

Frequency and Possible Clinical Implications of *Escherichia coli* ST131 in Urinary Tract Infections in dogs in São Paulo, Brazil

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INTRODUCTION

Escherichia coli causing urinary tract infection (UTI) is prevalent in small animal practice. Analyzing *Escherichia coli* sequence types (STs) provide valuable insights into the epidemiology and pathogenesis of UTIs. *E. coli* ST131 (*E.coli*-ST131) isolates are highly pathogenic, because: broad spectrum, several virulence-associated genes, and for affecting humans widespread. Conversely, *E.coli*-ST131 causing UTIs in dogs remains less explored. The main aim of this study was to investigate the frequency of *E.coli*-ST131 in canine UTIs.

METHODS

Sixty *Escherichia coli* isolates from dogs with UTI were selected (March to May 2023). Identification and antimicrobial susceptibility testing were performed (Phoenix[®] automated system), bacterial DNA was submitted to identify ST131 by PCR.

RESULTS

According to Clermont classification, nine isolates (15%) were B2 phylogenetic group, and six of them (10%) were ST131. Mixed-breed dogs represented the largest group (31.7%), followed by Golden Retrievers (13.3%), Shih Tzus (8.3%), and Schnauzers (6.7%). Dogs over 7 years old were 73.3%, while younger age groups were: under 1 year (1.7%), 1–4 years (6.7%), and 4–7 years (18.3%). Female dogs were 61.4% (males 38.3%).

The antimicrobial resistance profile revealed varying levels of resistance, and the main were amoxicillin–clavulanic acid (33.3%), ampicillin (55%), ampicillin–Sulbactam (36.7%), cephalexin (33.3%), cefovecin (33.3%), ceftriaxone (43.3%), doxycycline (26.7%), enrofloxacin (36.7%), levofloxacin (15%), marbofloxacin (35%), norfloxacin (35%), and sulfamethoxazole–Trimethoprim (26.7%).

DISCUSSION AND CONCLUSION

This study highlights the presence of this highly pathogenic sequence type in 10% of canine UTIs caused by *Escherichia coli*. Additionally, the B2 phylogenetic group, often associated with extraintestinal virulent strains, accounted for 15% of the cases. So, a well-documented pathogen in human may also play a significant role in canine UTI, underscoring the potential for interspecies transmission and the need for further research focusing on virulence factors, antimicrobial resistance, and clinical implications within the One Health framework.

REFERENCES

- Adamowicz J, et al. Reconstructive urology and tissue engineering: converging developmental paths. *Journal of Tissue Engineering and Regenerative Medicine*. 13(3):522–533, 2019.
- Clarke DL. Feline ureteral obstructions part 2: surgical management. *Journal of Small Animal Practice*. 59(7):385–397, 2018.
- Hardie EM, Kyles AE. Management of ureteral obstruction. *Veterinary Clinics of North America: Small Animal Practice*. 34:989–1010, 2004.
- Kyles AE, et al. Management and outcome of cats with ureteral calculi: 153 cases (1984–2002). *Journal of the American Veterinary Medical Association*. 226(6):937–44, 2005.
- Roberts SF, et al. Postoperative mortality in cats after ureterolithotomy. *Veterinary surgery*. 40(4):438–443, 2011.
- Wormser C, et al. Outcomes of ureteral surgery and ureteral stenting in cats: 117 cases (2006–2014). *Journal of the American Veterinary Medical Association*. 248(5):518–525, 2016.

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