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Paper Poster Session IV

Healthcare-associated infection epidemiology and control

In vitro activity of ceftobiprole against clinical isolates collected from blood and respiratory specimen of hospitalized patients: results of the PEG study

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Objectives: Empirical treatment of hospital-acquired pneumonia (HAP) has increasingly been threatened by the emergence and dissemination of multidrug resistant [MDR] pathogens, while empirical treatment of community-acquired pneumonia (CAP) should take the prevalence of antimicrobial resistance in pneumococci into account. Ceftobiprole (BPR), recently approved for the treatment of HAP and CAP in Europe, has been shown to have a broad-spectrum of in vitro activity against Gram-positive and Gram-negative pathogens, including methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa*. The objective of this study was to evaluate the susceptibilities (S) of blood and respiratory isolates of *S. aureus* (SAU), *Streptococcus pneumoniae* (SPN), *Escherichia coli* (ECO), *Klebsiella pneumoniae* (KPN), *K. oxytoca* (KOX), *Enterobacter* spp. (ENT), *Serratia* spp. (SER), *Citrobacter* spp. (CIT), *Proteeae* (PRO), and *P. aeruginosa* (PAE) to BPR and comparators.

Methods: A total of 1,246 clinical isolates were prospectively collected from 25 laboratories across Germany (n=21), Switzerland (n=3 and Austria (n=1), which participated in the surveillance study conducted by the Paul Ehrlich Society in 2010. MICs of BPR and comparators were determined using the microdilution method according to the standard ISO 20776-1 and interpreted by EUCAST species-related clinical breakpoints, if applicable. The CLSI MIC method was employed as screening test for ESBL-producing isolates.

Results: Of the 1,246 isolates, 65.2% were recovered from respiratory specimens and 34.8% from blood. There were 544 ICU isolates and 702 non-ICU isolates. The share of MRSA in SAU isolates was 16%. Of the SPN isolates, 18.5% showed reduced susceptibility to penicillin (PEN), but none was PEN-resistant. Of the ECO and KPN isolates, 18.4% and 16.7% showed an ESBL phenotype, respectively. MIC50/90 values for MSSA and MRSA were 0.5/0.5 mg/L and 2/2 mg/L, respectively. All SPN isolates were inhibited by 1 mg BPR per mL. MIC50/90 values for ECO and KPN were comparable to those of ceftriaxone (CRO), but BPR was more active than CRO against isolates of Enterobacteriaceae species known to produce chromosomally encoded AmpC-β-BL. MIC50/90 values of BPR for PAE (4/32) mg/L were comparable to those of ceftazidime (2/32 mg/L) and cefepime (4/32 mg/L). MIC distributions and susceptibility (S) rates of BPR are displayed in the Table.

Conclusion: Based on the results of this surveillance study, BPR was active against key pathogens associated with HAP and CAP in hospitalized patients. Hence, BPR may represent a suitable option for the empirical treatment of HAP and CAP, especially for cases in which MRSA and Gram-negative infections are suspected.

Table: MIC distributions of BPR and % of susceptible (S) isolates

Organism / phenotype (n)	Cumulative % of isolates inhibited at MIC (mg/L):									%S
	≤0.25	0.5	1	2	4	8	16	32	≥64	
SAU (188)	21.8	*83.0*	84.6	*98.4*	100					98.4
MS (158)	25.9	*98.7*	99.4	100						100
MR (30)			6.7	*90.0*	100					90.0
SPN (254)	*94.9*	98.8	100							98.8
PS (207)	*100*									100
PI (47)	*72.3*	*93.6*	100							93.6
ECO (179)	*79.9*	81.6	82.7				83.8	84.9	*100*	79.9
ESBL neg. (146)	*96.6*	98.6	100							96.6
ESBL pos. (33)	6.1						12.1	18.2	*100*	6.1
KPN (108)	*79.6*	82.4		84.3				85.2	*100*	79.6
ESBL neg. (90)	*95.6*	98.9		100						95.6
ESBL pos. (18)				5.6				11.1	*100*	0
KOX (44)	43.2	*68.2*	77.3						*100*	43.2
ENT (89)	*74.2*	77.5	78.7	82.0	89.9	*93.3*	94.4	95.5	100	74.2
SER (74)	*85.1*	*91.9*	95.9	97.3		98.6		100		85.1
CIT (26)	*84.6*	*92.3*							100	84.6
PRO (43)	*76.7*		79.1		81.4	83.7		88.4	*100*	76.7
PAE (241)		0.8	5.0	29.0	*57.7*	77.6	87.1	*90.0*	100	NE
CAZ-S (191)		1.0	5.8	36.1	*68.1*	88.5	*96.3*	97.9	100	NE
CAZ-R (50)			2.0		18.0	36.0	*52.0*	60.0	*100*	NE

NE, not evaluable as EUCAST has not defined a species-related breakpoint yet;
MIC50/90 values are given in italic.