Antimicrobial Characterization of CEM-101: Activity Against 331 Respiratory Tract Pathogens Including Multidrug-Resistant Pneumococcal Serogroup 19A Isolates

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ABSTRACT

Background: CEM-101 (1), a novel macrolide-ketolide, exhibited potent activity against bacterial pathogens causing respiratory tract infections, with the exception of Streptococcus pneumoniae (S. pneumoniae). When compared to clindamycin (CL), CEM-101 showed superior activity, especially against strains resistant to erythromycin and clindamycin.

Methods: A total of 331 respiratory tract isolates were tested using the broth microdilution method (CLSI). Minimum inhibitory concentrations (MICs) were determined against S. pneumoniae; Streptococcus pyogenes (S. pyogenes), Streptococcus pyogenes, Streptococcus anginosus, Streptococcus mitis, Streptococcus intermedius, and Streptococcus anginosus; Haemophilus influenzae (H. influenzae); Haemophilus parainfluenzae (H. parainfluenzae); Haemophilus aphrophilus (H. aphrophilus); Haemophilus influenzae; Moraxella catarrhalis (M. catarrhalis); Group A beta-hemolytic streptococci (β-hemolytic strains); and Enterococcus faecalis (E. faecalis). Susceptibility breakpoints for CEM-101 and CEM-101 were determined.

Results: Among the strains tested, CEM-101 was the most active agent tested against S. pneumoniae. CEM-101 was superior to erythromycin and clindamycin, and there was no need to adjust either erythromycin-resistant streptococci or clindamycin-resistant enterococci. Eighteen of 19A strains exhibited high levels of non-susceptibility to clindamycin (MIC > 1 μg/ml), except one (MIC = 0.5 μg/ml). The CEM-101 MIC was > 4 μg/ml for all 19A strains. Table 4 shows excellent CEM-101 potency against streptococci, MRSA, C. jejuni, and diverse activity against strains resistant to erythromycin and clindamycin.

Conclusions: CEM-101 is a promising new antibiotic agent with enhanced activity against respiratory tract pathogens, especially against erythromycin- and clindamycin-resistant strains.

Introduction

Recent studies have shown that the pneumococcal conjugate vaccine (PCV-13) has reduced the incidence of invasive pneumococcal disease (IPD) and community-acquired pneumonia (CAP) caused by serotypes covered by the vaccine. However, the impact of PCV-13 on drug-resistant pneumococci is not known.

Materials and Methods

1. CLSI Methods for Antimicrobial Susceptibility Testing and Quality Control; 2008

Results

1. Table 1: Activity of CEM-101 against Streptococcus pneumoniae isolates
2. Table 2: Activity of CEM-101 against Group A streptococci
3. Table 3: Activity of CEM-101 against Moraxella catarrhalis isolates
4. Table 4: Activity of CEM-101 against Enterococcus faecalis isolates

Discussion

1. CEM-101, a novel macrolide-ketolide, exhibited potent activity against streptococci, MRSA, and various Gram-positive pathogens including strains resistant to erythromycin and clindamycin. CEM-101 showed complete activity against MRSA, pneumococci (MIC ≤ 0.25 μg/ml), and was two-fold more active than levofloxacin and Q/D.

1. CEM-101 also inhibited Gram-negative species associated with CA-RTI (Table 4). CEM-101 appears to be an attractive candidate for treatment of CA-RTI, offering potency and spectrum advantages over levofloxacin and clindamycin.

References