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

D.J. HARDY1, D. VICINO2 and P. FERNANDES2

University of Rochester Medical Center, Rochester, New York • Cempra, Inc., Chapel Hill, North Carolina, USA

E-1187a

Materials and Methods

**Introduction**

Pertussis is a disease of neonates and young children but in recent years increasing cases of pertussis have been noted in young and older adults. The replacement of the old cellular pertussis component of DTP with the safer acellular vaccine has led to decreased immunity in populations (1). In California, 9000 cases of whooping cough were reported in 2012. This and other outbreaks clearly indicate that older children and adolescents need lasting immunity. Until a newer safe vaccine is developed, we are faced with treating pertussis in young adults and parents exposed to infected infants also get pertussis. Pertussis in the adult is often difficult to recognize and appropriate treatment may not be administered. Older macrolides were safely used to cover a broad spectrum of respiratory pathogens. More recently, however, resistance to older macrolides has increased in respiratory pathogens. Solithromycin (CEM-101), a fourth generation macrolide and the first fluoroketolide, is currently in Phase 3 trials for moderate to severe Community Acquired Bacterial Pneumonia (CABP). Solithromycin has been shown to be active against pneumococcus, Moraxella catarrhalis, Haemophilus spp., Legionella spp., Chlamydia pneumoniae, Mycoplasma pneumoniae, MSSA and CA-MRSA among other CABP pathogens. Pertussis in young and older adults could masquerade as CABP, we determined the minimum inhibitory concentrations (MICs) of solithromycin and comparator drugs for Bordetella pertussis.

**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 x 10⁷ CFU/ml. 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. The MIC of solithromycin for 100% of the twenty-four clinical strains of B. pertussis was <0.002 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.

**Conclusions**

The MIC of solithromycin for 100% of the twenty-four clinical strains of B. pertussis tested was <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.

**References**