

Solithromycin (CEM-101) In vitro Susceptibility of *Bordetella pertussis*, an Emerging Respiratory Pathogen in the Adult

ICAAC 2013

Abstract E-1187a

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Background: Pertussis peaks every 3 to 5 years and more than 41,000 cases of pertussis were reported to CDC during 2012 and 18 pertussis-related deaths were noted by January, 2013. Although, the majority of deaths continue to occur among infants (< 3 months), and it is considered a disease of neonates and young children, increased rates of pertussis have been noted in adolescent children and adults. Other respiratory pathogens often cause clinical symptoms similar to pertussis and therefore many cases go unreported and outbreaks are difficult to manage. Since antibiotics are often administered in these respiratory infection outbreaks it is important that the antibiotic used provides adequate coverage for a broad range of potential pathogens. We have tested the in vitro activity of solithromycin (CEM-101), a new macrolide, the first fluoroketolide which is in Phase 3 clinical development for CABP, and comparator antibiotics.

Methods: 24 clinical strains of *B. pertussis* cultured from nasopharyngeal specimens collected in 2010-2013 were tested. MICs were determined by agar dilution methodology, as described by CLSI M7-A8, in Mueller-Hinton agar supplemented with 5% sheep blood. Organism suspensions harvested from fresh agar cultures were adjusted to yield a final test inoculum of 1×10^4 CFU/spot. Inoculated agar plates were incubated for 72 hours at 36° C in ambient air supplemented with 5% CO₂. MIC endpoints were read as the concentrations at which no growth, or a significant reduction of growth, was observed by visual inspection after incubation.

Results: The MIC90s and ranges for solithromycin and comparator drugs are shown in the Table.

	MICs (µg/ml)	
	MIC Range	MIC 90%
Solithromycin	≤0.002-0.03	0.015
Penicillin	1-2	2
Amoxicillin/Clavulanate	0.12-1	1
Cefdinir	8-16	16
Cefpodoxime	>32	>32
Azithromycin	0.03-0.12	0.12
Clarithromycin	≤0.015-0.06	0.06
Doxycycline	0.03-0.25	0.12
Trimethoprim/Sulfa	1/19-4/76	4/76

Conclusion: The MICs of solithromycin for 100% of the twenty-four clinical strains of *B. pertussis* tested were ≤0.03 µg/ml and solithromycin was more active than older macrolides. Solithromycin, which has been shown to have broad coverage against other respiratory pathogens, may also be effective against *B. pertussis*.