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ePoster Viewing

Mechanisms of action, preclinical data & pharmacology of antibacterial agents

In vitro activity of Ceftazidime, Ceftaroline and Aztreonam alone and in combination with Avibactam against nosocomial bloodstream Enterobacteriaceae isolates in Russia

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Background: The aim of the study was to evaluate the *in vitro* activity of combinations of the new beta-lactamase inhibitor avibactam with aztreonam, ceftaroline and ceftazidime against nosocomial bloodstream *Enterobacteriaceae* isolates in different regions of Russia.

Material/methods: In total 271 strains of *Enterobacteriaceae* family members (118 - *Klebsiella* spp., 87 - *Enterobacter* spp., 46 - *Escherichia* spp., 18- *Citrobacter* spp., 1 - *Morganella* spp., 1 - *Proteus* spp.) isolated during 2014 from patients with nosocomial bloodstream infections in 28 medical institutions from different regions of Russia were tested. MICs of aztreonam, ceftaroline and ceftazidime with and without avibactam, as well as MICs of other antimicrobials (ertapenem, piperacillin/tazobactam, tigecycline, ciprofloxacin, amikacin) were determined using broth microdilution method according to ISO and EUCAST methodology. Results of susceptibility testing were interpreted according to recent (v.5.0) EUCAST guidelines; for avibactam combinations ceftazidime, ceftaroline and aztreonam EUCAST breakpoints were used.

Results: The results of avibactam combinations susceptibility testing are summarized in the Table. The rates of non-susceptibility to other antimicrobials were: carbapenems - 13.3%, piperacillin/tazobactam - 53.1%, tigecycline - 29.9%, ciprofloxacin - 59.4%, 10.0% - amikacin.

Table. Avibactam combinations susceptibility testing results.

Antimicrobial	Susceptible, n (%)	Intermediate, n (%)	Resistant, n (%)	MIC50, mg/l	MIC90, mg/l	MIC range, mg/l
Aztreonam	79 (29.2)	6 (2.2)	186 (68.6)	64	256	0.06-128
Aztreonam-avibactam	266 (98.2)	1 (0.4)	4 (1.5)	0.125	0.25	0.06-128
Ceftaroline	76 (28.0)	-	195 (72.0)	256	256	0.03-128
Ceftaroline-avibactam	252 (93.0)	-	19 (7.0)	0.125	0.5	0.03-128

Ceftazidime	85 (31.4)	10 (3.7)	176 (64.9)	32	256	0.06-128
Ceftazidime-avibactam	243 (89.7)	16 (5.9)	12 (4.4)	0.5	2	0.06-128

Conclusions: Avibactam markedly increases the activity of aztreonam, ceftazidime and ceftazidime-avibactam against nosocomial bloodstream *Enterobacteriaceae* isolates.