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.

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Reviewer: François L'Hériteau

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The authors substantially improved their manuscript which now focuses on outside-ICU central venous catheters (CVC)-associated bloodstream infections (CA-BSI) rather than all catheters (i.e. including peripheral catheters) related bloodstream infections. However this paper needs several corrections before being suitable for publication

Major compulsory revisions

Prevalence studies
There probably is a mistake in the number of patients included in the prevalence studies (page 8, 1st paragraph in the results section). The total number of inpatients included overall was 9249. Among them, 1968 were in the 1991-1995 period, 1995 were in the 1996-2000 period, 2511 were in the 2001-2005 period, and 3426 were in the last period. The sum accounts for 9900 patients. Besides, the word “followed” is not appropriate and is confusing since in a prevalence study the patients are not followed and the outcome is not recorded.

The number of catheter-days retrieved from the prevalence studies (and then used as denominators for CVC-ABSI incidence rates) should be displayed.

Bacteraemia surveillance
A total of 309 CVC-ABSI were recorded in 273 patients. Among them, 36 had more than one episode, leaving 237 patients with 1 episode. A total of 85 CVC-ABSI occurred in the 36 patients with more than one episode (2 episodes in 25 patients, 3 episodes in 9 patients, and 4 episodes in 2 patients). Thus, the total of CVC-ABSI would be 322 (85 + 237) instead of 309.

Were there ESBL-producing strains among Enterobacteriaceae isolates (i.e. 4 E. coli, 3 K. pneumoniae, 2 S. marcescens, 1 P. mirabilis)? Were the 3 “other Gram-negative micro-organisms” Enterobacteriaceae or non fermentative?

The authors introduce Odds Ratios in the result section (pages 9-10). However, the design of this part of the study is unexplained. I assume they performed a case control study. If so, the design of the study should be described. The objective of these comparisons is unclear. The case as well as control patients should be defined. The reference classes for each OR should also be defined.

Chi-square test is not appropriate to compare CVC-ABSI incidence rates,
expressed as number of CVC-ABSI per 1000 catheter-days. Chi-square test would be appropriate to compare proportions (e.g. number of CVCs with BSI / total number of CVC). In the present situation, Poisson regression analysis is more appropriate. The authors state that “the results are the same using Poisson model” (last line of 2nd paragraph page 10, and legend to table 1). They should present these results (with CI95%) when appropriate, instead of chi square.

The authors should describe in Method section how they calculated device utilisation ratios (page 7, last paragraph).

Since the denominator is computed from prevalence studies rather than actually measured, CVC-ABSI/1000 catheter-days incidence should be presented as “estimated incidence” which is not always the case (e.g. page 10, paragraph 2, and page 11, 3rd paragraph).

Data from outside-ICU wards other than Internal Medicine and Surgery (notably from Oncology ward and Haemodialysis unit) are not shown in table 1. The choice to display only Internal Medicine and Surgery data should be explained.

The authors make several statements or hypotheses, but do not provide data to support them
• Page 10, 3rd paragraph: “From 2008 to 2011 the rate of inpatients blood cultures performed and the rate of alcohol-based handrub consumption increased”. However, this increase was not statistically significant.
• Same paragraph: “there was no significant difference between the years in rate of central line use and in other variables analysed”. No data support this.
• Page 12, 2nd paragraph: “the (CVC-ABSI) incidence increased possibly due to an increasing use of these catheters in a progressively ageing population, with greater comorbidity (…) and a better detection of bloodstream infection”. However, table 1 provides data only from 2008, after the increase of CVC-ABSI incidence. No data support a better detection of BSI.
• Page 12, last paragraph: the difference in CVC-ABSI rates between Surgical and Internal Medicine wards seems to be related to the difference in alcohol-based handrub consumption between theses wards. However such a difference does not seem to be statistically significant.
• Same paragraph: the number of CVC-ABSI increased in summer. This increase is not shown. Could this increase be due to a variation in nurse to patient ratio in summer?
• Page 8: the CVC use was not different in summer than in the rest of the year. No data support this.

Minor essential revisions
The meaning of “#” in table 1 (lines “Prevalence use of parenteral nutrition by central line”) is not explained
Several typing or spelling mistakes remain and some sentences probably need to be revised
Page 5, the 1st sentence of 2nd paragraph: “…a single medical of infectious diseases unit…”
Page 10, 1st paragraph of discussion section: “The decreased achieved…”
Page 11 3rd paragraph, 7th line: “burns patients”
Page 11, last line: “bundless”
Page 13, “CVC-ABSIs rates in internal rates”
Page 18, table 1 title: “Eeipidemiology…”

Discretionary revisions
It is unclear why the authors describe (page 7) a “bacteraemia zero” program which focused in ICU, since the topic of the present study was outside-ICU wards. Besides, in the abstract, this program does not seem to be implemented only in ICU. How could this ICU program reduce outside-ICU rates? Were BSI that occurred outside ICU in a patient with a CVC inserted earlier in ICU included in the surveillance? What was the proportion of these CVC-ABSI among all CVC-ABSI? Was the location of CVC insertion (inside vs outside ICU) recorded?

From January 2009, skin antisepsis was performed with a 2% chlorhexidine gluconate-70% isopropyl alcohol solution and with aqueous povidone iodine solution outside ICU. Which was antiseptic solution used for CVC dressing in patients with CVC inserted in ICU after ICU discharge?

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**

I declare that I have no competing interests