Title

Prolonged and Inappropriate Central Line Utilization in Nursing Homes (NH) Related to Broad Spectrum Antibiotics

Journal

Open Forum Infectious Diseases, 4(suppl_1)

ISSN

2328-8957

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Publication Date

2017-10-01

DOI

10.1093/ofid/ofx163.1690

Peer reviewed

Research grant; Allergan: Grant Investigator, Research grant; Infective Technologies, LLC: Co-Inventor of the Nitroglycerin-Citrate-Ethanol catheter lock solution technology which is owned by the University of Texas MD Anderson Cancer Center (UTMDACC) and has been licensed by Novel Anti-Infective Technologies, LLC in which Dr. Raad is a s and Shareholder, Licensing agreement or royalty.

2159. The Impact of a National Intervention on Hospital-Acquired Bloodstream Infection Rates in Israeli Intensive Care Units

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Session: 241. HAI: Device-related Infections
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Background. Hospital-acquired bloodstream infections and the subclass of central line-associated bloodstream infections (CLABSI) are associated with considerable morbidity, mortality, and healthcare costs. The burden of central line-associated bloodstream infections (CLABSI) in Israeli intensive care units (ICUs) has not been previously described. The present study aimed to assess the impact of implementing the NHSN practice recommendations for CLABSI prevention in Israeli ICUs.

Methods. A prospective, national, ongoing interventional program was conducted from January 2012 until December 2016 in all adult and pediatric ICUs in Israel, The NHSN practice recommendations were introduced and implemented during 2012, including of insertion and maintenance bundles, education, outcome surveillance and feedback on CLABSI rates. The Israeli national nosocomial surveillance program is a mandatory, confidential system. Data on CLABSI and non CLABSI events were collected monthly. Feedback was disseminated to all hospitals twice yearly. Between January 2012 and December 2015, definitions were based on the 2012 NNIS/NHSN system; they were updated in 2016.

Results. 114 ICUs in 30 hospitals contributed to 1,727,000 patient-days (PD). During the study period, a total of 6741 acquired BSI events were reported, 63% were non-CLABSI. In total, 2488 cases of CLABSI were observed over 447,436 central line days (CLD). The pooled mean baseline total BSI and CLABSI rates were 5/1000 PD and 7.4/1000 CLD, respectively, and these decreased significantly to 3.3/ 1000PD ($P < 0.001$) and 4/1000 CLD ($P < 0.001$), respectively in 2016. (graph 1 and 2).

Conclusion. Following a national intervention, significant decreases in both total BSI and CLABSI rates were observed. The large proportion of non-CLABSI BSI highlights the necessity to evaluate causes of non-CLABSI events and implement prevention measures.

Figure 1: Mean incidence rates of CLABSI and non-CLABSI per ICU type in 114 ICUs, Israel, 2012–2016

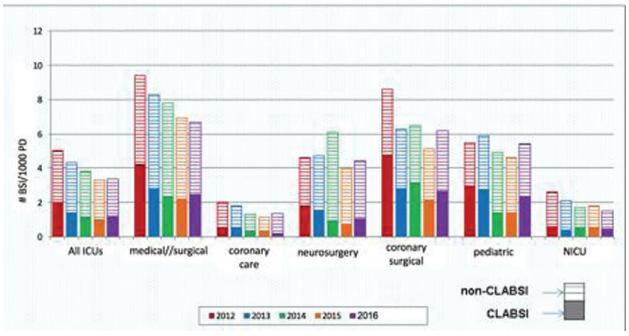
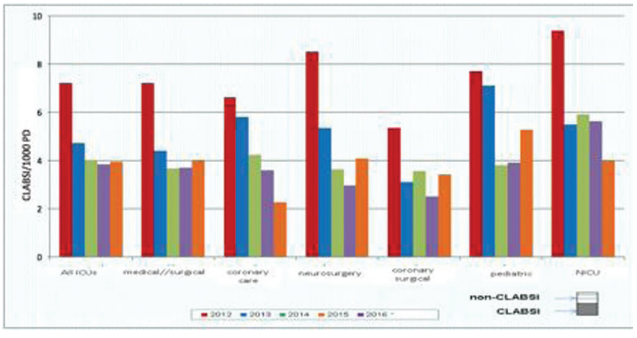


Figure 2: Mean incidence rates of CLABSI per ICU type in 114 ICUs, Israel, 2012–2016



Disclosures. **All authors:** No reported disclosures.

2160. Peripheral Intravenous Catheters – "They Don't Get No Respect"

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Session: 241. HAI: Device-related Infections
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Background. Over 300 million peripheral intravenous catheters (PIV) are used yearly in the United States resulting in up to 146,000 cases of bloodstream infection. Despite their importance, relatively little effort has been invested in understanding their use and minimizing their risk.

Methods. A series of point-prevalence surveys were conducted over a 10 week period on all inpatient units at the Nebraska Medical Center, a 689-bed academic medical center, to ascertain patterns of intravascular catheter use, securement techniques, dressing integrity, and evidence of phlebitis.

Results. All inpatient units were surveyed at least three times by specially-trained observers resulting in assessments of 1,217 patients: 87 (7%) had no IV access, 667 (55%) had PIV only, 395 (32%) had central venous catheters (CVC) only, and 68 (6%) had both PIV and CVC. Not surprisingly, patients in the ICU were more likely to have a CVC than patients cared for on the ward ($P < 0.001$). PIV were located in the following anatomic sites: hand (27.1%), wrist (16.5%), forearm (26%), antecubital (25.1%), upper arm (3.9%), foot (0.5%) and other (0.9%). 99% of PIVs were covered with a transparent dressing. Only 1% of PIVs were dressed with gauze and tape and 6.5% were further covered with occlusive wraps. In addition, some PIVs were secured with tape (58.5%) or a device (9.2%). Secondary anchors, tape, or foam pads, were used to secure the IV tubing in 60.2% of patients. PIV dressing condition was assessed and 46.8% had significant edge lift and 21.5% had blood or fluid under the dressing. 24% of the PIV dressings had an application date noted. Patients in the ICU were more likely to have a PIV dressing application date noted on the dressing than ward patients (31% vs 23%, respectively, $P = 0.047$). Five percent of PIVs exhibited signs of phlebitis.

Conclusion. PIVs and other vascular access devices are nearly universal in hospitalized patients. There is great variability in the anatomic location of PIVs and in the manner they are dressed and secured – resulting in an opportunity for standardization and risk reduction.

Disclosures. **All authors:** No reported disclosures.

2161. Prolonged and Inappropriate Central Line Utilization in Nursing Homes (NH) Related to Broad Spectrum Antibiotics

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Background. Continuation of intravenous therapy via peripherally inserted central catheters (PICCs) after hospitalization is a common reason for NH care. Little is known about timely removal of central lines after planned treatment is complete.

Methods. In this observational prospective cohort study of residents with PICCs at 6 NHs between September 4, 2015 and December 31, 2016, we evaluated reason for admission, antibiotic use and planned duration, PICC line indication and dwell time, and oral intake status.

Results. Among 420 residents with PICCs, the most common indication for PICC line use was antibiotics (77%), followed by 13% of patients who had no documented indication. Infection was cited as the primary reason for NH admission with a PICC in 79% (333) of residents; among these, sepsis (27%), skin/soft-tissue infection (24%), and osteomyelitis 19%) were the most common reasons. Among 324 patients on antibiotics, vancomycin (33%), piperacillin/tazobactam (21%), and carbapenem (12%) were most common and 77% of all antibiotics were broad spectrum. Average planned antibiotic therapy duration was 21 days (range 0–91). Mean dwell time for PICC lines was 31 days (range 1–300). Among 203 PICC lines where antibiotic stop dates were available, 77% remained in place >2 days despite completion of antibiotics; 54% remained >7 days and 36% remained more than 2 weeks without clear indication for intravenous access. Average duration of lines remaining in place despite discontinuation of antibiotics was 18 days (range 0–320). Overall, among lines remaining in place post-completion of antibiotics, the average extended duration was 18 days (range 0–320). NPO status was noted in 12% of residents.

Conclusion. We found that the vast majority of antibiotic use in NHs were broad spectrum agents. Additionally, inappropriately prolonged PICC presence post-antibiotic discontinuation occurred in three-quarters of those with PICC lines, often for several weeks. Strategies to ensure timely removal of central lines, such as daily documentation of line necessity, are urgently needed in the NH setting. Opportunities also exist for antibiotic stewardship interventions.

Disclosures. **S. K. Gohil**, Sage Products: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Xttrium Laboratories: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Clorox: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; **S. Tam**, Sage Products: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; 3M: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Xttrium Laboratories: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Clorox: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; **J. Chang**, Sage Products: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Xttrium Laboratories: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; Clorox: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product

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2162. Comparison of Midline *vs.* Central Venous Catheter-Related Bloodstream Infections: Are Midlines Safer Than Central Venous Lines?

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Background. With the rising use of midline catheters (MC), validation of their safety is essential. The objective of our study was to evaluate the incidence of bloodstream infections (BSI) and other complications related to the use of MC and central venous catheter (CVC).

Methods. A retrospective cohort study was performed from May-December 2016 at Detroit Medical Center, Detroit, MI. Adult patients were eligible for inclusion if they had either MC or CVC during hospitalization. Outcomes assessed were line-related BSI per the National Healthcare Service Network (NHSN) criteria, mechanical complications (nonfunctional line due to disruption in patency or dislodging), hospital length of stay, mortality and readmission within 90 days of discharge. Statistical analysis was performed using SAS software.

Results. A total of 312 patients with MC and 215 patients with CVC were analyzed. The mean age of cohort was 57 ± 17.4 years and 52% were females. Higher catheter-related BSIs (CRBSI) were seen in patients with CVC (7/215) compared with MC (1/312); (3.3 *vs.* 0.3%; $P = 0.009$). Among the CRBSI, alternative source of infection was identified in both MC (1/1) and CVC group (2/7). Two of the 7 CVC-related BSI were reported to NHSN. More mechanical complications were seen in MC (3.5%) compared with CVC group (0.4%) ($P = 0.03$). Patients with CVC had higher crude mortality (14% vs 6%, $P = 0.002$), readmission rate (51% vs 38%, $P = 0.004$) and line-related readmissions (5.7% vs 0.8%, $P = 0.05$) compared with MC group. Multivariate analysis showed female gender (OR 0.55, 95% CI 0.38–0.81), burns (OR 0.21, 95% CI 0.06–0.74), myocardial infarction (OR 0.17, 95% CI 0.08–0.36) and stay in the intensive care unit (OR 0.60, 95% CI 0.41–0.88) had higher likelihood to receive MC while CVC was more likely to be inserted in patients with chronic kidney disease (OR 2.86, 95% CI 1.84–4.44).

Conclusion. Patients with chronic kidney disease are more likely to get CVC and hence particular attention should be paid to prevent BSI through appropriate catheter care. MC are more common in patients with burns, myocardial infarction and in the intensive care unit. Larger studies are needed to understand if MC or CVC are independent predictors for BSI.

Disclosures. **All authors:** No reported disclosures.

2163. Predictors of Infections and Mortality in Adult Patients Undergoing Extracorporeal Membrane Oxygenation

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Background. Extracorporeal membrane oxygenation (ECMO) has been used in various clinical settings, such as acute respiratory distress syndrome, cardiogenic shock and refractory septic shock. One of the associated risks is acquisition of infections during bypass because of the multiple cannulation sites. The purpose of this study was to evaluate the predictors of healthcare associated infections (HAI) and mortality in adult patients on ECMO.

Methods. This was a retrospective descriptive study at a 1550 bed University-affiliated tertiary medical center in Miami, Florida. We looked at patients over 18 years old on ECMO for > 48 hours between January 1–August 31, 2016. The presence of an infection before ECMO placement or acquired during ECMO support were noted. Only culture- proven infections were included. The primary outcome was to identify risk factors associated with HAI or mortality.

Results. 40 patients undergoing ECMO during the study period were identified. 25 patients met the inclusion criteria and were included in the analysis. During a total of 364 ECMO days, 12 patients out of 25 had microbiologically proven infection (48 %). There were 7 ventilator associated pneumonias (41%), 5 bacteremias (29%), 2 pleural empyemas (12%), 2 Clostridium difficile colitis (12%) and 1 mediastinitis (6%). Candida species were the predominant blood isolates (60%). The rate of infection per 1,000 ECMO days was 46.7.

The overall in-hospital mortality was 64%. There was no impact of infection on mortality, length of ICU,or hospital stay. ECMO use for < 7 days was associated with overall less episodes of infection vs ECMO use for > 7 days. (P-value 0.0136, OR 0.089, CI: 0.01–0.6). Charlson-comorbidity score of 5 or more was associated with higher episodes of bacteremia ($P = 0.0023$, OR = 16, CI = 1.38–185.41).

Conclusion. Infections did not have an impact on mortality. Patients on ECMO for less than 8 days had less episodes of infections. Patients with Charlson-comorbidity index of 5 or more were associated with higher episodes of bacteremia. Further prospective cohort studies are necessary to address causality and to determine infection and mortality predictors that can be modified for patients undergoing ECMO.

Disclosures. **All authors:** No reported disclosures.

2164. To Be a CLABSI or Not to Be a CLABSI—That Is the Question: The Epidemiology of Bloodstream Infections in a Large ECMO Population

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Background. ECMO recipients who develop bloodstream infections (BSI) meeting CLABSI criteria are publically-reported in inter-facility comparisons and contribute to potential penalties from CMS. We aimed to determine the incidence of BSI, specifically CLABSI, following receipt of ECMO at one of the largest ECMO centers in the US.

Methods. Adults who received ECMO at Duke University Hospital from 1/1/2014–12/31/2016 were included in the study. Cases were patients who acquired BSI during the ECMO exposure period, defined as 2 days after cannulation through 7 days after decannulation. Electronic medical records of case patients were reviewed and data were abstracted using a standardized template. To calculate CLABSI incidence rates (IR), we assumed that all patients on ECMO had 1 or more central venous catheters (CVC) for the duration of ECMO.

Results. 426 patients received 3532 days of ECMO during the 3-year study period. 29 (6.8%) patients acquired BSI (IR 8.2 /1000 ECMO days (ED)) after a median ECMO duration of 7 (range 2, 39) days. Of these, 13 met criteria for primary CLABSI (IR 3.7/1000 ED), whereas 9 had a single blood culture (BC) positive for a common commensal organism and 7 had BSI secondary to pneumonia. Although ECMO patients only represented 8% of CVC days during the study period, they accounted for