Evaluation of feline urine concentrations of amoxicillin and clavulanate

Kallie Woodruff, Kate KuKanich, Butch KuKanich, Mark Papich, Hyun Joo, Zackery Bieberly, Joshuah Klutzke, Ron Orchard, and Lucy Schermerhorn

Departments of Clinical Sciences (Woodruff, K KuKanich, Orchard, Schermerhorn) and Anatomy and Physiology (B KuKanich, Joo, Bieberly, Klutzke), Kansas State University, College of Veterinary Medicine, Manhattan, KS; Department of Molecular Biomedical Sciences, CVM, North Carolina State University, Raleigh, NC (Papich).

Urinary tract infections are routinely diagnosed in domestic cats, and the recommended empirical antimicrobial treatment of choice is amoxicillin or amoxicillin-clavulanate. However, the Clinical and Laboratory Standards Institute (CLSI) recommends use of a conservative soft tissue breakpoint (S≤0.25 µg/mL) for feline urine culture & susceptibility reports. Determination of feline urine antimicrobial concentrations of these agents can provide the necessary data to establish feline urine-specific breakpoints. This study aimed to establish urine concentrations of amoxicillin and clavulanate after oral dosing. Eleven healthy young research cats were administered three 62.5 mg doses of amoxicillin-clavulanate orally at twelve hour intervals. Following the third dose, the urine of each cat was collected from litter pans or via cystocentesis over a 28 hour period, with a minimum of 3 urine samples collected per cat. The time and volume of each urination was recorded. Ultra-high pressure liquid chromatography with triple quadrupole mass spectrometry was used to determine the urine concentrations of amoxicillin and clavulanate. Preliminary data analyses showed that amoxicillin concentrations were greater than 8 µg/mL in all urine samples collected prior to 12 hours, with a urine half-life of approximately 2 hours. Clavulanate was detected in all urine samples prior to 12 hours, with a urine half-life of approximately 2.5 hours. These results support establishing a feline urine-specific breakpoint of 8 µg/mL for amoxicillin and amoxicillin-clavulanate, similar to the CLSI established urine-specific breakpoint in dogs.

Research Grant- Winn Feline Foundation

Student Support- Morris Animal Foundation; KSU Veterinary Research Scholars Program and CVM Office of Research