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2nd World Congress and Exhibition on

Antibiotics and Antibiotic Resistance

October 13-15, 2016   Manchester, UK

Comparative pharmacodynamics of selected antimicrobials against *Escherichia coli* strains isolated from dogs

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Understanding the antimicrobials' pattern of bacterial killing can both ensure therapeutic efficacy and prevent the development of resistance. The scope of this study was to explore the pharmacodynamics of selected bactericidal agents, namely Amikacin (AMK), Amoxicillin/Clavulanic acid (AMC), Ceftazidime (CAZ), Marbofloxacin (MAR) and Enrofloxacin (ENR), against *Escherichia coli* strains isolated from dogs. Minimum Inhibitory Concentrations (MICs) were determined against clinical and commensal *E. coli* strains (n=5) by the macro-dilution method. Interpretation of MIC values was performed according to CLSI and EUCAST guidelines. Based on MIC results, kill curves were studied by viable counts determination. The Area Between the Bactericidal and the Control curves (ABBC) was selected as the antimicrobial effect (E) index, whereas maximum effect (Emax) and half maximal effective concentration (EC50) values were obtained by use of the Sigmoidal Emax model. The ratio of EC50 to MIC was also determined. Investigational strains displayed considerable variability in their susceptibility (susceptible, intermediately susceptible and resistant). In terms of Emax, AMK yielded higher ABBC values than all other antimicrobials, altogether with a lower EC50 to MIC ratio, indicating that a substantial bactericidal effect of 50% of Emax can be observed at levels down to 0.34×MIC. MAR required levels higher than 0.6×MIC to yield a half maximal effect. On the other side of the spectrum, CAZ displayed low efficacy. Interestingly, it was the most potent drug (MIC=1μg/mL, EC50=0.12μg/ml). Integration of the findings of this study with pharmacokinetic data could provide insight regarding the predicted efficacy by current dosage schemes of the specific antimicrobials in dogs.

Biography

Georgios A Delis is a Lecturer in Veterinary Pharmacology in the School of Veterinary Medicine, Aristotle University of Thessaloniki, Greece. He has published research on pharmacokinetics, pharmacodynamics and pharmacokinetic/pharmacodynamic correlation of antimicrobial agents as well as on analytical methods for the determination of drugs in biological fluids.

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J Drug Metab Toxicol 2016
ISSN: 2157-7609, JDMT an open access journal

Antibiotics 2016
October 13-15, 2016

Volume 7, Issue 3 (Suppl)

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