The effect of increasing levels of potassium chloride on urine specific gravity, urine volume, and relative supersaturation in dogs and cats

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OBJECTIVES

This study investigated the effect of KCl on urine dilution and calcium oxalate (CaOx) relative supersaturation (RSS).

METHODS

One base formula was supplemented with KCl to reach [K+] of 1.56, 3.35 and 4.62 g/Mcal (diets A, B and C respectively). Nine cats and 5 dogs were fed each diet for 10 days. Water intake and urine volume were recorded. Urinary ions were measured on pooled sample using

ionic chromatography. CaOx RSS was calculated using SUPERSAT software. Mixed effect models assessed the effect of diet on water intake, urine volume, urine specific gravity (USG), and CaOx RSS.

RESULTS

For cats, water intake was significantly higher on Diet C versus Diet A (Diet A: 22.4 ± 5.3 ml/kg/day; Diet B: 25.9 ± 6.0 ml/kg/day; Diet C: 28.5 ± 7.2 ml/kg/day, $P < 0.01$). Urine volume increased (Diet A: 8.5 ± 2.5 ml/kg/day; Diet B: 13.1 ± 1.7 ml/kg/day; Diet C: 15.4 ± 2.1 ml/kg/day, $P < 0.0001$), USG decreased with increasing KCl (Diet A: 1.070 ± 0.008 ; Diet B: 1.065 ± 0.007 ; Diet C: 1.060 ± 0.005 , $P < 0.0001$). CaOx RSS was lower on Diets B and C versus Diet A (Diet A: 2.55 ± 0.76 ; Diet B: 1.95 ± 0.60 ; Diet C: 1.65 ± 0.52 , $P < 0.01$).

For dogs, increasing KCl increased water intake (Diet A: 33.7 ± 3.0 ml/kg/day; Diet B: 38.7 ± 1.9 ml/kg/day; Diet C: 46.1 ± 1.9 ml/kg/day, $P < 0.0001$). Urine volume increased (Diet A: 20.2 ± 2.84 ml/kg/day; Diet B: 24.0 ± 2.77 ml/kg/day; Diet C: 33.8 ± 2.5 ml/kg/day, $P < 0.0001$), USG decreased (Diet A: 1.055 ± 0.008 ; Diet B: 1.048 ± 0.006 ; Diet C: 1.041 ± 0.004 , $P < 0.001$). CaOx RSS decreased (Diet A: 8.76 ± 0.140 ; Diet B: 7.05 ± 1.89 ; Diet C: 5.66 ± 0.95 , $P < 0.001$).

STATEMENT (CONCLUSIONS)

Increasing KCl leads to increased urine volume and decreased USG and CaOx RSS in healthy dogs and cats. KCl can be used as a nutritional strategy to decrease crystallisation risk.

Agreement between voided urine samples and cystocentesis samples for urine protein-to-creatinine ratio (UPC) determination in cats

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OBJECTIVES

To compare UPCs of urine obtained by cystocentesis with voided samples.

METHODS

Paired cystocentesis and voided urine samples were obtained within 23-hours from 43 cats presented to a referral hospital. Voided samples were collected from litter trays containing non-absorbent sand litter. Urine sediments were classified as active or inactive and UPCs were determined. Statistical analyses were performed using commercially available software for all samples and then separately according to sediment status. The difference between UPCs obtained from each method of collection was assessed using the Wilcoxon signed-rank test. Agreement between measurements was assessed using Passing-Bablok regression and Bland-Altman analysis. Agreement for proteinuria classification according to the International Renal Interest Society (IRIS) was assessed using Cohen's kappa.

RESULTS

UPCs ranged from 0.06 to 0.99. Twenty and twenty-three sediments were active and inactive respectively. Regardless of sediment status, statistically significant lower UPCs were observed in voided samples compared to cystocentesis samples. Passing-Bablok regression analysis revealed minimal constant and proportional

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