Poster 2790

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Activity of Cefiderocol and Comparator Agents Against Pediatric Isolates of Enterobacterales, *Pseudomonas aeruginosa*, *Acinetobacter baumannii-calcoaceticus* Species Complex, and *Stenotrophomonas maltophilia* from the SENTRY Surveillance Program (2020–2022)

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Objective

- To evaluate the *in vitro* activity of cefiderocol and comparator agents against isolates from pediatric patients (0–17 years old) collected in 2020–2022 as part of the SENTRY Antimicrobial Surveillance Program.

Methods

- Minimum inhibitory concentrations (MICs) were determined for 2,249 Enterobacterales, 707 *Pseudomonas aeruginosa*, 194 *Acinetobacter baumannii-calcoaceticus* complex, and 220 *Stenotrophomonas maltophilia* isolates from the USA and Europe using broth microdilution with cation-adjusted Mueller–Hinton broth (CAMHB) for comparators and iron-depleted CAMHB for cefiderocol.
- Multidrug-resistant (MDR) phenotype was defined as resistant to more than one antimicrobial agent in ≥3 antimicrobial categories.
- Carbapenem non-susceptible (CarbNS) was defined as non-susceptible to imipenem and meropenem. Susceptibility was interpreted according to 2023 CLSI, FDA, and EUCAST breakpoints.

Results

Table 1. Distribution by infection type

Infection type	Enteric	Non-enteric	Total
Pneumonia in hospitalized patients	608	781	1389
Urinary tract infection	948	91	1039
Bloodstream infection	498	152	650
Intra-abdominal infection	134	49	183
Skin and skin structure infection	44	137	181

Figure 1. Activity of cefiderocol and comparator antimicrobial agents tested against resistant phenotypic subsets of Enterobacterales from pediatric patients in SENTRY 2020–2022 (CLSI interpretation)

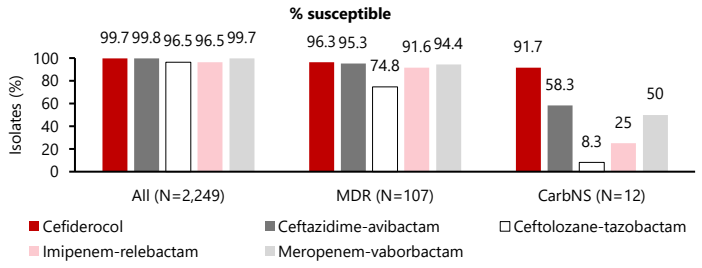

Table 2. Activity of cefiderocol and comparator antimicrobial agents tested against Enterobacterales collected from pediatric patients in SENTRY 2020–2022

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[a] CLSI/FDA	%S[a] EUCAST
Enterobacterales (N=2,249)					
Cefiderocol	0.06	0.5	≤0.004 to 32	99.7	99.2
Meropenem	0.03	0.06	≤0.015 to >32	99.3	99.4
Imipenem-relebactam	0.12	0.5	≤0.03 to >8	96.5	99.0
Meropenem-vaborbactam	0.03	0.06	≤0.015 to >8	99.7	99.7
Ceftazidime-avibactam	0.12	0.25	≤0.015 to >32	99.8	99.8
Ceftolozane-tazobactam	0.25	1	≤0.12 to >16	96.5	96.5
CarbNS – Enterobacterales (N=12)					
Cefiderocol	2	4	0.03 to 8	91.7	58.3
Imipenem-relebactam	4	>8	0.06 to >8	25.0	33.3
Meropenem-vaborbactam	4	>8	0.06 to >8	50.0	50.0
Ceftazidime-avibactam	2	>32	0.25 to >32	58.3	58.3
Ceftolozane-tazobactam	>16	>16	0.5 to >16	8.3	8.3

[a]According to 2023 CLSI, FDA, and EUCAST breakpoints. MIC, minimum inhibitory concentration; S, susceptible; N, number of isolates; CarbNS, carbapenem non-susceptible.

Table 3. Activity of cefiderocol and comparator antimicrobial agents tested against *P. aeruginosa* collected from pediatric patients in SENTRY 2020–2022

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[a] CLSI	%S[a] FDA	%S[a] EUCAST
***P. aeruginosa* (N=707)**						
Cefiderocol	0.06	0.25	≤0.004 to 16	99.9	98.7	99.7
Meropenem	0.5	4	≤0.015 to >32	88.1	88.1	88.1
Imipenem-relebactam	0.25	0.5	≤0.03 to >8	97.5	97.5	97.5
Meropenem-vaborbactam	0.5	4	≤0.015 to >8	NA	NA	95.6
Ceftazidime-avibactam	2	4	0.12 to >32	98.6	98.6	98.6
Ceftolozane-tazobactam	0.5	1	≤0.12 to >16	98.0	98.0	98.0
CarbNS – *P. aeruginosa* (N=68)						
Cefiderocol	0.12	0.25	≤0.004 to 4	100	98.5	98.5
Imipenem-relebactam	1	>8	0.12 to >8	73.5	73.5	73.5
Meropenem-vaborbactam	8	>8	2 to >8	NA	NA	54.4
Ceftazidime-avibactam	4	16	0.5 to >32	85.3	85.3	85.3
Ceftolozane-tazobactam	1	8	0.25 to >16	85.3	85.3	85.3

[a]According to 2023 CLSI, FDA, and EUCAST breakpoints. MIC, minimum inhibitory concentration; S, susceptible; N, number of isolates; CarbNS, carbapenem non-susceptible; NA, not applicable.

Figure 2. Activity of cefiderocol and comparator antimicrobial agents tested against resistant phenotypic subsets of *P. aeruginosa* from pediatric patients in SENTRY 2020–2022 (CLSI interpretation)

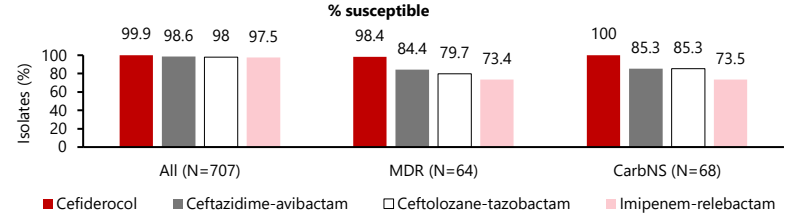

Table 4. Activity of cefiderocol and comparator antimicrobial agents tested against *A. baumannii-calcoaceticus* complex and *S. maltophilia* isolates collected from pediatric patients in SENTRY 2020–2022

Agent	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)	MIC range (µg/mL)	%S[a] CLSI	%S[a] FDA	%S[a] EUCAST
***A. baumannii-calcoaceticus* complex (N=194)**						
Cefiderocol	0.06	1	0.008 to >64	97.9	95.4	97.4
Meropenem	0.5	32	0.06 to >32	87.1	87.1	87.1
Imipenem-relebactam	0.12	>8	≤0.03 to >8	NA	NA	88.1
Ampicillin-sulbactam	2	32	≤0.5 to >64	80.9	80.9	NA
Colistin	0.5	1	0.12 to >8	NA	NA	95.4
CarbNS – *A. baumannii-calcoaceticus* complex (N=23)						
Cefiderocol	0.25	1	0.03 to 8	95.7	91.3	95.7
Imipenem-relebactam	>8	>8	>8 to >8	NA	NA	0
Ampicillin-sulbactam	32	>64	4 to >64	17.4	17.4	NA
Colistin	0.5	>8	0.25 to >8	NA	NA	78.3
***S. maltophilia* (N=220)**						
Cefiderocol	0.06	0.25	0.008 to 1	100	NA	100
Levofloxacin	1	4	0.12 to >32	88.1	NA	NA
Trimethoprim-sulfamethoxazole	≤0.12	0.5	≤0.12 to >4	96.4	NA	97.7

[a]According to 2023 CLSI, FDA, and EUCAST breakpoints. MIC, minimum inhibitory concentration; S, susceptible; N, number of isolates; CarbNS, carbapenem non-susceptible; NA, not applicable.

Conclusions

Cefiderocol was a highly active β-lactam against contemporary pediatric isolates of Enterobacterales, *P. aeruginosa*, *Acinetobacter baumannii-calcoaceticus* complex, and *S. maltophilia*, including CarbNS subsets for which treatment options are limited.

Cefiderocol was the most active agent against both MDR and CarbNS Enterobacterales, and against CarbNS *P. aeruginosa*.

These data suggest that cefiderocol may be a valuable treatment for serious Gram-negative infections in pediatric patients.