Reviewer’s report

Title: Drug related problems in Neonatal Intensive Care Unit: incidence, characterization and clinical relevance

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Reviewer: Luke Grzeskowiak

Reviewer's report:

The authors report findings of a study aimed at evaluating the incidence, characteristics, and clinical relevance of drug related problems occurring within the Neonatal Intensive Care Unit.

This is an important study and appears to be well conducted and described.

I have a number of comments below relating to the manuscript. These are largely focused on providing greater information to the reader regarding examples of DRPs, rather than any great methodological concerns.

One of the major difficulties in evaluating this type of research is in only being presented data on DRPs that are already classified. I appreciate that it would require additional work, but I think readers would greatly appreciate a table that lists the classification scheme and examples of DRPs identified in this study. I.e C3.1 Drug dose too low e.g. gentamicin prescribed 4mg instead of 6 mg daily. This could be included as a supplemental table/s.

An aspect missing from the manuscript is discussion of systematic errors versus incidental errors. That is, how many DRPs are process related issues due to absence of an appropriate clinical practice guideline? Or are these still occurring despite a guideline suggesting the guideline is not being used appropriately? These are important learnings from such a study and deserve comments in discussion.

The study occurred over a 2-year period and identified distinct trends in terms of common DRPs. This raises another question as to whether or not anything was done at a process level in an effort to prevent DRPs? I.e. gentamicin dosing errors are common, were staff educated about this, was a guideline developed to try and reduce number of errors? Was number of DRPs related to gentamicin consistent across 2-year period?

How were preventative pharmacist interventions handled in the study? That is, when medical staff ask the pharmacist to recommend an appropriate gentamicin dose this represents an important clinical pharmacy intervention. Was this classified as a DRP? This just requires short clarification in the methods to state whether only DRPs identified from medication charts were included, or whether potential DRPs avoided as a result of pharmacist intervention were also included.
I think it would be useful to include an example of a DRP rated at each severity level as well. This might be included just in discussion, but helps highlight importance of clinical pharmacy interventions.

Is there any notion as to whether identified DRPs were the results of deliberate actions or accidental errors?

Out of interest, what was the margin of error for determining of a drug was too high or too low. (i.e. more than 10% of original dose? More than 20%? Some errors simply occur due to rounding of medication doses and discrepancies less than 10% are unlikely to be clinically significant)

My only real methodological concern relates to rating of DRP severity. Not including input from medical staff is a limitation as pharmacists may overstate the potential severity of DRPs. I think this should be noted in the discussion of study limitations.

Page 8 - please elaborate on comment regarding 'non-rational preparation of amphotericin B', as this is not inherently clear what this means

As was previously eluded to, there are a number of strategies for attempting to reduce/prevent DRPs. As an example, there is extensive literature relating to intervention for reducing medication errors and these are summarised in recent systematic reviews:


Future research exploring risk factors for DRPs are suggested, but it may be worth including a section in the discussion regarding how certain evidence-based interventions may or may not be useful for preventing DRPs? That is, what % of DRPs identified in this study could have been prevented? Or, are many unlikely to be avoided? The unit already has comprehensive clinical pharmacy services which is fantastic and this likely reduces DRPs (as it has been shown to reduce medication errors at least).

Table 2
I think it would be beneficial to present breakdown of results for problems (i.e. P1.1 not just at parent level P1). This helps reader understand the types of problems occurring more effectively.

P4 - Others require some clarification as it is completely unclear what types of DRPs this constitutes.
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?
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Yes

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