Table

Organism (n)	% Susceptible							
Gram negative	**CZA**	**CT**	**TGC**	**AMK**	**FEP**	**LVX**	**MEM**	**TZP**
Enterobacterales (185,287)	98.9	89.6	96.1	97.4	79.0	71.3	96.3	84.9
CRE (5,976)	71.7	2.6	91.7	62.7	3.3	9.4	0	3.0
ESBL+ (31,505)	96.4	67.7	94.8	90.5	27.8	31.8	87.8	55.0
P. aeruginosa (44,346)	91.7	90.3	na	91.7	77.9	62.4	72.2	74.4
Acinetobacter spp. (19,640)	na	na	na*	61.2	47.7	48.9	51.2	47.1
Gram positive	**CPT**	**LNZ**	**TGC**	**AMP**	**ERY**	**LVX**	**VAN**	
Enterococcus spp. (22,861)	na	99.0	98.2	67.7	12.0	49.5	87.6	
S. aureus, MSSA (45,227)	>99.9	>99.9	99.7	na	75.6	92.0	100.0	
S. aureus, MRSA (46,471)	89.2	>99.9	98.8	na	31.0	32.6	>99.9	

ESBL+, extended-spectrum β-lactamase positive; CRE, carbapenem-resistant Enterobacterales (MEM [meropenem] MIC >2 µg/mL;
na, no breakpoint; CZA, ceftazidime-avibactam; CT, ceftolozane-tazobactam; TGC, tigecycline; AMK, amikacin; FEP, cefepime; LVX,
levofloxacin; TZP, piperacillin-tazobactam; CPT, ceftaroline; LNZ, linezolid; AMP, ampicillin; ERY, erythromycin; VAN, vancomycin

* MIC_{90} = 2 µg/mL

Conclusion. Ceftazidime-avibactam, ceftolozane-tazobactam, tigecycline, meropenem, and amikacin all showed good activity against a global collection of Enterobacterales. Ceftaroline, tigecycline, linezolid and vancomycin all exhibited excellent activity against gram-positive isolates. Continued monitoring of susceptibility patterns among common pathogens will provide useful information for determining treatment strategies.

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1595. Ceftobiprole Activity against Gram-Positive Pathogens Causing Bone and Joint Infections in the United States from 2016 through 2019

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. Bone and joint infections (BJIs) cause serious morbidity and mortality and present significant treatment challenges. Ceftobiprole medocaril, the prodrug of ceftobiprole, is an advanced cephalosporin approved in many European and non-European countries for the treatment of adults with community- and hospital-acquired pneumonia, excluding ventilator-associated pneumonia. Ceftobiprole medocaril is not approved in the United States (USA) but has qualified infectious disease product (QIDP) status, and is being evaluated in two phase 3 clinical trials in patients with acute bacterial skin and skin structure infections (completed) or *Staphylococcus aureus* bacteremia (ongoing). In this study, the activity of ceftobiprole and comparators was evaluated against recent Gram-positive clinical isolates collected from BJIs in the USA.

Methods. 306 Gram-positive pathogens were collected from patients with BJIs at 27 US medical centers from 2016 through 2019. Susceptibility to ceftobiprole and comparator agents was tested using current CLSI methods. CLSI and EUCAST interpretive criteria were applied according to current guidelines.

Results. The major Gram-positive species and pathogen groups included *S. aureus* (67.0%; methicillin-resistant *S. aureus* [MRSA], 35.1%), β-hemolytic streptococci (BHS; 13.7%), coagulase-negative staphylococci (CoNS; 9.5%), and *Enterococcus faecalis* (6.9%). Ceftobiprole was highly active against *S. aureus* ($MIC_{50/90}$ values, 0.5/1 mg/L; 100.0% susceptible by EUCAST criteria), including MRSA ($MIC_{50/90}$ values, 1/2 mg/L). Ceftobiprole also exhibited potent activity against other Gram-positive cocci, including BHS ($MIC_{50/90}$ values, 0.015/0.03 mg/L; 100% inhibited at ≤ 4 mg/L, which is the EUCAST PK-PD non-species-related breakpoint), CoNS ($MIC_{50/90}$ values, 1/4 mg/L; 100% inhibited at ≤4 mg/L), and *E. faecalis* ($MIC_{50/90}$ values, 0.5/2 mg/L; 100.0% inhibited at ≤ 4 mg/L).

Conclusion. Ceftobiprole was highly active against clinical BJI isolates from the major Gram-positive pathogen groups collected at US medical centers during 2016–2019. The broad-spectrum activity of ceftobiprole, including potent activity against MRSA, supports its further evaluation for this potential indication.

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1596. Ceftolozane/tazobactam (Zerbaxa) for the Treatment of Pseudomonas aeruginosa (PSA) Bacteremia: A Systematic Literature Review (SLR)

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background. Bacteremia is a significant cause of morbidity and mortality. Several studies have shown this burden to increase among patients with multidrug resistant (MDR) PSA, and in those treated with inappropriate empiric therapy. Ceftolozane/tazobactam (C/T) is a combination of a novel antipseudomonal cephalosporin and an established β-lactamase inhibitor approved for the treatment of complicated urinary tract infection, complicated intra-abdominal infection and hospital-acquired and ventilator-associated bacterial pneumonia. In the absence of specific bacteremia clinical trial data; the aim of this study is to describe all published evidence relating to C/T for the treatment of Gram negative bacteremia.

Methods. This SLR includes all published evidence from December 2015 to March 2020 searched via the OVID platform: EMBASE, MEDLINE, and MEDLINE In-Process. In addition, data published (2018-2019) from the European Society of Clinical Microbiology and Infectious Diseases and Infectious Disease Week Congresses were included. Eligible publications were on adult patients treated with C/T reporting any clinical outcome where data were reported specifically for the bacteremia population.

Results. The SLR identified 1,455 citations, of which 24 publications representing 23 unique studies met eligibility criteria. This included primary and secondary bacteremia. Ten studies included patients with primary bacteremia, only 7 of which reported results specific to primary bacteremia patients. Despite heterogeneity in study design, patient and treatment characteristics, and a lack of detailed reporting; the majority of studies focused on MDR/ extensively drug resistant (XDR) infections (range: 68.3%-100%). Clinical success/ cure ranged from 33%-100%, with 6/7 studies at >85%; 30-day mortality from 0%-67%, with 3/7 studies at 0% (Table 1).

Table 1. Clinical Outcomes reported among Primary Bacteremia population(s)

	Baseline pathogen*	Treatment*	Outcome Cure/ Success definition*	Bacteremia N	Clinical cure/ success**	30-day mortality
Basetti 2019 (N=101)	PSA 100% MDR/XDR 68.3%	C/T (mono or combo)	Complete resolution of signs and symptoms and lack of microbiological evidence of infection.	**6**	6 (100%)	0 (0%)
Diaz-Canestro 2018 (N=58)	PSA 100% MDR/XDR 96.5%	C/T (mono or combo)	Failure was persistent signs and symptoms and positive culture after 7 days of treatment.	**3**	1 (33.3%)	2 (66.6%)
Elabor 2018 (N=65)	PSA 100% MDR 100% Immunocompromised	C/T monotherapy	Resolution of signs and symptoms present on diagnosis.	**4**	4 (100%)	0 (0%)
Gallagher 2018 (N=205)	PSA 100% MDR 100%	C/T (mono or combo)	Improved signs and symptoms from baseline to the end of therapy with defervescence.	**6**	6 (100%)	0 (0%)^
Haidar 2017 (N=21)	PSA 100% MDR 100% Immunocompromised	C/T combination	Defined as attributable mortality PSA, persistent signs or symptoms of infection or positive culture despite ≥7 days of C/T, or recurrent PSA (recurrent signs and symptoms and recurrent culture positivity within 90 days).	**1**	1 (100%)¶	-
Madeline 2018 (N=25)	PSA 100% MDR 100%	C/T (mono or combo)	Assessed by improved symptoms, improved imaging where relevant, and defervescence.	**7**	6 (86.0%)	1 (14.2%)
Jones 2020 (N=7)	PSA (100%) *Escherichia coli*¶¶	C/T monotherapy	Symptom resolution at the end of therapy, which was defined as documented subjective patient report of no complaints, distress, or disease-specific signs and/ or symptoms at follow-up outpatient physician clinic visits.	**1**	1 (100%)	-

Abb. C/T, ceftolozane/tazobactam; MDR, multi-drug resistance; PSA, *pseudomonas aeruginosa*; XDR, extensively drug resistant. *Baseline pathogen/ treatment details/ outcome definitions relate to the overall study population; ^ Authors reported mortality without time point; ** Study definitions vary, i.e. resolution of signs and symptoms. ¶ Authors reported patient death following clinical success; this was not infection related; ¶¶ Bacteremia patient reported *E. coli* and PSA.

Conclusion. Although the number of C/T treated patients was small, favorable clinical outcomes were observed, even among highly resistant PSA infections. Heterogeneity was ubiquitous, with diverse and complex patient profiles identified. Further studies where outcomes are stratified by bacteremia status and by timing of C/T treatment are needed.

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1597. Ceftolozane-Tazobactam and Meropenem Synergy Testing Against Multi-Drug and Extensively-Drug Resistant *Pseudomonas aeruginosa*

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Session: P-71. Treatment of Antimicrobial Resistant Infections

Background: Multidrug-resistant (MDR) and extensively drug-resistant (XDR) *Pseudomonas aeruginosa* (PA) have limited therapeutic options for treatment. Ceftolozane/tazobactam is a newer anti-pseudomonal drug effective against resistant PA infections, however resistance against this drug has now also developed and is increasing. In this study, we explored the combination of ceftolozane/tazobactam (CT) and meropenem (MP) as a possible effective regimen against MDR and XDR PA.