colistin and tigecycline, compared with surviving patients (Table 1). Genotype, colistin MIC, and colistin resistance were not associated with mortality (Figure 1 and 2). In multivariable analysis, neutropenia (aOR, 3.25; 95% CI, 1.18–8.95), catheter-related infection (aOR, 0.33; 95% CI, 0.11–0.99), biliary tract infection (aOR, 0.20; 95% CI, 0.04–0.99), a high Pitt bacteremia score (aOR,1.42; 95% CI, 1.20–1.67), and combination therapy with colistin and tigecycline (aOR, 0.36; 95% CI, 0.14–0.92) were independent risk factors for mortality (Table 2).

Conclusion. Clinical factors such as the site of infection, severity of bacteremia, and specific combination therapy rather than microbiologic factors contributed to mortality in CRAB bacteremia. Appropriate combination therapy may help improving outcomes in CRAB bacteremia.

Table 1. Clinical and microbiologic characteristics and management of CRAB bacteremia, according to 30-day mortality

Characteristic of patients or isolates	Deceased patients (n = 90)	Surviving patients (n = 74)	P value
Age, mean years ± SD	62.1 ± 16.0	65.6 ± 12.7	0.12
Male gender	58 (64)	53 (72)	0.33
Underlying disease/condition			
Hematologic malignancy	33 (37)	13 (18)	0.01
Solid tumor	18 (20)	26 (35)	0.03
Chronic kidney disease	10 (11)	14 (19)	0.16
Chronic obstructive pulmonary disease	8 (9)	4 (5)	0.39
Recent chemotherapy	30 (33)	15 (20)	0.06
Recent surgery	20 (22)	18 (24)	0.75
Immunosuppressant use	13 (14)	15 (20)	0.32
Steroid use	31 (34)	15 (20)	0.04
Neutropenia	32 (36)	7 (10)	<0.001
Ventilator care	46 (51)	36 (49)	0.75
Charlson comorbidity index, mean score ± SD	3.6 ± 2.5	4.4 ± 2.9	0.07
Type of infection			
Catheter-related infection	6 (7)	15 (20)	0.01
Intraabdominal infection	11 (12)	12 (16)	0.46
Biliary tract infection	2 (2)	17 (23)	<0.001
Pneumonia	48 (53)	19 (26)	<0.001
Skin & soft tissue infection	5 (6)	4 (5)	1.00
Primary bacteremia	18 (20)	5 (7)	0.02
Septic shock	67 (74)	20 (27)	<0.001
Pitt bacteremia score, mean score ± SD	4.7 ± 3.2	1.7 ± 1.8	<0.001
CRAB isolate characteristic			
Colistin susceptibility			
MIC ≤0.5 mg/L	55 (61)	36 (49)	0.11
MIC 1.0 mg/L	26 (29)	23 (31)	0.76
MIC 2.0 mg/L	3 (3)	9 (12)	0.03
MIC ≥4.0 mg/L	6 (7)	6 (8)	0.72
Multilocus sequence type			
ST191	43 (48)	37 (50)	0.78
ST451	13 (14)	10 (14)	0.86
ST784	13 (14)	9 (12)	0.67
Other	21 (23)	18 (24)	0.88
Inappropriate empirical treatment	61 (68)	47 (64)	0.57
Inappropriate definitive treatment	36 (40)	12 (16)	0.01
Appropriate definitive treatment	54 (60)	62 (84)	0.01
Colistin use for definitive treatment	43 (48)	50 (68)	0.01
Combination therapy for definitive treatment	48 (53)	47 (64)	0.19
Colistin containing regimen	40 (44)	40 (54)	0.22
Tigecycline containing regimen	19 (21)	24 (32)	0.10
Colistin and tigecycline containing regimen	13 (14)	20 (27)	0.04

Table 2. Result of analyses of risk factors for mortality in patients with CRAB bacteremia

Risk factor	Univariate analysis result		Multivariable analysis result	
	Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Solid tumor	0.46 (0.23 – 0.93)	0.03		
Hematologic malignancy	2.72 (1.30 – 5.67)	0.01		
Neutropenia	5.28 (2.17 – 12.86)	<0.001	3.25 (1.18 – 8.95)	0.02
Catheter-related infection	0.28 (0.10 – 0.77)	0.01	0.33 (0.11 – 0.99)	0.04
Biliary tract infection	0.08 (0.02 – 0.34)	0.01	0.20 (0.04 – 0.99)	0.04
Pneumonia	3.31 (1.70 – 6.44)	<0.001		
Primary infection	3.45 (1.21 – 9.80)	0.02		
Septic shock	7.87 (3.91 – 15.81)	<0.001		
Pitt bacteremia score	1.53 (1.31 – 1.78)	0.01	1.42 (1.20 – 1.67)	<0.001
Inappropriate definitive treatment	3.44 (1.63 – 7.28)	0.01		
Colistin use for definitive treatment	0.44 (0.23 – 0.83)	0.01		
Combination therapy with colistin and tigecycline	0.46 (0.21 – 0.99)	0.04	0.36 (0.14 – 0.92)	0.03
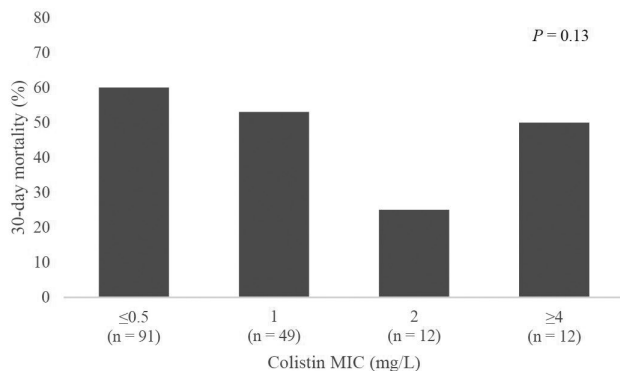
Figure 1. 30-day mortality according to colistin MIC of CRAB blood isolates
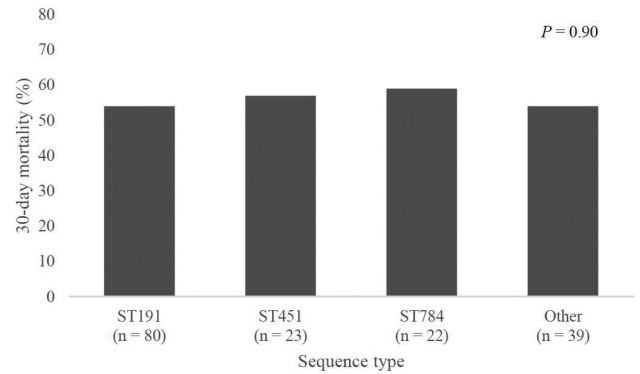
Figure 2. 30-day mortality according to genotype of CRAB blood isolates

136. Factors Associated with Reduced Vancomycin Susceptibility in Pediatric Staphylococcus aureus Bacteremia

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Background. Vancomycin is often used empirically for treatment of pediatric *Staphylococcus aureus* bacteremia while susceptibility testing is being performed. Reduced vancomycin susceptibility (RVS) occurs when the minimum inhibitory concentration (MIC) for vancomycin is elevated, potentially resulting in decreased efficacy. Patient factors associated with RVS in pediatric *S. aureus* infections have not been well studied.

Methods. Children aged <18 years admitted from 2012 to 2016 to two tertiary care children's hospitals with a blood culture positive for *S. aureus* were identified. Demographics, presence of comorbidities, hospitalizations in the year prior to the infection, surgical procedures in the 30 days prior to the infection, presence of a central venous catheter at diagnosis and methicillin-resistant (MRSA) vs. methicillin-susceptible *S. aureus* (MSSA) were abstracted from the electronic medical record using a structured data collection form. RVS was defined as a MIC >1 μg/mL as reported by the clinical microbiology laboratory. Wilcoxon rank-sum and Fisher's exact test to compare continuous and categorical variables, respectively. A multivariable logistic regression model was used to evaluate the association of RVS with patient factors, MRSA vs. MSSA, admitting hospital, and year.

Results. We identified 221 *S. aureus* bloodstream infections. Most (84%) had RVS though there were differences by the hospital, 74% vs. 87%, P = 0.037. Bloodstream infections in the setting of a musculoskeletal infection were most common (36%), followed by central line-associated bloodstream infections (22%). The median age was similar between RVS and non-RVS infections, 3 (25th, 75th %tiles: 0, 9) vs. 5 (0, 12) but, when adjusted for patient factors, younger children were more likely to have RVS infections than older children, aOR: 0.92 (0.85, 0.99). Black children were more likely to have RVS than white children on both univariate and adjusted analyses (table).

Conclusion. RVS is common among pediatric *S. aureus* bloodstream infections and appears to be influenced by patient age and race but not by the source of the infection or other clinical factors.

	Vancomycin MIC ≤1 μg/mL N=36 (16%)	Vancomycin MIC >1 μg/mL N=185 (84%)	aOR (95% CI)	P*
Age, years	4.5 (0, 12)†	3 (0, 9)†	0.92 (0.85, 0.99)	0.03
Male sex	25 (69)	123 (66)	0.69 (0.29, 1.63)	0.40
Race				
White	19 (53)	65 (35)	1	-
Black	5 (14)	75 (41)	3.61 (1.10, 11.86)	0.04
Other/Not reported	12 (33)	45 (24)	0.65 (0.24, 1.77)	0.40
Any comorbidity	24 (67)	110 (59)	0.85 (0.22, 3.25)	0.82
Surgery in prior 30 days	6 (17)	30 (16)	1.21 (0.35, 4.15)	0.76
Hospitalization in prior year	21 (58)	74 (40)	0.40 (0.13, 1.21)	0.11
MRSA	8 (22)	35 (19)	0.42 (0.14, 1.21)	0.11
Primary source				
CLABSI or endovascular	12 (33)	44 (24)	1	
Musculoskeletal	12 (33)	67 (36)	1.13 (0.25, 5.11)	0.87
Skin or soft tissue	6 (17)	26 (14)	0.76 (0.16, 3.57)	0.72
Pneumonia	2 (6)	13 (7)	2.74 (0.39, 19.13)	0.31
None or other	4 (11)	34 (18)	2.58 (0.61, 10.91)	0.20
Site				
Penn State Children's Hospital	15 (26)	43 (74)	1	-
Children's National Medical Center	21 (13)	142 (87)	1.53 (0.60, 3.90)	0.37

MIC: minimum inhibitory concentration; aOR: adjusted odds ratio; CI: confidence interval; CLABSI: central line associated bloodstream infection; *P value for aOR; †median (25th, 75th percentiles)

137. Impact of Rapid Susceptibility Testing on Outcomes in Patients with Bacteremia

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