

Emerging Infections Program (EIP) Network Report Healthcare-Associated Infection Community Interface Multi-site Gram-negative Surveillance Initiative Carbapenem-Resistant *Acinetobacter baumannii* Complex (CRAB) Surveillance, 2013

EIP Areas:

Colorado (5 county Denver area); Georgia (8 county Atlanta area); Maryland (4 county Baltimore area); Minnesota (2 county Minneapolis – St. Paul area); New Mexico (1 county Albuquerque area); New York (1 county Rochester area); and Oregon (3 county Portland area).

Colorado, Maryland, New Mexico and New York were new surveillance areas in 2013.

Population:

The surveillance area represents 13,223,586 persons.

Source: National Center for Health Statistics bridged-race vintage 2013 file.

Case Definition:

A carbapenem-resistant *Acinetobacter baumannii-calcoaceticus* complex (CRAB) case was included in this report if there was isolation of *Acinetobacter* that is part of the *A. baumannii-calcoaceticus* complex meeting the following criteria:

- Carbapenem-resistant (doripenem [using FDA criteria], imipenem, meropenem) using the current Clinical and Laboratory Standards Institute (CLSI) clinical breakpoints (1);
- Isolated from either a normally sterile site (e.g., blood, cerebrospinal fluid, pleural fluid, pericardial fluid, peritoneal fluid, joint/synovial fluid, bone, internal body site, muscle) or urine;
- Identified in residents of the surveillance area in 2013.

Methodology:

Case finding was active, laboratory-based, and population-based. Clinical laboratories that serve residents of the surveillance area were routinely contacted for case identification through a query of minimum inhibitory concentration (MIC) values from automated testing instruments. When possible, the MIC values obtained directly from the automated testing instruments were used to determine if an isolate met the phenotypic case definition. An incident CRAB case was defined as the first CRAB isolate meeting the case definition from a patient during a 30-day period.

A standardized case report form was completed for each incident case through review of medical records. Inpatient and outpatient medical records were reviewed for information on patient demographics, clinical syndrome, outcome of illness, and relevant healthcare exposures.

Isolates were not collected as part of this activity in 2013.

Incidence rates for CRAB cases were calculated using the 2013 US Census estimates of the surveillance area population as the denominator. Cases with unknown race (2.7% in 2013) were assigned race based on distribution of known age, race and gender by EIP site. Assessment of vital status in patients admitted to a hospital occurred at the time of discharge from the acute care hospital. For patients in a long-term care facility, long-term acute care facility, or in an outpatient dialysis center, vital status was

assessed 30 days after culture collection. For all other patients, vital status was assessed using medical records from the healthcare facility encounter associated with the culture.

CRAB surveillance data underwent regular data cleaning to ensure accuracy and completeness. Patients with complete case report form data as of 4/9/2021 were included in this analysis. Because data can be updated as needed, analyses of datasets generated on a different date may yield slightly different results.

Results:

Table 1: Incidence Rates of CRAB Cases by Sex, Race and Age (N=184), 2013

| Sex | Incidence Rate/100,000 Population | 95% CI |
|------------|--|---------------|
| Female | 0.89 | 0.86, 0.92 |
| Male | 1.92 | 1.89, 1.95 |

| Race | Incidence Rate/100,000 Population | 95% CI |
|---------------------------|--|---------------|
| White | 0.74 | 0.71, 0.76 |
| Black or African American | 3.92 | 3.85, 3.99 |
| Other ^a | 0.10 | 0.01, 0.68 |

| Age groups, years | Incidence Rate/100,000 Population | 95% CI |
|-----------------------------------|--|---------------|
| 0–49 | 0.89 | 0.85, 0.92 |
| 50–64 | 2.42 | 2.34, 2.50 |
| 65–79 | 4.35 | 4.18, 4.52 |
| ≥80 | 4.95 | 4.49, 5.46 |
| Invasive cases^b | 0.36 | 0.34, 0.37 |
| All cases | 1.39 | 1.38, 1.41 |

^aThe number of cases is not included because of small numbers.

^bOther race includes Asian, American Indian or Alaska Native.

^cInvasive cases include cases with a sterile incident specimen source or an incident urine specimen with a subsequent non-incident sterile specimen collected on the date of incident specimen collection or in the 29 days after.

Table 2. Clinical Characteristics and Infection Types for Incident CRAB Cases (N=184), 2013^a

| No. of Immunocompromised ^b Cases | % |
|---|-----|
| 7 | 3.8 |

| Infection types | No. of Cases | % |
|--------------------------------------|--------------|------|
| Urinary tract infection ^c | 92 | 50.0 |
| Bacteremia ^d | 41 | 22.3 |
| Septic shock | 13 | 7.1 |
| Pneumonia | 8 | 4.3 |
| Osteomyelitis | 6 | 3.3 |
| Other infection types | 22 | 12.0 |
| None ^e | 21 | 11.4 |
| Unknown | 21 | 11.4 |

^aPatients could have more than one type of infection reported.

^bImmunocompromised includes solid organ transplant recipients and patients with a documented diagnosis of AIDS or a hematologic malignancy.

^cAmong 92 cases with a documented urinary tract infection (UTI), 56 (60.9%) had signs and symptoms associated with a UTI documented in the medical record. Reported signs and symptoms included fever, dysuria, frequency, urgency, costovertebral angle pain or tenderness, and suprapubic tenderness.

^dBacteremia includes cases with a positive blood specimen (incident or non-incident) or a documented diagnosis of sepsis, septicemia, bacteremia, or blood stream infection.

^eNo infection types reported.

Table 3. Patient Location Before, During, and After Incident Specimen Collection Among Incident CRAB Cases (N=184), 2013

| Residence before incident specimen collection | No. of Cases | % |
|---|--------------|------|
| Long-term care facility | 86 | 46.7 |
| Acute care hospital (inpatient) | 45 | 24.5 |
| Private residence | 34 | 18.5 |
| Long-term acute care hospital | 11 | 6.0 |
| Other or Unknown | 8 | 4.3 |

| Collection location | No. of Cases | % |
|--|--------------|------|
| Acute care hospital | 69 | 37.5 |
| Outpatient setting or emergency department | 66 | 35.9 |
| Long-term care facility | 38 | 20.7 |
| Long-term acute care hospital | 10 | 5.4 |
| Unknown | 1 | 0.5 |

| Hospitalized on the day of or in the 29 days after the date of incident specimen collection | No. of Cases | % |
|--|---------------------|----------|
| Hospitalized | 129 | 70.1 |
| Not hospitalized | 47 | 25.5 |
| Unknown | 8 | 4.3 |

| Discharge location among hospitalized patients (N=129) | No. of Cases | % |
|---|---------------------|----------|
| Long-term care facility | 63 | 48.8 |
| Private residence | 33 | 25.6 |
| Died during hospitalization | 24 | 18.6 |
| Long-term acute care hospital | 8 | 6.2 |
| Unknown | 1 | 0.8 |

Table 4. Outcome of CRAB Cases (N=184), 2013

| Outcome | No. of Cases | % |
|--|---------------------|----------|
| ICU admission in the 6 days after the date of incident specimen collection | 49 | 26.6 |
| Died | 29 | 15.8 |
| Cases with a positive incident sterile site specimen (N=47) | 19 | 40.4 |
| Cases with a positive incident urine specimen (N=137) | 10 ^a | 7.3 |

^aNo cases had a subsequent non-incident blood specimen collected on the date of incident specimen collection or in the 29 days after.

Table 5. Selected Characteristics of Incident CRAB Cases (N=184), 2013^a

| Healthcare facility stay in the year before the date of incident specimen collection | No. of Cases | % |
|---|---------------------|----------|
| Acute care hospital | 138 | 75.0 |
| Long-term care facility | 122 | 66.3 |
| Long-term acute care hospital | 27 | 14.7 |

| Exposure | No. of Cases | % |
|---|---------------------|----------|
| Surgery in the year before the date of incident specimen collection | 60 | 32.6 |
| In ICU in the 7 days before the date of incident specimen collection | 27 | 14.7 |
| Specimen collected ≥ 3 days after hospital admission | 43 | 23.4 |
| Chronic dialysis | 21 | 11.4 |
| Selected medical devices) in place in the 2 calendar days before the date of incident specimen collection | 147 | 79.9 |
| Urinary catheter | 119 | 64.7 |
| Central venous catheter | 53 | 28.8 |
| Other ^b | 82 | 44.6 |

^aPatients could have more than one prior healthcare risk factor reported.

^bOther medical devices include endotracheal or nasotracheal tube, tracheostomy, gastrostomy tube, nephrostomy tube, nasogastric tube.

Summary:

In 2013, 184 incident cases of CRAB were identified, representing 172 unique case-patients. The overall crude incidence rate of CRAB was 1.39 cases per 100,000 persons, with higher incidence in men than women, and higher incidence in persons of Black or African American race compared to other races. The incidence rate of CRAB increased with age.

Urinary tract infections were the most common infection type reported. Isolates were most commonly collected while a patient was in the acute care hospital setting, and patients were most commonly located in the long-term care setting prior to their incident specimen collection.

Most cases required hospitalization with 27% requiring ICU admission. Overall, crude mortality was 16%, and higher in patients who had their CRAB isolates from a sterile site specimen source compared to a patient with a urine specimen source.

The most common prior healthcare exposures reported included presence of an indwelling medical device, hospitalization in the prior year, and prior long-term care facility residency being the most common exposures.

References:

1. Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing: twenty-third informational supplement. M100-S23. Wayne PA: The Institute; 2013.

Citation:

Centers for Disease Control and Prevention. 2022. Emerging Infections Program, Healthcare-Associated Infections – Community Interface Carbapenem-Resistant *Acinetobacter baumannii* Complex CRAB Surveillance Report, Multi-site Gram-negative Surveillance Initiative MuGSI, 2013. Available at: <https://www.cdc.gov/hai/eip/pdf/mugsi/2013-CRAB-Report-508.pdf>