Revised Abstract

Background: Delafloxacin (DFX) is a novel fluoroquinolone with unique chemical and pharmacological properties that distinguish it from existing members of its class. In addition to its unique chemical structure, DFX has a broad-spectrum, including many Gram-positive pathogens, which are often resistant to standard fluoroquinolones. DFX is currently in clinical trials and has shown promise in clinical trials for the treatment of infections caused by multiple pathogens, including methicillin-resistant Staphylococcus aureus (MRSA). The aim of the current study was to determine the time to bacterial kill and the concentration-dependent activity of DFX against a panel of Gram-positive pathogens.

Methods: A panel of Gram-positive pathogens was used to determine the concentration-dependent activity of DFX. The MICs were determined using the broth microdilution method according to the Clinical and Laboratory Standards Institute (CLSI) guidelines. The time to bacterial kill was determined by monitoring the bacterial growth over time in the presence of DFX at sub-MIC and MIC concentrations.

Results: DFX exhibited a broad-spectrum activity against the panel of Gram-positive pathogens. The MICs were found to range from 0.008 to 1.0 μg/mL. The time to bacterial kill was found to be dependent on the concentration of DFX. At sub-MIC concentrations, DFX exhibited a bacteriostatic effect, while at MIC concentrations, it exhibited a bactericidal effect.

Conclusions: DFX exhibited a broad-spectrum activity against the panel of Gram-positive pathogens. The time to bacterial kill was found to be dependent on the concentration of DFX. These findings suggest that DFX has the potential to be a valuable addition to the treatment of infections caused by Gram-positive pathogens, including MRSA.