RESULTS

The mean serum IS concentration dropped significantly from 1637.6 mg/L (day 0) to 650.6 mg/L (day 56) in the treatment group ($p = 0.0058$) while no significant change was observed in the control group (from 323.8 mg/L on day 0 to 599.7 mg/L on day 56; $p = 0.5670$).

STATEMENT (CONCLUSIONS)

Daily administration of renaltec reduced serum IS levels by more than 60% in this cohort of cats after 8 weeks of treatment. Further studies are needed to investigate the effects of renaltec on IS levels in cats with confirmed CKD.

Prevalence and characterization of urinary cultures in owned dogs and cats from Spain

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OBJECTIVES

Due to the lack of information among urinary tract infection (UTI) in Spain, our objective is to describe the prevalence and characterization of urinary tract pathogens in urine samples from dogs and cats with urinary clinical signs.

METHODS

This is a cross-sectional study with records of canine and feline urine cultures from all Spain during a one-year

study period (March 2017–2018). The urine samples were collected from dogs and cats with clinical signs of UTI and delivered by the veterinary on duty to Idexx's laboratories for culture.

RESULTS

A total of 9,957 (6772 canine; 3185 feline) urinary cultures were performed with 34.6% yielded positive. Although 110 different bacterial and fungal species were isolated, only 7 bacterial genera accounted for 90.6% of the urinary isolates, including: *Escherichia coli* (49.56%), *Proteus* spp. (12.12%), *Enterococcus* spp. (9.80%), *Staphylococcus* spp. (8.40%), *Klebsiella* spp. (4.55%), *Pseudomonas* spp. (4.03%), and *Streptococcus* spp. (2.11%). Among these genera, dogs had a generally higher predisposition than cats did, 39.29% and 24.7% respectively. Distributions of UTI diagnosis tended to be similar between species, although *Enterococcus* spp. had been more prevalent in cats. Infection with single bacteria was responsible for 93.76% of UTI in both species.

STATEMENT (CONCLUSIONS)

Given the results of the present study, canine and feline UTI in Spain can be characterized as follows: (1) bacterial UTIs were more prevalent than in previous reports; (2) the vast majority of canine UTI were caused by single bacteria; (3) *Escherichia coli* was singularly the most prevalent agent in canine and feline UTI.

Canine urinary extracellular vesicles as bactericidal agents *in vitro*

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OBJECTIVES

Urinary extracellular vesicles (UEVs) from healthy human volunteers exhibit bactericidal activity *in vitro* which is independent of the bacteriostatic urinary protein, uromodulin. Thus, UEVs are postulated to be innate immune effectors of the urinary tract. This study aimed to evaluate the bactericidal activity of canine UEV preparations.

METHODS

Free-catch urine samples were collected from client-owned dogs. Triplicate aliquots of UEVs isolated by differential centrifugation were co-incubated with luminescent BL21 *E. coli*, previously transfected with the *luxCDABE* operon. Luminescence was determined half-hourly and area under the growth curve (AUC) calculated. UEVs were classified as bactericidal if AUC of BL21 *E. coli* co-incubated with UEVs was significantly lower

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than AUC of BL21 *E.coli* co-incubated with phosphate buffered saline (control). Statistical comparisons were made using the Student's t-test. UEV preparations were immunoblotted for TSG101 (canonical UEV marker) and uromodulin, and quantified by densitometry.

RESULTS

Samples were collected from 13 dogs (8 males, 5 females). UEVs from eleven dogs were classified as bactericidal (7 males and 4 females) and two as non-bactericidal. Uromodulin content of UEV preparations was not different between those with and without

bactericidal activity. Furthermore, UEV preparations that were non-bactericidal did not contain fewer UEVs (based on TSG101 densitometry) compared to bactericidal preparations, which could indicate bactericidal dysfunction of UEVs within these individuals.

STATEMENT (CONCLUSIONS)

Canine UEV preparations from most dogs demonstrated *in vitro* bactericidal activity, therefore UEVs may also be innate immune effectors of the urinary tract in dogs. However, further work to exclude a bacteriostatic effect of canine uromodulin is warranted.

Developing methods to study the endothelial glycocalyx in cats

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OBJECTIVES

The study objectives were: to visualise the endothelial glycocalyx for the first time in cats; to validate assays to quantify serum glycocalyx breakdown products (sulphated glycosaminoglycans [sGAG] and hyaluronan [HA]) in cats; and to compare serum glycocalyx breakdown products in healthy cats with those with hyperthyroidism and chronic kidney disease (CKD).

METHODS

Uterine artery samples from healthy cats undergoing routine neutering were perfused with 0.1% Alcian

blue/2.5% glutaraldehyde/0.1M sodium cacodylate and fixed with 2.5% glutaraldehyde/0.1M sodium cacodylate, then visualised using transmission electron microscopy. Validation of an Alcian blue assay and commercially available ELISA were performed for measurement of sGAG and HA, respectively, in cat sera. Serum HA was measured in cats with hyperthyroidism (n = 9), CKD (n = 6) and in healthy cats (n = 9) and compared across groups by Kruskal-Wallis testing.

RESULTS

Median (range) glycocalyx depth in uterine artery was 64.44 (37.28–119.34)nm. Non-specific binding in serum, particularly to albumin, prevented reliable measurement of sGAG with the Alcian blue assay. The HA ELISA was reliable. Median (range) HA in cats with hyperthyroidism, CKD and in healthy cats was 118.40 (50.11–636.88)ng/ul, 155.06 (41.17–517.00)ng/ul and 184.74 (62.92–532.36) ng/ul, respectively, with no significant difference across groups (P = 0.778).

STATEMENT (CONCLUSIONS)

Definitive glycocalyx visualisation will facilitate its future study *ex vivo*. The HA ELISA enabled measurement of serum HA as a glycocalyx breakdown product in cats but HA was not significantly different across healthy cats and those with hyperthyroidism or CKD. However, this study was likely underpowered and larger studies are needed to evaluate glycocalyx breakdown in these diseases.