Prevalence and trends in antimicrobial resistance of bacteria from canine urinary tract isolates from an Australian referral hospital over a five-year period

Maddie Roberts

Small Animal Specialist Hospital, Sydney, Australia

OBJECTIVES

To identify the prevalence of bacteria from canine urine tract isolates and to assess for any trends in antimicrobial resistance of the most frequently identified isolate over a five-year period from a referral hospital in Australia.

METHODS

Retrospective analysis of positive canine urinary bacterial cultures between January 2013 and December 2017

inclusive. Bacteria were classified as sensitive, intermediate or resistant, with intermediate and resistant grouped together as 'non-susceptible'. Resistance of the most prevalent bacteria towards select antimicrobials (when evaluated in over 100 isolates) was examined using Chi squared or Fisher's exact test for low cell frequencies with a p-value of <0.05 of statistical significance.

RESULTS

A total of 382 positive cultures returned with 412 bacterial isolates. Of these, 27 were polymicrobial (≥ 2) cultures. *Escherichia coli* was the most prevalent bacteria (49.5%), followed by *Proteus sp.*, *Staphylococcus sp.*, *Enterococcus sp.*, *Klebsiella sp.*, and *Pseudomonas sp.* respectively (12.3; 12.0; 9.7; 5.0 and 4.2%). Antimicrobials where over 100 *E. coli* isolates were evaluated included amoxicillin-clavulanate, trimethoprim-sulphonamide, amoxicillin, enrofloxacin and doxycycline. When comparing resistance of *E. coli* in 2013 against each year, and 2013 to the final study year there were no statistically significant trends in antimicrobial resistance towards any of the antimicrobials evaluated.

STATEMENT (CONCLUSIONS)

E. coli was the most prevalent bacteria isolated in canine urine samples at our institution, similar to what has been described elsewhere. There were no significant trends in resistance of *E. coli* towards any of the antimicrobials evaluated during our study period.

Patterns of antimicrobial resistance in canine wound infections from two large scale electronic datasets

**Laura Holloway, Jonathan Massey,
Fernando Sánchez-Vizcaíno, Tristan Cogan,
Andrew Dowsey, Michael Tivers**

University of Bristol, Bristol, United Kingdom

OBJECTIVES

To investigate temporal trends in sensitivity profiles and multi-drug resistance of bacteria cultured from wounds in dogs in the United Kingdom.

METHODS

Two datasets of culture and sensitivity results from samples taken from wounds in dogs were retrospectively analysed. Dataset 1 (D1) was sourced from a commercial laboratory (2011–18), whilst dataset 2 (D2) was sourced from four laboratories compiled by the Small Animal Veterinary Surveillance Network (SAVSNET) (2010–2017). Statistical analyses were conducted using R language. Temporal trends were analysed following orthogonal polynomial and forward difference coding with either a mixed effects binomial logistic regression model (D1) when data included practice postcode to counteract clustering, or a binomial logistic regression model (D2).

RESULTS

D1 contained 9302 samples, 5858 of which had specific bacteria isolated, whilst D2 contained 10,024 samples with bacterial species isolated. Significant ($p < 0.05$) temporal observations which correlated across both datasets were seen. There were reductions in both amoxicillin-clavulanic acid (D1 73.3% to 22.2%; D2 54.1% to 23.5%) and marbofloxacin (D1 59.1% to 23.8%; D2 51.4% to 19.7%)

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resistance in *Staphylococcus aureus* and enrofloxacin and marbofloxacin resistance (both D1 34.7% to 5.8%; D2 18.2% to 1.0%) in *Escherichia coli*. A reduction in multi-drug resistant *Staphylococcus aureus*, defined as resistance to 3 or more antimicrobial categories, was also observed (D1 72.7% to 27.0%; D2 55.5% to 26.4%).

STATEMENT (CONCLUSIONS)

Significant observations in both datasets suggest a reduction in antimicrobial resistance in organisms recognised as nosocomial pathogens. This may reflect an increased awareness of antimicrobial resistance among practising vets and hence more responsible use of antimicrobials.

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