NATIONAL CENTER FOR EMERGING AND ZOONOTIC INFECTIOUS DISEASES

Factors Associated with Failure to Clear Candidemia Infection: Surveillance Data from Eight States, 2017

David H. Oh[1,2]; Emma Seagle[1,3]; Shawn Lockhardt[1]; Joelle Nadle[4]; Devra Barter[5]; Helen Johnston[5]; Monica Farley[6]; Brittany Pattee[7]; Erin Phipps[8]; Brenda Tesini[9]; Alexia Zhang[10]; William Schaffner[11]; Brendan Jackson[1]; Meghan Lyman[1]

[1]Centers for Disease Control and Prevention, Mycotic Disease Branch, Atlanta, GA, [2]Tufts University School of Medicine, Boston, MA , [3]IHRC, Inc., Atlanta, GA, [4]California Emerging Infections Program, Oakland, CA, [5]Colorado Department of Public Health and Environment, Denver, CO, [6]Emory University School of Medicine and the Atlanta VA Medical Center, Atlanta, GA, [7]Minnesota Department of Health, St. Paul, MN, [8]University of New Mexico, Albuquerque, NM, [9]New York Emerging Infections Program, Rochester, NY, [10]Oregon Health Authority, Portland, OR, [11]Vanderbilt University School of Medicine, Nashville, TN

BACKGROUND

- Candidemia is a bloodstream infection commonly associated with high morbidity and mortality
- Failure to clear candidemia can lengthen hospitalization and treatment
- There is insufficient evidence regarding factors associated with candidemia clearance
- Primary aim: to determine factors associated with failure to clear candidemia infection using national data

METHODS

- Data source: Emerging Infections Program (EIP), a network of 10 state health departments and other stakeholders for population-based candidemia surveillance
- Data from eight EIP sites included: counties in California, Colorado, Georgia, Minnesota, New Mexico, New York, Oregon, and Tennessee
- Clearance definition: having a blood culture negative for *Candida* species ≤30 days after initial culture date (ICD) positive for *Candida* spp.
- Exclusion: unknown clearance (due to limited follow-up ability), unknown survival outcome, or death ≤30 days of ICD
- Bivariate analysis using chi-square tests and multivariable logistic regression to calculate adjusted odds ratios (aOR) using backward selection (p-value<0.10)

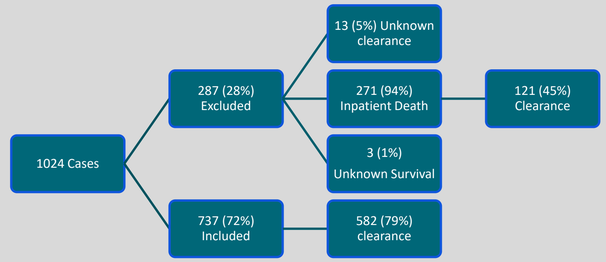
SCAN HERE FOR MORE INFORMATION

Table 1. Bivariate associations between cases with documented candidemia clearance and those without documented clearance for select variables

Characteristic	No Documented Clearance (N=166)	Documented Clearance (N=582)	P-value
Female	80 (51.6)	264 (45.4)	0.307
Race			
White	96 (61.9)	383 (65.8)	0.568
Black	44 (28.4)	133 (22.9)	
Asian	4 (2.6)	10 (1.7)	
Native Hawaiian / Pacific Islander	0 (0)	4 (0.7)	
American Indian	1 (0.7)	5 (0.9)	
Unknown	10 (6.5)	47 (8.1)	
CVC(s) present ≤2 days prior to ICD (yes)	75 (48.4)	397 (68.2)	**<0.001**
CVC(s) removed/changed within 7 days after ICD (yes)	45 (58.4)	322 (80.7)	**<0.001**
Systemic antifungal(s) within 14 days before ICD (yes)	96 (61.9)	547 (94.0)	**<0.001**
Systemic antifungal(s) to treat candidemia (yes)	55 (35.5)	344 (59.1)	**<0.001**
Candida species			
C. albicans	56 (36.1)	239 (41.1)	0.308
C. glabrata	51 (32.9)	155 (26.6)	
C. krusei	1 (0.7)	9 (1.6)	
C. lusitaniae	4 (2.6)	13 (2.2)	
C. parapsilosis	24 (15.5)	93 (16.0)	
C. tropicalis	8 (5.2)	44 (7.6)	
Other	9 (5.8)	28 (4.8)	
Candida, gram tube negative / non *C. albicans*	0 (0)	0 (0)	
Candida species	2 (1.3)	1 (0.2)	
Preadmission location prior to candidemia-associated hospital stay			
Hospital inpatient (admitted from another hospital)	10 (7.1)	16 (2.8)	**0.012**
Total parenteral nutrition	21 (13.6)	151 (26.0)	**0.001**
Neutropenia	3 (1.9)	19 (3.3)	0.658

In addition to the variables listed here, intensive care unit <14 days before ICD, surgery <90 days before ICD, and candida infection at other body sites were included in the multivariable logistic regression model using backward selection.

RESULTS



- Multivariable model: clearance was less likely among Black patients (aOR 0.51, 95% confidence interval [CI] 0.29-0.91) and those admitted from another hospital (aOR 0.28, 95% CI 0.11-0.75)

CONCLUSIONS

- Failure to clear candidemia was associated with Black race and prior hospital exposure
- May reflect illness severity, access to care, and obstacles to effective treatment
- Further research is necessary to determine reasons behind failure to clear candidemia

ACKNOWLEDGEMENTS

We would like to thank the surveillance officers at each of the EIP sites for their hard work in data collection, and the CDC Epi-elective Program

CONTACT INFO
Meghan Lyman, yeo4@cdc.gov