Reviewer's report

Title: Epidemiology and impact of a multifaceted approach in controlling Central Venous Catheter Associated Blood Stream Infections outside the intensive care unit.

Version: 4 Date: 30 January 2013

Reviewer: François L'Hériteau

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Some mistakes in numbers and some methodological issues need to be corrected before this article being suitable for publication

Major compulsory revisions

Abstract

The authors confirm in their response, that the check-list for CVC insertion was implemented only in ICU. This precision should be added in the abstract since the reduction in CVC-ABSIs incidence was observed outside ICU.

Methods

It remains unclear if catheter care was performed with aqueous povidone iodine or with alcoholic chlorhexidine for patients with a CVC inserted in ICU (i.e. with alcoholic chlorhexidine). Do the authors mean that aqueous povidone iodine was used for catheters care even for catheters inserted in ICU with alcoholic chlorhexidine as antiseptic solution?

Prevalence studies

The number of catheter-days retrieved from prevalence studies seem to have increased from 2001 (1,487 catheter-days) to 2008 (2587 catheter-days) and then to have decrease from 2008 to 2011 (1,285 catheter-days). Do the authors have an explanation for these variations (i.e. modification of case-mix, modification of CVC policy, both)? The former period is displayed in the result section (page 9, 1st paragraph) and the latter in table 1. Perhaps it would be more convenient to disclose the whole 2001-2011 period in the same part of the paper.

Bacteraemia surveillance

There is still a mistake in the number of CVC-ABSIs episodes and patients recorded (page 9). A total of 309 CVC-ABSIs were recorded in 260 patients. Among these patients, 244 experienced one episode and 36 more than one episode. The total accounts for 280 patients. Similarly, the total number of episodes \[244 + (25^2) + (9^3) + (2^4)\] account for 329 rather than 309.

The authors still do not present the design of their case-control study in which they compute Odds Ratios (page 10). They should describe the design and the
aim of this study. They should define the case and the control patients. Were controls, patients with a CVC but no CVC-ABSI? Were they patients with a peripheral catheter-associated BSI? If so, I do not understand the objective of this comparison since it would not describe risk factors for CVC-ABSI. Perhaps, this part could be deleted. Whenever they display Odds Ratio, the authors should define the reference class (i.e. the class with an OR = 1).

Page 10 last paragraph, the authors state that “the distribution per months showed higher incidence during July-September than in the rest of the year” but still do not provide data (i.e. incidence in periods other than July-September) to support this statement.

Outcome of bundles

The authors should add the precision that “CVC-ABSI rates” (e.g. results section in abstract; page 11, 1st paragraph; page 12, 3rd paragraph) are actually “estimated CVC-ABSI rates” (since the number of CVC-days is calculated rather than observed).

To compare CVC-ABSI incidence densities (i.e. /1000 catheter-days), either between Surgery and Internal Medicine wards, between years, or between different periods in the same year, the chi square is not appropriate. The authors should use Poisson 95%CI (using the estimated denominator, since they do not know the actual number of CVC days). The chi square test is designed to compare proportions (when the numerator is a portion of the denominator) and thus would be appropriate to compare CVC-ABSI/100 inserted catheters incidences.

Page 11, 2nd paragraph, the authors state that “the rate of inpatients blood cultures performed and the rate of alcohol-based hand rub consumption increased slightly”. However these increases are not statistically significant. Notably, the AHR consumption variations (increase from 2.34L/1000 PD to 6.07; then decrease to 3.5; and finally increase to 5.2) might actually be due to chance. The precision that variations were not statistically significant should be added at least for AHR consumption.

Discussion

Page 13, 2nd paragraph, the authors state that “The incidence increased possibly (...) due to a better detection of bloodstream infections”. They argue in their response that “the rate of performed inpatients blood cultures increased slightly”. However, this increase occurred (2008 to 2011) after the increase in CVC-ABSI incidence (before 2008 in figure 1). Thus, unless the performed blood cultures/inpatients-days ratios before 2008 are disclosed, there is actually no data to support the hypothesis of an increase in CVC-ABSI incidence due to a better detection. Similarly, no data support “an increasing use of these catheters”.

Page 14, 2nd paragraph, the authors suggest a cause-effect relationship between the “bacteraemia zero” programme and a decrease in CVC-ABSI rates outside ICU. They should discuss why the programme was implemented in ICU and the reduction in CVC-ABSI was observed outside. Is it possible that the
reduction was observed because of a shorter duration of CVC exposure between 2008 and 2011 (as suggested by the reduction in the estimated number of CVC-days)?

Several typing mistakes remain

Abstract: “in internal wards” Do the authors mean “in Internal Medicine wards” or “in inpatients wards”?

Page 11, 1st paragraph of discussion section “The decreased achieved” should probably be “The decrease achieved”

Page 13, 1st line, “bundless” should probably be “bundles”

Page 14, 2nd paragraph, “CVC-ABSIs rates in internal wards”. Do the authors mean “in Internal Medicine wards” or “in inpatients wards”?

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests