

Ceftaroline Activity When Tested Against Respiratory Tract Infection Pathogens Isolated From USA Medical Centers in 2009

P.R. RHOMBERG, D.J. FARRELL, R.N. JONES, H.S. SADER

JMI Laboratories, North Liberty, Iowa, USA

Abstract

Background: Ceftaroline (CPT) is a novel broad-spectrum macrolide cephalosporin that has been advanced for clinical evaluation as a potential agent in respiratory tract infections (RTI) including MRSA and multidrug-resistant (MDR) S. pneumoniae (SPN).

Methods: 1,557 RTI and 128 blood culture (BC) isolates were collected from 2003 to 2005 from 25 different USA medical centers. Bacterial isolates included: S. aureus (SA), H. influenzae (HI), S. pneumoniae (SPN), E. coli (EC), Enterococcus spp. (ES), and other respiratory pathogens. Ceftaroline, the active component of the prodrug ceftaroline fosfomethyl pentahydrate (CPT), was performed by CLSI broth microdilution methods against CPT and comparator agents for RTI treatment.

Results: 

- **Organism Collection**
  - 1,557 RTI and 128 blood culture isolates were collected from 26 USA medical centers in 2009. 
  - 952 SA, 259 EC, 97 HI, 122 SPN, 20 K. pneumoniae, and 5 E. coli were included, respectively.

- **CPT and Comparator Antimicrobial Activity**
  - CPT could be a valuable agent for RTI therapy.
  - CPT was 8-16 fold more potent than penicillin. In contrast, very low susceptibility rates were observed for trimethoprim/sulfamethoxazole.
  - CPT activity against common respiratory tract bacterial pathogens is summarized in Table 1. 
  - CPT activity against M. catarrhalis (MIC90, 0.015 g/mL) was 8-16 fold more active than ceftriaxone (MIC90, 0.03 g/mL) when tested against penicillin-susceptible S. pneumoniae.
  - The highest ceftaroline MIC value was only 0.5 g/mL (Table 1 and 3).
  - Ceftriaxone and cefuroxime exhibited similar in vitro activities against commonly isolated respiratory pathogens. 

Conclusions

- Ceftaroline exhibited potent activity against the frequently isolated respiratory tract pathogens S. pneumoniae, H. influenzae, and M. catarrhalis, including strains with various resistance phenotypes.
- Ceftaroline was highly active against S. aureus, including strains with MDRSP, as well as not detectable with other agents.
- Ceftaroline activity against respiratory tract pathogens was similar to that of cefuroxime.
- These results indicate that ceftaroline is a promising and potentially effective therapeutic option for the treatment of respiratory tract infections in USA medical centers.

References

1. **Clinical and Laboratory Standards Institute (2009).** M07-A8. *Methods for determination of minimal inhibitory concentrations (MICS)* and minimal bactericidal concentrations (MBCs) for bacteria cultured in broth or on agar.


Acknowledgement

Supported by Premier Laboratory, Inc.