

Background: Gram-negative bacilli (GNB) bacteremia is a common and potentially fatal infection with mortality rates estimated to be 14-34%, despite effective antimicrobial treatments. Follow-up blood cultures (FUBCs) are blood cultures that are repeated after an initial positive culture and are indicated in certain clinical scenarios, such as in candidemia or *Staphylococcus aureus* bacteremia to ensure clearance of the bloodstream infection. FUBCs are used in bacteremia to assess the appropriateness and duration of antimicrobial therapy. Currently, there are no guidelines in place regarding the use of FUBC for GNB bacteremia. Furthermore, the utility of FUBCs is not well-studied in adults living with cancer. The purpose of this study is to identify risk factors associated with persistent GNB bacteremia in adult patients with cancer. **Methods:** We conducted a single-center, retrospective study in patients aged ≥ 18 years, hospitalized during calendar year 2022, living with cancer, and with laboratory confirmed GNB bloodstream infection. FUBC was defined as a blood culture performed within 7 days of the initial positive blood culture. Patients were grouped as having the same organism on FUBC (+/same), FUBC with no growth (NG) (+/NG), and different organism on FUBC (+/Different). Patients with a different organism on FUBC were excluded from analysis. We gathered demographic information, suspected source of bacteremia, type of malignancy, identified organisms, presence of antimicrobial resistance, and comorbidities (eg. presence of central venous catheters, urinary catheters, end-stage renal disease). Categorical variables were compared using Chi-square or Fisher's exact test. Continuous variables were compared using Wilcoxon rank sum tests. Logistic regression analysis was used to identify the independent predictors of persistent GNB bacteremia. **Results:** 356 unique patients with FUBC were identified after inclusion/exclusion criteria. 93/356 (26%) of patients had persistent GNB bacteremia (+/same). Multivariate analysis identified history of bacteremia within the preceding year (OR 2.95, 95% CI [1.6-5.6]) and *Achromobacter* spp. bacteremia (OR 10.03, 95% CI [1.59-63.23]) as independent risk factors for persistence. Organisms with multidrug resistance such as extended-spectrum beta-lactamase (OR 2.47, 95% CI [1.21-5.07]) and carbapenem-resistant organisms (OR 3.35, 95% CI [1.04-10.81]) were also associated with persistent GNB bacteremia. **Conclusions:** This is the first study to specifically identify risk factors for persistent GNB bacteremia in patients living with cancer. FUBC may be useful in GNB bacteremia with less common organisms and/or if they exhibit multidrug resistance on susceptibility testing. The utility of FUBC should be further explored in patients with cancer with certain risk factors.

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Carbapenem-resistant *Acinetobacter baumannii* and Carbapenem-resistant Enterobacterales in US Dialysis Populations, 2016-2021

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Background: Infections lead to high mortality among patients on chronic dialysis; knowledge of multi-drug resistant infections is limited. The Centers for Disease Control and Prevention's Emerging Infections Program (EIP) conducts laboratory- and population-based surveillance for carbapenem-resistant Enterobacterales (CRE) in 10 U.S. sites and carbapenem-resistant *Acinetobacter baumannii* (CRAB) in 9 U.S. sites. We investigated clinical characteristics, healthcare exposures, and outcomes of CRE and CRAB cases in persons on chronic dialysis from 2016-2021. **Methods:** Among EIP catchment-area residents on chronic dialysis, we defined a CRE case as the first isolation of *Escherichia coli*, *Enterobacter cloacae* complex, *Klebsiella aerogenes* (formerly *Enterobacter aerogenes*), *Klebsiella oxytoca*, *Klebsiella pneumoniae*, or *Klebsiella variicola* resistant to any carbapenem, from a normally sterile site or urine in a 30-day period. A CRAB case was defined as the first isolation of *Acinetobacter baumannii* complex resistant to any carbapenem (excluding ertapenem), from a normally sterile site or urine (or lower respiratory tract or wound since 2021) in a 30-day period. Medical records were reviewed. A case was considered colonized if the case culture had no associated infection type or colonization was documented in the medical record. Descriptive analyses, including analyses stratified by pathogen, were conducted. **Results:** Among 426 cases, 314 were CRE, and 112 were CRAB; most cases were male (235, 55.2%), Black (229, 53.8%), and 51-80 years old (320, 75.1%) (Table). An infection was associated with 363 (85.2%) case cultures; bloodstream infections (148; 40.8%), urinary tract infections (134; 36.9%), and pneumonia (17; 4.7%) were the most frequent. Overall, most cases had documented healthcare exposures (excluding outpatient dialysis) in the year before incident specimen collection, including: 366 (85.9%) hospitalizations, 235 (55.2%) surgeries, 209 (49.1%) long-term care facility stays, 54 (12.7%) long-term acute care facility stays. Additionally, 125 (29.3%) had an intensive care unit admission within the 7 days before incident specimen collection. Compared to CRE cases, a higher proportion of CRAB cases (a) had a long-term care facility stay (82/112 [73.2%] versus 127/314 [40.5%], $P < .0001$) or hospitalization (103/112 [92%] versus 263/314 [83.8%], $P = .03$) within the preceding year and (b) died within 30 days of incident specimen collection (40/112 [35.7%] versus 64/314 [20.4%], $P = .001$). **Discussion:** Among CRE and CRAB cases in persons on chronic dialysis, healthcare exposures were common, and mortality was high. Additional efforts to better describe the burden of these organisms and associated risk factors in the dialysis population are needed for tailoring infection prevention strategies to this vulnerable.

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Table: Carbapenem-Resistant Enterobacterales (CRE) vs Carbapenem-Resistant *Acinetobacter baumannii* (CRAB) cases in Persons on Chronic Dialysis

| Characteristic | | Total (n=426) No. (%) | CRE (n= 314) No. (%) | CRAB (n=112) No. (%) |
|-------------------------------|---|--------------------------|-------------------------|-------------------------|
| Colonized | Yes (colonization) | 54 (12.7) | 39 (12.4) | 15 (13.4) |
| | No (infection) | 363 (85.2) | 268 (85.4) | 95 (84.8) |
| | Unknown | 9 (2.1) | 7 (2.2) | 2 (1.8) |
| Sex | Male | 235 (55.2) | 179 (57.0) | 56 (50) |
| | Female | 191 (44.8) | 135 (43.0) | 56 (50) |
| Ethnicity* | Hispanic | 39 (9.2) | 36 (11.5) | 3 (2.7) |
| | Non-Hispanic | 343 (80.5) | 242 (77.1) | 101 (90.2) |
| | Unknown | 44 (10.3) | 36 (11.5) | 8 (7.1) |
| Race* | American Indian | 2 (0.5) | 2 (0.6) | 0 |
| | Asian | 11 (2.6) | 8 (2.6) | 3 (2.7) |
| | Black | 229 (53.8) | 152 (48.4) | 77 (68.8) |
| | White | 157 (36.9) | 125 (39.8) | 32 (28.6) |
| | Unknown | 27 (6.3) | 27 (8.6) | 0 |
| Age Categories (years) | 1-10 | 4 (0.9) | 4 (1.3) | 0 |
| | 11-20 | 5 (1.2) | 5 (1.6) | 0 |
| | 21-30 | 4 (0.9) | 4 (1.3) | 0 |
| | 31-40 | 23 (5.4) | 18 (5.7) | 5 (4.5) |
| | 41-50 | 41 (9.6) | 32 (10.2) | 9 (8.0) |
| | 51-60 | 90 (21.1) | 64(20.4) | 26 (23.2) |
| | 61-70 | 137 (32.2) | 91 (29.0) | 46 (41.1) |
| | 71-80 | 93 (21.8) | 70 (22.3) | 23 (20.5) |
| Prior healthcare exposures | ICU stay within 7 days prior to specimen collection | 125 (29.3) | 86 (27.4) | 39 (34.8) |
| | Hospitalization within year prior to specimen collection* | 366 (85.9) | 263 (83.8) | 103 (92.0) |
| | Surgery within year prior to specimen collection | 235 (55.2) | 174 (55.4) | 61 (54.5) |
| | LTCF stay within year prior to specimen collection* | 209 (49.1) | 127 (40.5) | 82 (73.2) |
| | LTACH stay within year prior to specimen collection | 54 (12.7) | 41 (13.1) | 13 (11.6) |
| Outcome* | Died within 30 days of specimen collection | 104 (24.4) | 64 (20.4) | 40 (35.7) |
| | Alive at 30 days after specimen collection | 322 (75.6) | 250 (79.6) | 72 (64.3) |
| Infection*† | Bloodstream infections | 148 (40.8) | 103 (38.4) | 45 (47.4) |
| | Urinary tract infections | 134 (36.9) | 121 (45.2) | 13 (13.7) |
| | Pneumonia | 17 (4.7) | 1 (0.4) | 16 (16.8) |
| | Other | 64 (17.6) | 43 (16.0) | 21 (22.1) |

LTACH=long-term acute care hospital; LTCF=long-term care facility; ICU=intensive care unit

*P-value <0.05

†Colonized cases removed from denominator: Total infections (n=363). Infections with CRE (n=268). Infections with CRAB (n=95).|