Ceftazidime-Avibactam vs Meropenem-Vaborbactam

Use: Enterobacterales family of Gram-negative bacteria

- *Escherichia coli*
- *Klebsiella pneumoniae*
- *Enterobacter* species

Mechanism of resistance: production of broad-spectrum beta lactamase that hydrolyze and inactivate beta-lactam antibiotics, including carbapenems → carbapenem-resistant Enterobacteriaceae (CRE)

	Ceftazidime-Avibactam (Avycaz)	Meropenem-Vaborbactam (Vabomere)
Mechanism of action	Ceftazidime: β-lactam, 3rd generation cephalosporin Avibactam: β-lactamase inhibitor, extends ceftazidime spectrum of activity	Meropenem: β-lactam, carbapenem Vaborbactam: β-lactamase inhibitor, protects meropenem degradation by extended spectrum β-lactamases
FDA approved indication	• Complicated intra-abdominal infections (IAI) with metronidazole • Complicated urinary tract infections (UTI) • Hospital-acquired pneumonia/ ventilator-associated pneumonia	• Complicated UTI
Spectrum of activity	• CRE	• CRE
Common dosing	• 2.5 g (ceftazidime 2g-avibactam 0.5g) IV every 8 hours • Renal dose adjustment for CrCl < 50 ml/min	• 4 g (meropenem 2g-vaborbactam 2g) IV every 8 hours • Renal dose adjustment for CrCl < 50 ml/min
AWP cost per dose	$430.57	$396.00

Trial data	**Mazuski et al:**
	• Patient population: IAI
	• Intervention:
	   ○ Ceftazidime-avibactam 2-0.5g + metronidazole 500 mg every 8 hours
	   ○ Meropenem 1g every 8 hours
	   ○ Placebo every 8 hours
	• Outcome: clinical cure at 28-35 days with ceftazidime-avibactam + metronidazole (81.6%) was noninferior versus meropenem (85.1%)
	Carmeli et al:
	• Patient population: complicated UTI or complicated IAI due to ceftazidime-resistant Enterobacteriaceae or *P. aeruginosa*
	• Intervention: ceftazidime-avibactam 2-0.5g every 8 hours versus best available therapy (carbapenem used in 97% of best available therapy group)
	• Outcome: clinical cure at test of cure visit was similar in ceftazidime-avibactam (91%) versus best available (91%)
		TANGO-I:
		• Patient population: complicated UTI
		• Intervention:
		   ○ Meropenem-vaborbactam 2g-2g IV every 8 hours
		   ○ Piperacillin-tazobactam 4g-0.5g every 8 hours
		• Outcome: clinical cure and microbial eradication with meropenem-vaborbactam (98.4%) was noninferior to piperacillin-tazobactam (94%)
		TANGO-II:
		• Patient population: suspected or confirmed CRE infections
		• Intervention: meropenem-vaborbactam 2g-2g every 8 hours versus best available therapy (combination therapy with carbapenem)
		• Outcome: clinical cure rate at end of therapy higher in meropenem-vaborbactam (64.3%) versus best available therapy (33.3%)

References

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