Antimicrobial Susceptibility Testing

Each isolate of S. pneumoniae was tested in phase I.

1. Primary screening was performed against erythromycin, clindamycin, gatifloxacin, and levofloxacin by disk diffusion. Each isolate was also tested against penicillin, gatifloxacin, and levofloxacin by the concentration gradient agar diffusion method (Etest).

2. A panel of isolates was tested against erythromycin, amoxicillin (beta-lactamase positive or negative), and levofloxacin by disk diffusion, and/or by Etest. Isolates with a MIC of >0.125 µg/ml and a GMI of ≥0.5 with GAT or LEV were considered resistant.

3. Etest methodology followed manufacturer’s guidelines (Becton-Dickinson, Sparks, MD, USA). Qualities of Etest and antimicrobial disks were performed following NCCLS and manufacturer’s guidelines.

Results

The results of the study are shown in Tables 1-4.

Introduction

It is estimated that Streptococcus pneumoniae accounts for 3800 deaths per year in the United States due to infections caused by bacteria, 500,000 cases of pneumonia and more than 7,000,000 cases of otitis media alone. The incidence and prevalence of disease in children and young adults are well documented. Because of the importance of timely and accurate results of susceptibility testing, there is an increase in resistance to penicillin and macrolides, the medical community is turning to other therapeutic agents to treat this pathogen. Fluoroquinolones are now recommended as first-line therapy for many infections, but they are not infrequently associated with resistance in respiratory strains of S. pneumoniae that are resistant to penicillin and macrolides. Resistance in fluoroquinolones is well documented in respiratory tract strains of S. pneumoniae but not nearly as well documented in sterile body sites such as blood, cerebral spinal fluid and others.

Materials and Methods

Isolated were collected between January 1, 2000, and December 31, 2001, from 124 geographically distributed centers in the USA and one center in Canada. Primary screening was performed to determine the current susceptibility and resistance of S. pneumoniae to penicillin, macrolides, and quinolones. Further testing was performed on S. pneumoniae isolates with levofloxacin MICs of ≥0.125 µg/ml with a battery of fluoroquinolones.

Discussion

The new fluoroquinolones continue to demonstrate in vitro activity against S. pneumoniae isolated from sterile body sites in this study. The Etest MICs of ≤0.75 µg/ml for gatifloxacin, levofloxacin, and moxifloxacin were consistent with other studies.

Conclusions

- Gemifloxacin showed no difference in its activity against S. pneumoniae isolates from sterile body sites.
- Gatifloxacin demonstrated the lowest MICs against S. pneumoniae from sterile body sites compared with gatifloxacin, moxifloxacin, and levofloxacin, including those isolates with potential first- and/or second-step mutations (quinolone-resistant specific).
- Gemifloxacin showed no difference in its activity against S. pneumoniae isolates from sterile body sites and respiratory tract sources.
- Increased prevalence of drug-resistant S. pneumoniae warrant continuous monitoring nationally and worldwide.

Acknowledgements


References