Reviewer's report

Title: Variations in rates of nosocomial infection among Canadian neonatal intensive care units may be practice-related

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Reviewer: John van Aerde

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General
This study has analyzed the data of nosocomial infections in ¾ of the neonatal level 3 admissions in Canadian Neonatal Intensive Care units between January 1996 and October 1997. Data on more than >16,000 infants were analyzed, 3,253 for infants < 1,500g birth weight and 13,228 for infants > 1,500g birth weight. After adjusting for known risk factors like gestational age, admission day SNAP-II score and outborn status, the rates of nosocomial infection in the NICUs varied considerably, implying that the remaining differences are due to differences in clinical practices which may be modifiable by altering practices.

General Comments:

In general, the findings in this paper are not new, as similar findings have been published by the US collaborative and the Vermont-Oxford database. However, what is new is the finding of different nosocomial infection rates between NICUs which may be due to clinical practices.

The data is slightly outdated as they are 7 to 9 years old. Practices and structural design of several NICUs in Canada have been changed over that period of time and overall numbers is likely to have changed over the last decade. However, the variation between NICUs remains valid.

How did the authors determine whether one blood culture positive for Coagulase negative Staph (CONS) was be a real infection or a contaminant? Some NICUs draw one blood culture, others draw two. The use of different volumes and one or tow bottles of broth is also a known variable and can introduce errors.

Nosocomial infection was defined as hospital-acquired infection. However, the tables indicate that there were children with NEC. Given the gestational age of the infants, it was also likely that some patients experienced bacterial translocation. Should gram-negative infections be included with nosocomial infections? Probably better to limit to proven CONS infection for the purpose of this paper.

This is an observational study: therefore, the best that can be said is that these are associations, not causations, as also stated by the authors at the end of the discussion. One intriguing question remains: can one statistically tease out â€œcauses and associationsâ€ which are so intimately interlinked? The infants with the lowest gestational age will be the smallest and are likely to be the sickest, and therefore they will have central and peripheral venous and arterial lines, they do need parenteral nutrition (which can only be given through venous lines) and they are on assisted ventilation. Can this circular argument truly be broken by the use of multivariate logistic regression?
Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Specific Comments:

Abstract: clear and well-written.
Background: provides info required to place this paper in context of others. Last sentence of paragraph 2 requires re-phrasing.
Results: - reasonably clear description of what was done and analyzed. The last paragraph of “Organisms and antibiotics” requires explanation. Why was it that antibiotics were given on day 1 and/or day 3? Day 1 or 3 of what?
- “Risk factors predictive of nosocomial infection on multivariable logistic regression” : line 5: should this read < 33 weeks?
Discussion: well written.

In general, the message of variability of nosocomial infections among NICUs is important. However, some definitions need to be narrowed or re-defined, particularly as to the definition of nosocomial infections and how the diagnosis was made.

Discretionary Revisions (which the author can choose to ignore)