Poster 2761

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Activity of Cefiderocol and Comparator Agents Against *Achromobacter* and *Burkholderia* Isolates, Collected During 2020–2022 as Part of the SENTRY Antimicrobial Surveillance Program

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Background

- *Achromobacter* and *Burkholderia* species are frequent opportunistic pathogens in individuals with immunodeficiency, most notably cystic fibrosis.
- Cefiderocol is a siderophore-conjugated cephalosporin with broad activity against Gram-negative bacteria.

Objective

- To determine the activity of cefiderocol and comparator agents against isolates of *Achromobacter* and *Burkholderia cepacia* complex, collected in 2020–2022 in Europe and the USA as part of the SENTRY Antimicrobial Surveillance Program.

Methods

- Minimum inhibitory concentrations (MICs) were determined according to CLSI guidelines against 167 *Achromobacter* and 163 *B. cepacia* complex isolates, using broth microdilution with cation-adjusted Mueller–Hinton broth (CAMHB) for comparator agents and iron-depleted CAMHB for cefiderocol. Most isolates were from hospitalized patients with pneumonia (**Figure 1**).
- Susceptibility was assessed for agents with CLSI breakpoints. For agents without established CLSI breakpoints, only MIC_{50}, MIC_{90}, and MIC ranges are reported.

Results

- Cefiderocol was the most potent agent tested against *Achromobacter*, showing MIC_{50} and MIC_{90} values of 0.03 and 0.25 µg/mL, respectively and all isolates were inhibited at ≤4 µg/mL (**Table 1**, **Figure 2**).
- *Achromobacter* isolates from cystic fibrosis patients showed higher MIC_{50} and MIC_{90} values for most agents, but for cefiderocol MIC_{50} and MIC_{90} values remained low (**Table 1** versus **Table 2**, **Figure 2**).
- Against *B. cepacia* complex, cefiderocol was the most potent agent tested, with MIC_{50} and MIC_{90} values of 0.06 and 0.5 µg/mL, respectively (**Table 3**, **Figure 2**).

Figure 1. Source of *Achromobacter* spp. and *Burkholderia cepacia* complex isolates

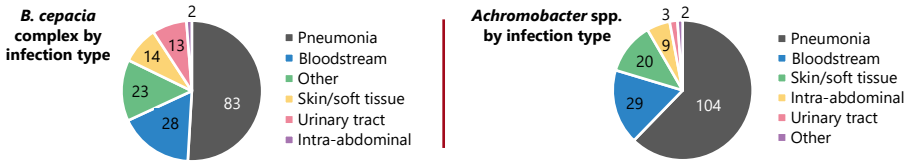


Table 1. Activity of cefiderocol and comparator agents against *Achromobacter* spp.[a] (N=167)

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[b]	%I[b]	%R[b]
Cefiderocol	**0.03**	**0.25**	**≤0.004 to 4**	NA	NA	NA
Imipenem-relebactam	1	2	0.5 to >8	NA	NA	NA
Meropenem-vaborbactam	0.12	4	0.03 to >8	NA	NA	NA
Ceftazidime-avibactam	4	16	1 to >32	NA	NA	NA
Ceftolozane-tazobactam	>16	>16	2 to >16	NA	NA	NA
Ceftazidime	4	16	1 to >32	81.4	13.8	4.8
Piperacillin-tazobactam	0.5	16	0.25 to >128	92.2	5.4	2.4
Meropenem	0.12	4	0.03 to >32	90.4	3.0	6.6
Levofloxacin	4	16	0.03 to >32	44.9	31.1	24.0
Amikacin	>32	>32	4 to >32	6.6	6.0	87.4
Trimethoprim-sulfamethoxazole	≤0.12	1	≤0.12 to >4	92.8		7.2
Minocycline	1	4	0.12 to 16	98.2	0.6	1.2

I, intermediate; NA, not applicable; MIC, minimum inhibitory concentration; R, resistant; S, susceptible. [a]*Achromobacter denitrificans* (1), *A. insolitus* (3), *A. marplatensis* (1), *A. xylosoxidans* (30), and unspeciated *Achromobacter* (132); [b]Criteria as published by CLSI (2023).

Table 2. Activity of cefiderocol and comparator agents against *Achromobacter* spp.[a] from cystic fibrosis patients (N=15)

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[b]	%I[b]	%R[b]
Cefiderocol	**0.06**	**0.25**	**≤0.004 to 0.5**	NA	NA	NA
Imipenem-relebactam	1	4	1 to >8	NA	NA	NA
Meropenem-vaborbactam	2	4	0.12 to >8	NA	NA	NA
Ceftazidime-avibactam	8	>32	2 to >32	NA	NA	NA
Ceftolozane-tazobactam	>16	>16	16 to >16	NA	NA	NA
Ceftazidime	8	>32	2 to >32	60.0	20.0	20.0
Piperacillin-tazobactam	2	>128	0.5 to >128	86.7	0.0	13.3
Meropenem	2	32	0.12 to >32	86.7	0.0	13.3
Levofloxacin	4	32	1 to 32	26.7	33.3	40.0
Amikacin	>32	>32	>32 to >32	0.0	0.0	100.0
Trimethoprim-sulfamethoxazole	0.25	1	≤0.12 to 4	93.3		6.7
Minocycline	1	4	0.25 to 16	93.3	0.0	6.7

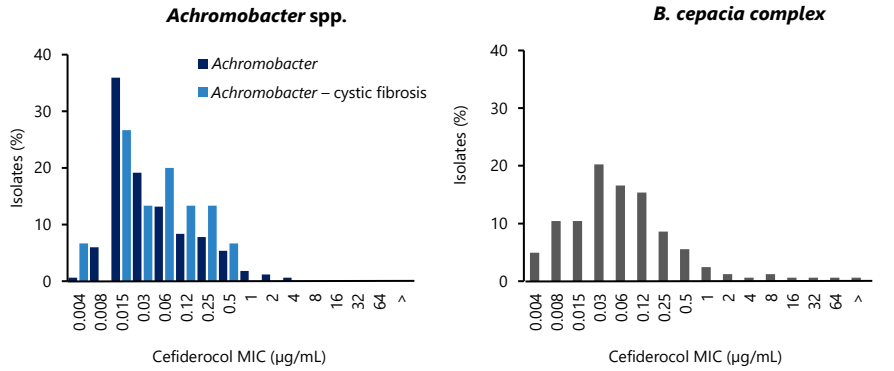
I, intermediate; MIC, minimum inhibitory concentration; NA, not applicable; R, resistant; S, susceptible. [a]*Achromobacter xylosoxidans* (2) and unspeciated *Achromobacter* (13); [b]Criteria as published by CLSI (2023).

Table 3. Activity of cefiderocol and comparator agents against *Burkholderia cepacia* complex (N=163)

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[a]	%I[a]	%R[a]
Cefiderocol	**0.06**	**0.5**	**≤0.004 to >64**	NA	NA	NA
Imipenem-relebactam	0.5	2	0.06 to >8	NA	NA	NA
Meropenem-vaborbactam	1	2	0.25 to >8	NA	NA	NA
Ceftazidime-avibactam	2	8	1 to >32	NA	NA	NA
Ceftolozane-tazobactam	2	>16	0.5 to >16	NA	NA	NA
Ceftazidime	4	32	1 to >32	82.2	6.7	11.0
Meropenem	4	8	0.25 to >32	80.4	12.3	7.4
Levofloxacin	2	16	0.5 to >32	55.2	17.8	27.0
Trimethoprim-sulfamethoxazole	0.5	4	≤0.12 to >4	88.3		11.7
Minocycline	2	8	0.25 to >32	82.8	8.0	9.2

I, intermediate; MIC, minimum inhibitory concentration; NA, not applicable; R, resistant; S, susceptible. [a]Criteria as published by CLSI (2023).

Figure 2. Cefiderocol MIC distributions against *Achromobacter* spp. (N=167) *and B. cepacia* complex (N=163)



Conclusion

Cefiderocol showed potent *in vitro* activity against a set of contemporary clinical *Achromobacter* and *B. cepacia* complex isolates, suggesting that cefiderocol could be an important treatment option for infections caused by these opportunistic pathogens.