Poster 1532

SURVEILLANCE OF ERAVACYCLINE AGAINST CLINICAL PATHOGENS, INCLUDING RESISTANT ISOLATES, COLLECTED WORDWIDE FROM MULTIPLE INFECTION SITES DURING 2018-2022

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Introduction

Eravacycline is a fully-synthetic, fluorocycline antibiotic approved for the treatment of complicated intra-abdominal infections (cIAI) in patients ≥18 years of age in the United States, European Union, Iceland, Norway, Singapore, Great Britain, Hong Kong, China, and Taiwan. The purpose of this five-year surveillance study was to further monitor the activity and susceptibility of eravacycline against clinically relevant Gram-positive (*Staphylococcus aureus*, *Enterococcus* spp., and *Streptococcus anginosus* group) and Gram-negative pathogens (*Enterobacterales*, *Acinetobacter baumannii,* and *Stenotrophomonas maltophilia*).

Methods & Materials

A total of 23,127 clinical isolates were collected worldwide during 2018-2022 from multiple infection sources. Of these, 4,812, 9,606 and 8,709 were from Asia/Pacific, Europe, and North America, respectively. Country and infection source demographics are shown in Figures 1-4. MICs were determined by CLSI broth microdilution. FDA and EUCAST breakpoints were used for eravacycline, FDA breakpoints for tigecycline and CLSI breakpoints for other comparators.

Results Summary

Table 1 shows the unchanged, in vitro activity of eravacycline during 2018-2022, susceptibility data for eravacycline and comparator antibiotics are shown in Tables 2 & 3, while Table 4 provides a summary of eravacycline activity and susceptibility rates. Notably, eravacycline demonstrated high effectiveness against Gram-positive pathogens, with susceptibility rates exceeding 90% when using EUCAST breakpoints. For Gram-negative pathogens, eravacycline maintained consistent susceptibility rates above 93%, although the rate was lower at 84.2% for multi-drug resistant (MDR) strains. While there are no clinical breakpoints for non-fermenting bacteria, eravacycline showed in vitro activity against many of these pathogens, with MIC_{50} and MIC_{90} values ranging from 0.5 to 2 µg/ml.

Conclusion

Since its approval in 2018, eravacycline has sustained high and consistent rates of susceptibility against all clinically relevant pathogens regardless of geographical region or source of infection. Activity of eravacycline was constant from 2018-2022. These data support the continued use of eravacycline caused by both Gram-negative and Gram-positive isolates in the treatment of complicated intra-abdominal infections.

Figure 1. Gram-negative Isolates by Region

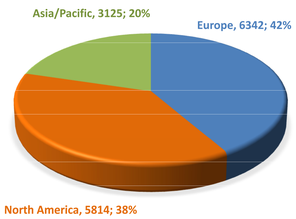

Figure 2. Gram-negative Isolates by Infection

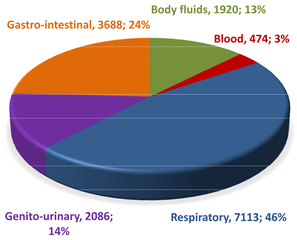

Figure 3. Gram-Positive Isolates by Region

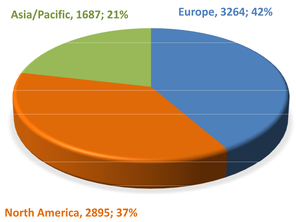

Figure 4. Gram-Positive Isolates by Infection

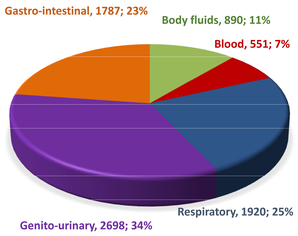

Table 1. Eravacycline: *In Vitro* Activity Summary by Years

Organism	2018			2019			2020			2021			2022		
	N	MIC_{50}	MIC_{90}	N	MIC_{50}	MIC_{90}	N	MIC_{50}	MIC_{90}	N	MIC_{50}	MIC_{90}	N	MIC_{50}	MIC_{90}
Enterobacterales	2526	0.25	0.5	2486	0.25	0.5	2358	0.25	0.5	2439	0.25	0.5	2632	0.25	0.5
A. baumannii	496	0.5	1	469	0.5	1	431	0.5	2	466	0.5	1	488	0.5	1
S. maltophilia	101	0.5	2	103	0.5	2	101	1	2	95	1	2	90	0.5	1
S. aureus	520	0.06	0.12	499	0.06	0.06	575	0.03	0.06	604	0.03	0.06	835	0.03	0.06
Enterococcus spp.	985	0.06	0.12	967	0.03	0.06	870	0.03	0.06	1027	0.03	0.06	807	0.03	0.06
S. anginosus group	44	0.015	0.03	35	0.015	0.03	35	0.015	0.03	41	0.03	0.03	2	0.015	0.03

Table 2. Global *In Vitro* Susceptibility of Gram-positive Isolates

Drug	% Susceptible					
	S. aureus (n=3033)	MRSA (n=1351)	MSSA (n=1682)	*Enterococcus* spp. (n=4656)	VRE (n=711*)/(731**)	*S. anginosus* group (n=157)
Eravacycline FDA*	**90.2**	**84.2**	**95.0**	**94.1**	**90.9**	**100.0**
Eravacycline EUCAST**	**98.9**	**97.5**	**99.9**	**98.9**	**97.3**	**100.0**
Ampicillin	NT	NT	NT	60.1	6.6	NT
Azithromycin	53.9	29.4	73.6	NT	NT	77.1
Ceftaroline	95.3	90.2	99.8	NT	NT	NT
Ceftriaxone	NT	NT	NT	NT	NT	99.4
Chloramphenicol	NT	NT	NT	NT	NT	96.2
Clindamycin	86.8	74.8	96.4	NT	NT	85.4
Daptomycin	99.8	99.6	99.9	90.1	85.1	100.0
Levofloxacin	63.7	28.7	91.7	47.4	0.4	98.1
Linezolid	100.0	100.0	100.0	98.4	97.9	100.0
Meropenem	NT	NT	NT	NT	NT	99.4
Minocycline	96.1	92.3	99.2	44.9	49.5	NT
Oxacillin	55.5	0.0	100.0	NT	NT	NT
Penicillin	16.9	0.2	30.4	58.6	7.0	96.2
Tetracycline	89.5	82.3	95.2	32.7	27.3	69.4
Tigecycline FDA	99.3	98.7	99.8	95.0	93.8	100.0
Trimethoprim Sulfa	98.4	96.9	99.6	NT	NT	NT
Vancomycin	100.0	99.9	100.0	84.3	0.0	100.0

NT, not tested; * breakpoint FDA; **breakpoint EUCAST; MRSA, methicillin-resistant *S. aureus*; MSSA, methicillin-susceptible *S. aureus*; VRE, vancomycin-resistant Enterococci; MDR, multi-drug resistant based on resistance to at least three antibiotic classes

Table 3. Global *In Vitro* Susceptibility of Gram-negative Isolates

Drug	% Susceptible			
	Enterobacterales (n= 12441)	MDR *Enterobacterales* (n=3364)*/(n=3462)**	ESBL-positive (n=1364)	ESBL-negative (n=6662)
Eravacycline FDA*	**93.6**	**84.2**	**89.9**	**95.8**
Eravacycline EUCAST**	**93.6**	**81.1**	**89.9**	**95.8**
Aztreonam	75.9	19.4	13.0	94.8
Cefepime	85.1	47.9	19.7	96.9
Cefotaxime	74.1	17.2	7.3	95.7
Ceftazidime	77.1	24.5	24.5	96.0
Ceftazidime-avibactam	98.6	94.7	98.6	98.9
Ceftriaxone	73.2	15.0	5.4	94.3
Ertapenem	92.7	74.1	87.0	96.5
Gentamicin	90.2	66.2	59.6	95.4
Levofloxacin	82.6	47.4	35.9	89.3
Meropenem	96.7	87.8	92.6	97.2
Minocycline	86.0	68.1	73.2	89.0
Piperacillin Tazobactam	77.1	30.1	50.0	89.1
Tetracycline	79.3	48.6	42.5	83.6
Tigecycline	97.0	93.2	95.9	97.6
Trimethoprim Sulfa	80.5	45.2	37.0	86.6

* breakpoint FDA; **E. coli EUCAST breakpoint adopted for *Enterobacterales (Citrobacter freundii, Enterobacter cloacae, Escherichia coli, Klebsiella oxytoca* and *Klebsiella pneumoniae*); ESBL, extended spectrum beta-lactamase producer; MDR, multi-drug resistant based on resistance to at least three antibiotic classes

Table 4. Eravacycline: *In Vitro* Activity and Susceptibility Summary

Organism	N	Breakpoint	% Susceptible	MIC_{50}	MIC_{90}	Min MIC	Max MIC
Enterobacterales	12441	FDA	93.6	0.25	0.5	≤ 0.015	> 16
	12441	EUCAST	93.6	0.25	0.5	≤ 0.015	> 16
MDR *Enterobacterales*	3364	FDA	84.2	0.25	1	0.03	> 16
	3462	EUCAST	81.1	0.25	1	0.03	> 16
S. aureus	3033	FDA	90.2	0.03	0.06	≤ 0.008	2
	3033	EUCAST	98.9	0.03	0.06	≤ 0.008	2
MRSA	1351	FDA	84.2	0.06	0.12	≤ 0.008	2
	1351	EUCAST	97.5	0.06	0.12	≤ 0.008	2
MDR MRSA	848	FDA	75.0	0.06	0.25	≤ 0.008	2
	860	EUCAST	96.1	0.06	0.25	≤ 0.008	2
MSSA	1682	FDA	95.0	0.03	0.06	≤ 0.008	1
	1682	EUCAST	99.9	0.03	0.06	≤ 0.008	1
Enterococcus spp.	4656	FDA	94.1	0.03	0.06	≤ 0.001	2
	4656	EUCAST	98.9	0.03	0.06	≤ 0.001	2
VRE	711	FDA	90.9	0.03	0.06	0.008	2
	731	EUCAST	97.3	0.03	0.06	0.004	2
S. anginosus group	157	FDA	100.0	0.015	0.03	≤ 0.001	0.06
	157	EUCAST	100.0	0.015	0.03	≤ 0.001	0.06

References

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EUCAST, 2024. Breakpoint Tables, V 14.0, 01/01/2024

Acknowledgments

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