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Predicting fluoroquinolones ability to kill resistant Streptococcus pneumonia isolates expressing different genetic mutations: Target attainment analysis simulating therapeutic doses to patients with community acquired pneumonia

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Introduction: Streptococcal pneumonia is a major cause of morbidity and mortality worldwide. Fluoroquinolones are one of the mainstay drugs for treatment of these infections. However emerging resistance poses a threat to the class's future utility. Using Monte Carlo simulation, we evaluated the probable efficacy of ciprofloxacin, levofloxacin, gemifloxacin, garenoxacin, and moxifloxacin in eradicating infections and preventing continued growth of resistance.

Methods: Using patient data from strep pneumonia patients in hospitals and MIC data from the CROSS study; drug regimens were compared to see the likelihood of attaining fAUC₀₋₂₄/ MIC_{all} ratios depicting goal clinical outcomes.

Conclusions: Very few regimens are able to prevent further growth of resistant organisms when ParC mutations have occurred. Only garenoxacin and moxifloxacin were able to eradicate extremely resistant isolates in serum and ELF respectively

Biography

Ayman M Noreddin received his PhD in Pharmaceutical Sciences from the University of the Pacific, California and received research training as a visiting scholar at the Department of Medicine, Stanford University. He had Post-doctoral fellowship (Pharmacokinetics and Pharmacodynamics of Antimicrobials), Department of Medical Microbiology, University of Manitoba followed by an American College of Clinical Pharmacy postdoctoral fellowship (Infectious Diseases). His research interest includes Pharmacokinetic/Pharmacodynamic modeling of anti-infective and anti-cancer therapy, clinical simulation and Monte Carlo analysis and bacterial resistance in biofilm studies. He has outstanding records of scientific and academic accomplishments with multiple research funding, numerous publications in highly prestigious journals and various presentations in both national and international conferences. He served as a scientific reviewer for the NIH as well as other national and international research institutions.

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