

Analysis and Culture Results of Free-Catch Urine Samples in Dogs

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Introduction

Urinalyses are a common diagnostic procedure in small animal medicine; however, the degree of contamination from free catch—a non-invasive method—lacks rigorous study. Free-catch urinalysis results are susceptible to diagnostic uncertainty due to suspected contamination of the sample or lack of sterility during collection. Therefore, the development of methods to reduce contamination in free catch is of diagnostic utility, as well as determining the contamination present in free catch samples. This study sought to assess degree of bacterial contamination between two methods of free-catch collection: cleaned peri-vulvar or preputial areas and uncleaned.

Purpose

Explore the diagnostic certainty of the least invasive method of urine collection by assessing contamination of free catch urine samples in canine subjects.

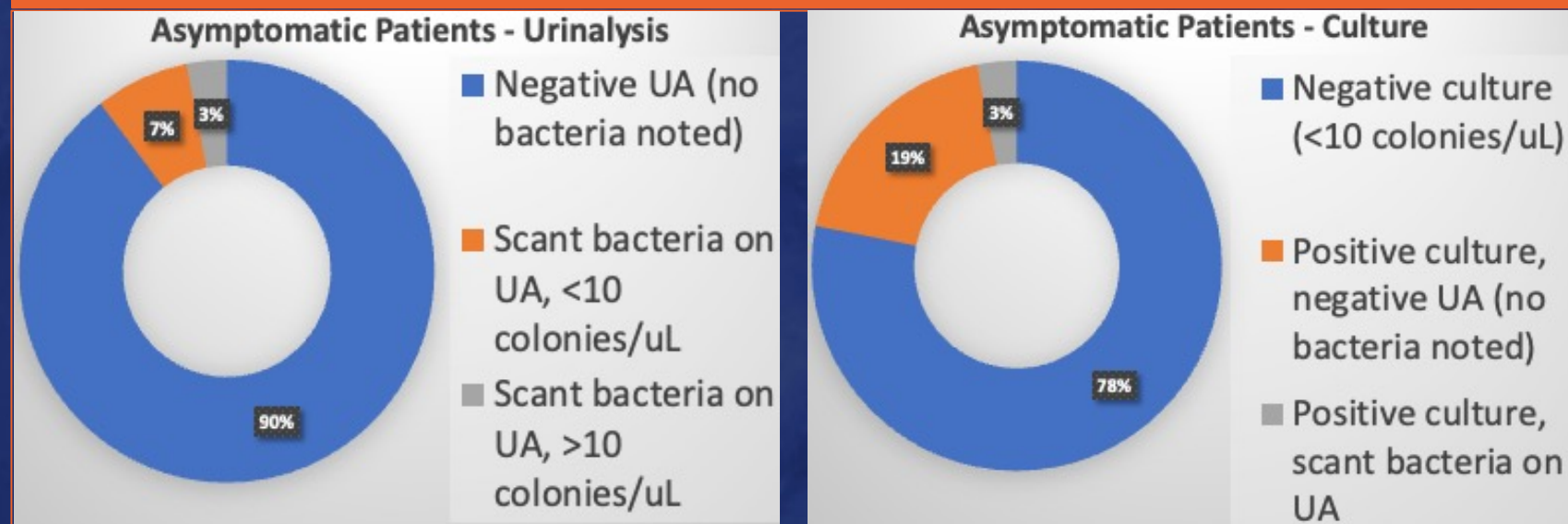
Methods

Dogs presented to the University of Florida were enrolled and randomized to either the control group (no sanitization) or experimental group (sanitized). A midstream, free-catch urine sample was collected, analyzed, and cultured. The samples were cultured on both MacConkey and blood agars to assess for bacterial growth, using three different volumes of urine (1 uL, 10 uL, and 200 uL). Chemical analysis of the urine samples was performed via Dipstick analysis, and microscopic analysis was performed on both wet mount urine slides and dry sediment.

References

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Data



Subjects Symptomatic for UTI

Confirmed lower UTI	3/4 (75%)
Confirmed preputial infection	1/4 (25%)
Total symptomatic subjects with confirmed UTI	4/100 (4%)

Subjects Asymptomatic for UTI – Positive UA

Subject	Positive UA	Negative Culture	Positive Culture
Male Uncleaned	4/10	2/7	2/3 (1/2 homogenous)
Male Cleaned	2/10	1/10	1/3 (homogenous)
Female Uncleaned	2/10	2/10	0
Female Cleaned	2/10	2/10	0
Total	10/96 (10.5%)	7/10 (3/7 C, 4/7 UC)	3/10 (1/3 C, 2/3 UC)

Subjects Asymptomatic for UTI – Positive Culture

Subject	Positive Culture	Negative UA	Scant Bacteria on UA
Male Uncleaned	12/21	10/18 (6/10 heterogenous, 4/10 homogenous)	2/3
Male Cleaned	6/21	5/18 (4/5 homogenous, 1/5 heterogenous)	1/3
Female Uncleaned	2/21	2/18 (heterogenous)	0
Female Cleaned	1/21	1/18 (homogenous)	0
Total	21/96 (21.88%)	18/21 (6/18 C, 12/18 UC)	3/21 (1/3 C, 2/3 UC)

Results

Of the 96 subjects asymptomatic for a UTI, 86 subjects (89.5%) did not reveal any bacteria on wet mount urinalysis. Of the 96 asymptomatic dogs, 75 (78.1%) had no clinically significant growth of bacteria on culture.

10 subjects (10.5%) showed evidence of bacteria on urinalysis, with 60% of samples coming from the control group. When these samples were cultured, 7 of those 10 samples had no clinically significant growth of bacteria on culture. Of the 3 samples with positive cultures, 2 samples grew only one bacterial morphotype (likely indicating an asymptomatic UTI), and 1 sample grew three bacterial morphotypes, likely indicating contamination of the sample.

Of the 21 cultured samples that grew >10 bacterial colonies per uL, 18 showed no evidence of bacteria on urinalysis, and 3 showed evidence of scant bacteria on UA. Of the 18 that did not show evidence bacteria on UA, 15 (83.3%) samples were from male subjects (10 [66.67%] uncleaned cohort, 5 [3.33%] cleaned cohort). Of the uncleaned samples from male subjects, 60% of samples showed multiple bacterial morphotypes on culture, indicative of contamination, and 40% showed one bacterial morphotype, indicative of asymptomatic infection. Of the cleaned samples from male subjects, 80% grew a single morphotype, and 20% grew multiple morphotypes, indicating a greater burden of presumably asymptomatic infections in these patients. Of the 3 female subjects with positive cultures, the uncleaned samples grew multiple morphotypes (indicative of contamination), and the cleaned subject grew one morphotype, indicative of asymptomatic infection.

Discussion

Clinically significant bacterial growth when cultured was seen with greater prevalence in the male cohort (18/21 [85.71%]), particularly from the non-cleaned group of male subjects (12/18 [66.67%]). Using heterogenous bacterial colonies as a marker for sample contamination, and homogenous bacterial colonies as a marker for asymptomatic infection, the majority of uncleaned male subject samples had a heavier burden of contamination, whilst the cleaned male subject sample had a heavier burden of asymptomatic infections. This same trend was observed in the female group, with cleaned subjects growing homogenous bacterial colonies, and uncleaned subjects growing heterogenous bacterial colonies.