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Paper Poster Session

New and old antibiotics against Gram-positive cocci in vitro

Activity of ceftaroline tested against *Staphylococcus* collected from a nationwide study in Spain in 2014

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Background: Ceftaroline (CPT), the active metabolite of the prodrug ceftaroline fosamil, is a novel cephalosporin with broad-spectrum in vitro bactericidal activity against Gram-positive organisms, including methicillin-resistant *Staphylococcus aureus* (MRSA). We evaluate the in vitro activity of CPT tested against 905 staphylococcal isolates collected in a nationwide prevalence study in Spain (2014) and compare the results with those obtained in a previous nationwide study performed in 2010.

Material/methods: On September 23rd 2014, we collected all staphylococci isolated in 144 Spanish hospitals. All microorganisms were sent to a central laboratory for identification and antimicrobial susceptibility testing. CPT susceptibility testing was performed by the gradient diffusion (GD) method (epsilon test, Liofilchem, Italy). CLSI and EUCAST breakpoints were applied for CPT (susceptible ≤ 1 mg/L). *S. aureus* ATCC 29213 and *E. faecalis* ATCC 29212 were used as control strains.

Results: In the 2014 study we collected 579 *S. aureus* and 326 coagulase-negative staphylococci (CoNS) isolates. Among those, 161 isolates were MRSA, and 171 were methicillin-resistant (MR) CoNS. CPT inhibited 97.6% of all isolates at an MIC of ≤ 1 mg/L and 86.7% at an MIC of ≤ 0.5 mg/L. The CPT MIC₅₀, MIC₉₀, and range for all isolates tested were 0.25, 0.75, and ≤ 0.023 -4 mg/L, respectively. Against *S. aureus*, CPT inhibited 99% of isolates at an MIC of ≤ 1 mg/L, and against MRSA, CPT inhibited 96.3% of isolates at an MIC of ≤ 1 mg/L. Against CoNS, CPT inhibited 95.1% of isolates at an MIC of ≤ 1 mg/L, and against MR-CoNS, CPT inhibited 90.6% of isolates at an MIC of ≤ 1 mg/L. Ten MR-CoNS isolates showed a CPT MIC of ≥ 2 mg/L and all were *Staphylococcus haemolyticus*. Comparative CPT MIC results (mg/L) of the 2010 and 2014 studies are shown in the table.

Conclusions: This study shows potent in vitro activity of CPT against recent staphylococci, including MRSA strains, recovered in a nationwide study (2014). In comparison with the study performed in 2010, we observed a slight increase in the CPT MIC values against staphylococci.

Ceftaroline	MIC50	MIC90	Range	Ceftaroline	MIC50	MIC90	Range
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(2014 study)				(2010 study)			
Isolates (No.)				Isolates (No.)			
All isolates (n=905)	0.25	0.75	0.023-4	All isolates	0.12	0.5	0.023-2
<i>S. aureus</i> (n=579)	0.25	0.75	0.032-2	<i>S. aureus</i> (n=542)	0.12	0.38	0.023-1
MSSA (n=418)	0.19	0.38	0.032-0.75	MSSA (n=372)	0.12	0.19	0.023-0.5
MRSA (n=161)	0.75	1	0.064-2	MRSA (n=170)	0.25	0.5	0.032-1
CoNS (n=326)	0.19	0.5	0.023-4	CoNS (n=438)	0.19	0.5	0.023-2
CoNS-MS (n=155)	0.12	0.25	0.023-0.38	CoNS-MS (n=166)	0.094	0.12	0.023-0.5
CoNS-MR (n=171)	0.38	1	0.094-4	CoNS-MR (n=272)	0.25	0.5	0.047-2