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

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Abstract

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 $fAUC_{0-24}/ MIC_{all}$ 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:

Dr. Noreddin received his Ph.D. 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 postdoctoral 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). Dr. Noreddin's research interest includes Pharmacoklinetic/Pharmacodynamic modeling of anti-infective and anti-cancer therapy, clinical simulation and Monte Carlo analysis and bacterial resistance in biofilm studies. Dr. Noreddin 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.

Speaker Publications:

1. "Plasmodium falciparum Histidine-Rich Protein 2 and 3 Gene Deletions and Their Implications in Malaria Control."
2. "First Genome Sequence of Brucella abortus Biovar 3 Strain BAU21/S4023, Isolated from a Dairy Cow in Bangladesh".
3. "Cefiderocol: A Siderophore Cephalosporin with Activity Against Carbapenem-Resistant and Multidrug-Resistant Gram-Negative Bacilli"
4. "The impact of Catechol-O-methyl transferase knockdown on the cell proliferation of hormone-responsive cancers"
5. "Molecular Detection and Antibiotyping of Multidrug-Resistant Salmonella Isolated from Houseflies in a Fish Market"

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