Antimicrobial Resistance in Canine and Feline Urinary Pathogens: A One Health Perspective

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Urinary tract infection (UTI) is defined as the presence of bacteria (or another infectious agent) associated with a local inflammatory process and clinical signs. UTIs are considered uncommon in healthy adult cats, whereas in dogs they are relatively more frequent, especially in immunocompromised individuals. In this context, the aim of this study was to conduct a retrospective analysis of urine samples from dogs and cats presenting clinical signs of urinary tract disease, submitted to a veterinary microbiology laboratory, focusing on the main isolated microorganisms and their antimicrobial susceptibility profiles. An increase in the number of microbiological test requests was observed over the years. Urine samples collected between 2005 and 2012 accounted for 23.4% (120/513) of the total analyzed. In subsequent years, a sustained high demand was observed, with 23.2% (119) in 2013, 23.4% (120) in 2014, and a peak in 2015, representing 30% (154) of the samples. Of the total 513 samples, 69.6% (357) were from dogs and 30.4% (156) from cats. Among these, 232 (45.2%) showed no bacterial growth, while 27.1% (139) corresponded to Gram-positive bacteria and 27.7% (142) to Gram-negative bacteria. The main microorganisms isolated were *E. coli* (26.3%) and *Staphylococcus* (25.6%), followed by *Streptococcus* (21.5%) and *Proteus* (7.8%), demonstrating a typical etiological profile of urinary tract infections in small animals. Antimicrobial susceptibility testing was performed according to the CLSI guidelines applicable at the time. The antimicrobials most frequently evaluated included enrofloxacin, norfloxacin, ciprofloxacin, florfenicol, ampicillin, amoxicillin, amikacin, cephalexin, and ceftriaxone. Among these, ampicillin (50.46%), amoxicillin (46.41%), and cephalexin (35.64%) showed the highest resistance rates, whereas amikacin (16.59%), florfenicol (18.67%), and ceftriaxone (22.4%) demonstrated greater effectiveness. Fluoroquinolones, widely used in the treatment of urinary infections, showed intermediate resistance levels, ranging from 27.95% to 31.54%. High resistance rates were also observed for sulfonamides (77.55%), streptomycin (74.55%), and tetracycline (60.38%). From a One Health perspective, these findings are particularly relevant, as several antimicrobial classes evaluated in this study—such as β-lactams, fluoroquinolones, macrolides, and aminoglycosides—are widely used in both veterinary and human medicine. The high frequency of resistance observed suggests the presence of similar selective pressures across different settings, favoring the maintenance and dissemination of resistant microorganisms in environments shared by humans and companion animals. Furthermore, the close contact between pet owners and their animals facilitates the bidirectional transmission of bacteria and mobile genetic elements, such as plasmids carrying antimicrobial resistance genes, thereby increasing the potential for dissemination within households and the community. This scenario highlights the importance

of understanding infections in small animals not as isolated clinical events, but as part of an interconnected system involving human, animal, and environmental health. Thus, the present findings reinforce the role of microbiological diagnostics as a key tool for the rational use of antimicrobials and for addressing antimicrobial resistance within the One Health framework.

Agradecimentos: