Antimicrobial Characterization of CEM-101: Potential Application Against Species Causing Enteritis/Gastroenteritis

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Background:

MLS_B-ketolides have been considered for expanded use against gastroenteritis disease pathogens (GDP) such as *H. pylori* (HP) gastritis, and diarrheal illness associated with *Camplylobacter jejuni* (CJ), *Salmonella* spp. (SAL) and *Shigella* spp. (SHI). CEM-101, a novel macrolide-ketolide, was screened against contemporary GDP isolates and reported here.

Methods:

SAL (20 strains, representing 11 serotypes) and SHI (40; four species) were tested by CLSI broth microdilution methods with M100-S18 breakpoints applied. CJ (20) and HP (23) were tested by Mueller-Hinton agar dilution method, supplemented with sheep blood, and CJ results were confirmed by Etest (AB BIODISK, Solna, Sweden). Key comparison agents were tested: azithromycin (AZ), clarithromycin (CLA), telithromycin (TEL), levofloxacin (LEV), amoxicillin/clavulanate (A/C) and trimethoprim/sulfamethoxazole (TMP/SMX).

Results:

CEM-101 demostrated activity against food-borne GDPs SAL (MIC_{50}, 4 µg/ml), SHI (MIC_{50}, 8 µg/ml) and CJ (MIC_{50}, 1 µg/ml). This was comparable or superior (MIC_{50} ranges) to: TEL (8-16 µg/ml), erythromycin (2- > 4 µg/ml), AZ (4 µg/ml) and A/C (2-8 µg/ml). CLA results were diverse (MIC_{50} range 0.015- > 16 µg/ml) as well as were TMP/SMX; LEV was most active (MIC_{50}, ≤ 0.12 µg/ml). HP CEM-101 MIC results were grouped from 0.03-0.25 µg/ml and at 2 or 4 µg/ml; the latter corresponding to CLA-R (>16 µg/ml) strains.

	CEM-101			Comparator (drug)[a]		
Organism (no.)	50%	90%	Range	50%	90%	Range
C. jejuni (20)	1	4	1-8	2	4	1-8 (CLA)
H. pylori (23)	0.06	0.25	0.03-4	0.03	0.12	≤0.015->16 (CLA)
Salmonella spp. (20)	4	>16	1->16	4	8	2-8 (AZ)
Shigella spp. (40)	8	16	1->16	4	8	1->16 (AZ)
a. Comparator drug in parentheses (azithromycin [AZ] or clarithromycin [CLA]).						

Conclusions:

CEM-101 exhibited activity against GDP strains like that of other macrolide-ketolides that have been applied for treatment (CLA, AZ), and this novel compound (CEM-101) should be studied alone or in combination at the clinical level, especially versus CLA-R gastric disease.