North-western Tanzania: a multicentre study in a cascade of referral health care system

Version: 0 Date: 09 Nov 2018
Reviewer: Walter Dehority

Reviewer's report:

This is an overall well-written and interesting study from Tanzani. It is likely to be of public health and clinical significance, and is relevant in the field. I have included a few comments for possible revisions. Grammatical suggestions are intended to be suggestions only, and would not interfere with the content of the sentence.

Abstract
Line 20: '…cause a complex cascade…'
Line 21: '…resulting in significant…'
I think in the background section you need to describe what the goal of the study is overall, and/or your specific aims/objectives (e.g. to provide a descriptive overview of BSIs in this area? To identify risk factors for mortality and/or bacteremia?). This is done better in the Background section, lines 78-85.
Methods section: What are the inclusion criteria? I think we need more information here. Was it children presenting to care with a concern of a BSI (e.g. fever)? Was it those children with a blood culture collected, or with a positive blood culture? Again, this is discussed better in the methods section.
Results/Conclusions: In order to state that 14.2% was the prevalence, would need more information. This also in part goes back to the comments in the methods section: who exactly was eligible for enrollment? This also changes the prevalence. Is this the prevalence of BSIs among children presenting with a fever, or among those admitted to the hospital, or overall among children?
Line 43: Might want to re-write as 'Would prioritize interventional measures…'

Background
Line 51: '…inflammatory processes…'
Lines 54-55: 'Introduction of vaccines and advancements in technology…has resulted in a paradigm shift…'
Line 57: Typically referred to as Haemophilus influenzae type b, not group b.
Line 58: Neisseria meningitidis
Line 59: Would not just capitalize the 'E' and not the other letters for ESBL
Lines 56-60: I would specify what population to which you are referring here. ESBL enterobacteriaceae are not predominant in community acquired BSIs, at least in many countries. So depends on what population to which you are referring----community or hospitalized.
Line 66: Not sure what is meant by 'their utilities are good'. Also would state '…applicability has remained…'

Study Design and Settings
Would state the dates the study was conducted (e.g. March 1, 2016 to October 31, 2017).
Was enrollment retrospective or prospective?
Do you have information on the number of children presenting with clinical symptoms of BSI's?
We are given data on the bed capacity of each hospital (Table 1), and the number of enrolled children, but not the number of potentially enrollable children (which would allow us to determine if the enrolled sample size is likely to be representative of the population under study.

Table 2
Is 'Presence of an IV Line' meant to convey that the children had an IV at the time of presentation (in which case, 73.3% seems high) or an IV line during admission? Same question as well for urinary catheters.
Line 178: necrotizing not necrotising
Line 187: 'The most common bacterial species were…'
This is a high rate of Klebsiella bacteremia. How many of these were healthy vs with co-morbidities?
Line 199-200: 'The majority of bacteria were…with resistance rates ranging…'
Line 201: Would italicize spp
Throughout the text can use p=0.xxx as opposed to p-value=0.xxx
Table 3: S. aureus is listed as 100% susceptible to ampicillin. But this would thus imply there was no MRSA in the cohort, and yet the text states there was MRSA---would clarify.
Other Gram positive bacteria in Table 3 appears to include enterococcus. Was any VRE found?

Discussion
Line 301: 'This current…has shown a higher…'
Line 315: '…similar findings of a predominance of…'
Line 317: '…there is a preponderance…'
Line 322-323: To what invasive procedures are you referring?
Line 329: '…prior to starting…'
Lines 328-331: I'm not sure how collecting blood cultures prior to starting antimicrobial therapy connotes a higher proportion of hospital associated BSI's. If the infant was admitted from the community this would not be the case.
Line 333: '…shows that the proportion of…than the 25% to 50%…'
Line 336-337: 'Fortunately, the majority of…'
Line 340: '…than the 28.0%…'
Lines 344-345: 'A predominance of…compared to E. coli has been reported…'
Lines 375-376: '…in a state-of-the-art review…'
Line 377: '…analysis were prematurity, low…'
Line 378: It states here that low median weight for age is a risk factor for BSI, but in the results section it said that once weight was age-adjusted, it was no longer a risk factor for BSI (lines 249-253)---would clarify.
Lines 416-423: Interesting discussion of MDR GI pathogens. Given this, is Group B streptococcal prophylaxis (e.g. ampicillin) used for pregnant mothers in labor in Tanzania?
Line 428: '…higher than the 2.8%…'
Line 436: '…a comprehensive…'
Line 445: '…remaining the most vulnerable…'
Line 447: What is meant by 'strengthening of culture'? To obtain more cultures, to increase the frequency of culturing, to do so in a more sterile fashion, etc?
Line 450: '…should be a specific target group…'

List of Abbreviations
I don’t see IPC listed, which is used in the text

References
Reference 7 does not italicize the journal title
Reference 21: Would list the date the website was accessed.
Would ensure all references have appropriately abbreviated journal titles, if applicable (e.g. references 34, 35, 36, 38 and 42 do not)
Reference 55 needs to italicize the journal title and bold the volume
The map has a fairly low resolution---not sure if this would improve with publication or not, but is hard to read now

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

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

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