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3M: Receipt of contributed product, Conducting studies in healthcare facilities that are receiving contributed product; R. D. Singh, 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; S. S. Huang, Sage Products: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributed product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributed product; Xttrium Laboratories: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributed product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributed product; Clorox: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributed product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributed product; 3M: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributed product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributed product; Molnlycke: Receipt of contributed product, Conducting studies in which participating healthcare facilities are receiving contributed product (no contribution in submitted abstract), Participating healthcare facilities in my studies received contributed product

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

Ammara Mushtaq, MD¹; Bhagyashri Navalkele, MD¹; Maninder Kaur, MD²; Aleena Saleem, MD²; Natasha Rana, BSc³; Sonia Gera, BSc³; Suganya Chandramohan, MD²; Malini Surapaneni, MD¹ and Teena Chopra, MD, MPH¹; Detroit Medical Center/Wayne State University, Detroit, Michigan, ²Detroit Medical Center, Detroit, Michigan, ³Wayne State University, Detroit, Michigan

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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.

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

Julia Bini Viotti, MD¹; Christina Cloke, MD¹; Mohammed Shaikhomer, MD¹; April Grant, MD²; Ali Ghodsizad, MD³; Nicolas Brozzi, MD³; Mathias Loebe, MD³ and Lilian M. Abbo, MD¹; ¹Infectious Disease, University of Miami-Jackson Memorial Hospital, Miami, Florida, ²Surgical Critical Care, University of Miami-Jackson Memorial Hospital, Miami, Florida, ³Cardiothoracic Surgery, University of Miami-Jackson Memorial Hospital, Miami, Florida

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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.

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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

Jessica Seidelman, MD^{1,2}; Sarah S. Lewis, MD MPH^{2,3}; Kirk Huslage, RN, BSN, MS^{2,4}; Nancy Stritholt, RN, BSN, CIC⁵; Sheila Vereen, RN BSN CIC⁵; Christopher Sova, RN, BSN⁴; Bonnie Taylor, RN, BSN, MPH⁴; Desiree Bonadonna, MPS, CCR, FPP⁶; David Ranney, MD⁷; Utlara Nag, MD⁷; Mani Daneshmand, MD⁸; Deverick Anderson, MD, MPH, FSHEA, FIDSA^{2,5}; Daniel Sexton, MD^{2,3,9,10} and Becky Smith, MD^{2,3}; ¹Division of Infectious Diseases and International Health, Department of Medicine, Duke University School of Medicine, Duke University, Durham, North Carolina, ²Duke Center for Antimicrobial Stewardship and Infection Prevention, Durham, North Carolina, ³Division of Infectious Diseases, Duke University Medical Center, Durham, North Carolina, ⁴Infection Prevention and Hospital Epidemiology, Duke University Medical Center, Durham, North Carolina, ⁵Duke University Medical Center, Durham, North Carolina, ⁶Department of Perfusion Services, Duke University Medical Center, Durham, North Carolina, ⁷Department of Surgery, Division of Cardiovascular and Thoracic Surgery Duke University Medical Center, Durham, North Carolina, ⁸Division of Cardiovascular and Thoracic Surgery, Duke University Medical Center, Durham, North Carolina, ⁹Duke Antimicrobial Stewardship Outreach Network, Durham, North Carolina, ¹⁰Duke Infection Control Outreach Network, Durham, North Carolina

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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