

Clinical characteristics of patients who acquired Gram-negative bacteria during ceftazidime-avibactam therapy

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Supplementary Table 1. Antimicrobial susceptibility results of the acquired**Gram-negative bacteria after ceftazidime/avibactam (CZA) therapy**

Pathogen and antibiotic(s)	No. of susceptible isolates/total no. of isolates (%)
<i>Elizabethkingia</i> species ^a	
Ceftazidime	3/15 (20.0%)
Cefoperazone/sulbactam	5/15 (33.3%)
Cefepime	0/15 (0)
Imipenem	3/15 (20.0%)
Levofloxacin	2/15 (13.3%)
Trimethoprim/sulfamethoxazole	14/15 (93.3%)
<i>Acinetobacter</i> species ^b	
Piperacillin/tazobactam	3/12 (25.0%)
Ceftazidime	4/12 (33.3%)
Cefoperazone/sulbactam	7/12 (58.3%)
Cefepime	4/12 (33.3%)
Doripenem	3/12 (25.0%) ^c
Imipenem	3/12 (25.0%) ^c
Meropenem	4/12 (33.3%)
Amikacin	3/8 (37.5%)
Ciprofloxacin	5/12 (41.7%)
Levofloxacin	4/12 (33.3%)
Tigecycline	8/12 (66.7%)
Colistin	12/12 (100%)
<i>Burkholderia cenocepacia</i>	
Ceftazidime	10/11 (90.9%)
Trimethoprim/sulfamethoxazole	9/11 (81.8%)
Meropenem	8/11 (72.7%)
Minocycline	8/11 (72.7%)
<i>Serratia marcescens</i>	
Flomoxef	0/7 (0%)
Cefazolin	0/7 (0%)
Cefuroxime	0/7 (0%)
Cefmetazole	0/7 (0%)
Ceftazidime	0/7 (0%)
Ceftriaxone	0/7 (0%)

Cefoperazone/Sulbactam	1/7 (14.3%)
Cefepime	0/7 (0%)
Amikacin	7/7 (100%)
Gentamicin	7/7 (100%)
Ciprofloxacin	0/7 (0%)
Levofloxacin	0/7 (0%)
Trimethoprim/Sulfamethoxazole	4/7 (57.1%)
Ertapenem	1/6 (16.7%)
Imipenem	0/6 (0%)
<i>Stenotrophomonas maltophilia</i>	
Levofloxacin	5/6 (83.3%)
Trimethoprim/Sulfamethoxazole	6/6 (100%)
Minocycline	6/6 (100%)

^a Includes *Elizabethkingia anopheles* (n=11), *Elizabethkingia meningoseptica* (n=3), and *Elizabethkingia miricola* (n=1)

^b Includes *A. nosocomialis* (n=7), *A. lwoffii* (n=2), *A. baumannii* (n=2), *A. johnsonii* (n=1), and *A. pittii* (n=1)

^c Among 12 *Acinetobacter* species available for antimicrobial susceptibility test, 9 strains were carbapenem-resistant (75%) (5 *A. nosocomialis* strains, 2 *A. baumannii*, *Acinetobacter johnsonii* and *A. pittii*)

Supplementary Table 2. CZA susceptibility among Gram negative bacteria

acquired during or after CZA therapy

Gram negative bacteria acquired during CZA therapy	No.	No. of CZA-susceptible isolates/no. of isolates available (%)
<i>Elizabethkingia</i> species		
<i>Elizabethkingia anopheles</i>	11	Intrinsically resistant
<i>Elizabethkingia meningoseptica</i>	3	Intrinsically resistant
<i>Elizabethkingia miricola</i>	1	Intrinsically resistant
<i>Acinetobacter</i> species		
<i>Acinetobacter nosocomialis</i> ^a	7	4/7 ceftazidime-susceptible ^b
Carbapenem-resistant <i>Acinetobacter</i>	2	Not available ^b
<i>baumannii</i>		
<i>Acinetobacter lwoffii</i>	2	Not available ^b
Carbapenem-resistant <i>Acinetobacter</i>	1	Not available ^b
<i>johnsonii</i>		
Carbapenem-resistant <i>Acinetobacter</i>	1	Not available ^b
<i>pittii</i>		
<i>Burkholderia cenocepacia</i>	11	10/11 ceftazidime-susceptible ^b
<i>Stenotrophomonas maltophilia</i>	6	Intrinsically resistant
<i>Chryseobacterium indologenes</i>	5	Intrinsically resistant
<i>Enterobacterales</i>		
<i>Serratia marcescens</i>	7	0/3 (0%)
<i>Enterobacter hormaechei</i>	2	1/1 (100%)
<i>Klebsiella oxytoca</i>	1	0/1 (0%)
<i>Klebsiella pneumoniae</i>	1	0/1 (0%)
<i>Klebsiella variicola</i>	1	Not available
<i>Citrobacter freundii</i>	1	0/1 (0%)
<i>Morganella morganii</i>	1	Not available
<i>Ralstonia</i>		
<i>Ralstonia insidiosa</i>	1	Not available ^b
<i>Ralstonia mannitolilytica</i>	2	Not available ^b
<i>Pseudomonas aeruginosa</i>	1	1/1 (100%)
Gram negative bacteria acquired after CZA therapy		No. of CZA-susceptible isolates/no. of isolates available (%)
<i>Stenotrophomonas maltophilia</i> ^a	7	Intrinsically resistant
<i>Chryseobacterium indologenes</i>	3	Intrinsically resistant

<i>Elizabethkingia anopheles</i>	2	Intrinsically resistant
<i>Pseudomonas aeruginosa</i>		
Multidrug resistant	2	Not available
Difficult-to-treat	2	Not available
<i>Burkholderia</i> species		
<i>Burkholderia cepacian</i>	1	ceftazidime-susceptible ^b
<i>Burkholderia cenocepacia</i>	1	ceftazidime-susceptible ^b
<i>Enterobacterales</i>		
<i>Serratia marcescens</i> (CRE)	1	0/1 (0%)
<i>Enterobacter hormaechei</i> (CRE)	1	Not available
<i>Klebsiella pneumoniae</i> (CRE)	1	1/1 (100%)
MDR- <i>Citrobacter freundii</i>	1	Not available
<i>Klebsiella oxytoca</i> (CRE)	1	Not available
<i>Enterobacter cloacae</i> (CRE)	2	Not available
<i>Acinetobacter</i> species		
Carbapenem-resistant <i>Acinetobacter</i>	4	Not available ^b
<i>baumannii</i>		
<i>Acinetobacter baumannii</i> complex	1	Not available ^b
<i>Acinetobacter schindleri</i>	1	ceftazidime-susceptible ^b
<i>Achromobacter</i> species	1	Not available ^b
<i>Ralstonia mannitolilytica</i>	1	Not available ^b

Abbreviations: CZA, ceftazidime-avibactam; CRE, carbapenem-resistant

Enterobacterales; MDR, multidrug-resistant.

^a 5 *A. nosocomialis* strains were carbapenem-resistant

^b No breakpoints are available for ceftazidime-avibactam

Supplementary Table 3. Univariate and multivariable Logistic regression analysis of risk factors of Gram-negative bacteria acquisition during CZA use and/or after completion of CZA use

Variable	Univariate		Multivariable	
	OR (95% CI)	P value	OR (95% CI)	P value
ICU stay	3.67 (2.14-6.30)	<0.001	2.41 (1.20-4.82)	0.013
Diabetes mellitus	1.93 (1.15-3.25)	0.013	2.26 (1.26-4.03)	0.006
Mechanical ventilation	5.11 (2.84-9.19)	<0.001	5.14 (2.21-11.95)	<0.001
Urinary tract infection	0.21 (0.07-0.61)	0.004		
Bacteremia	2.24 (1.23-4.06)	0.008	2.10 (1.08-4.07)	0.028
SOFA score	1.08 (1.02-1.16)	0.012		
APACHE II score	1.05 (1.02-1.09)	0.005		

Abbreviations: ICU, intensive care unit; SOFA, sequential organ failure assessment; APACHE, Acute Physiology and Chronic Health Evaluation.