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Nation-wide survey of catheter-related bloodstream infections in medical, surgical and intensive care settings, 2019

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Background: Prevention of intravascular catheter-related bloodstream infections (CRBSIs) is a public health issue. In this context, a nation-wide network, named SPIADI (Surveillance and Prevention of Invasive Devices Associated Infections) gathers the French infection control teams who develop in their hospitals a 3-pronged strategy combining CRBSI-monitoring, field observation, and education of the healthcare-workers responsible for insertion and use of catheters along the patient course.

Materials/methods: A nation-wide 3-month survey of CRBSIs was conducted (January-April 2019) to provide a baseline description of CRBSI events in both ICU and non-ICU French hospital settings, to identify potential interventions. We used a unit-based protocol close to ECDC-HAI-Net-ICU protocol 1.02. Briefly, for all nosocomial BSIs, the variables studied included patient age and sex, place of acquisition, portal of entry, and for CRBSI, insertion site and time between insertion and first signs of BSI.

Results:

- 1001 participating hospitals (including 64% of the 529 French tertiary-hospitals, 54% of the 570 acute-care clinics, 89% of the 18 oncology specialized-hospitals), covering 179477 beds (including 60% of the 6313 French ICU-beds), 13390393 patient-days (PD) and 701277 dialysis-sessions.
- 9381 nosocomial BSIs detected, including 3292 CRBSIs (31%); higher prevalence for dialysis-units (71%), cancerology (56%), hematology (36%) and ICUs (33%).
- CRBSI acquisition into hospitals (87%) or following home-care or inner-city-medical-care (13%); into ICUs (21%)
- CRBSI associated with implantable-venous-access-port (ivap) (33%), central-venous-catheter (cvc) (24%), peripheral-inserted-central-venous-catheter (picc) (14%) and short-peripheral-venous-catheter (PVC) (15%).
- Predominance of *S.aureus* (21%), *CoNS* (28%) and *Enterobacteriaceae* (19%); multidrug-resistant bacteria/fungi in 9% of CRBSI (15% in ICUs)
- 36% ivap-RBSI associated with *staphylococci* and arising >4 weeks after insertion, suggesting no strict asepsis during catheter use.
- 25% cvc-RBSI associated with *staphylococci* and arising <7 days after insertion, suggesting inadequate skin antisepsis during catheter insertion;
- time between PVC-insertion and first signs of BSI >7 days in 20% of *S.aureus*-pvcRBSIs, suggesting long-term use of PVCs.
- Clusters of *Paeruginosa*-, *K.pneumoniae*- and *Enterobacter*-CRBSI in ICU and hematology-oncology wards, suggesting environmental contamination.

Conclusions: The description of CRBSIs currently detected in intensive care, medical and surgical settings, provides multiple opportunities for improvement, and allows defining SPIADI-network priorities for 2020: (1) local observation of catheter insertion and use to detect the likely gaps between practice and guidelines, and (2) an awareness-building activity on the epidemic risk associated with sinks colonized by *Enterobacteriaceae* into ICUs.

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