EV0133

ePoster Viewing

Antimicrobials: in vitro antibacterial susceptibility

Mutant prevention concentration (MPC) values for ciprofloxacin with Gram-negative respiratory pathogens and considering ciprofloxacin dry powder for inhalation (ciprofloxacin DPI) pulmonary drug concentrations

J.M. Blondeau[1], S. Shebelski[2]

[1]*Royal University Hospital, Saskatoon- Saskatchewan, Canada*

[2]*Royal University Hospital, Saskatoonc, Canada*

Objectives: Ciprofloxacin has low minimum inhibitory concentration (MIC) values against susceptible strains of *Enterobacteriaceae*, *Haemophilus* species and slightly higher MIC values against susceptible strains of *Pseudomonas aeruginosa*. MPC values are proportionate to the MIC values. Mean pulmonary drug concentrations for Ciprofloxacin DPI, dose of 32.5 mg, have been reported to range from 35->409 mg/L in study patients with structural lung disease. We determined and compared ciprofloxacin MPC values for various pathogens with Ciprofloxacin DPI pulmonary drug concentrations.

Methods: MIC and MPC values were measured for ciprofloxacin against clinical strains of *Escherichia coli*, *Klebsiella pneumoniae*, *Enterobacter cloacae*, *Haemophilus influenzae* and *Pseudomonas aeruginosa*. MIC testing used 10^5 cfu/ml in appropriate media with doubling drug dilutions with incubation under optimal conditions (temperature and atmosphere) and MPC testing utilized 10^{10} CFUs on agar media containing drug in doubling dilutions with incubation under ideal conditions. The lowest drug concentration blocking growth was the MIC or MPC, depending on method.

Results: MIC_{90} (mg/L) and MPC_{90} (mg/L) values for ciprofloxacin against *E. coli* (n=20), *K. pneumoniae* (n=20), *E. cloacae* (n=20), *H. influenzae* (n=26) and *P. aeruginosa* (n=55) respectively were as follows: 0.25/0.5, 0.25/1, $\leq$0.06/1, 0.016/0.5, 0.5/4. MPC/MIC ratios respectively were 2, 4, 16, 32, 8. Mean pulmonary drug concentration (35-409 mg/L) would exceed the lowest (0.5 mg/L) and highest (4 mg/L) MPC_{90} values by 70-818 X and 9-102 X respectively.

Conclusion: Ciprofloxacin DPI drug concentrations in the respiratory tract are substantially higher than those achievable by oral or IV dosing. Ciprofloxacin DPI delivers high concentrations of ciprofloxacin to the lung which were at least 9 times higher than the highest MPC_{90} values for the isolates reported here. This suggests drug concentrations well in excess of the mutant selection window and a low propensity for resistance selection.