University of Prince Edward Island

Faculty of Veterinary Medicine
Summary of Dissertation

Submitted in Partial Fulfilment
of the Requirements for the

DEGREE OF MASTER OF VETERINARY SCIENCE

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Assessment of proteinuria detection in dogs by visual and automated dipstick analysis and sulfosalicylic acid test compared with the urine protein:urine creatinine ratio

Proteinuria assessment is important in the clinical evaluation of canine patients. While dipstick and sulfosalicylic acid (SSA) tests are commonly used, discrepancies do occur. This study determined the prevalence of discordant results between visual dipstick analysis and the SSA test. Reliability of these two methods and automated dipstick analysis (Urisys 1100®) was also compared using the urine protein:urine creatinine (UPC) ratio as a reference method.

One hundred and eighty-six canine urine samples submitted to the Atlantic Veterinary College Diagnostic Services (AVCDS) Laboratory from May to December 2024 were included for analysis. Visual dipstick and SSA tests were assessed firstly by AVCDS, followed by two observers independently. Automated dipstick analysis was lastly performed once using the Urisys 1100®.

Discordance between visual dipstick and SSA test results was found in over half the cases (54.3 and 55.4%) analyzed by the two observers, and in 23.7% of the samples analyzed by AVCDS. However, no cases had a positive SSA and negative visual dipstick result. Most discordant samples had UPC ratios < 0.2, indicating clinically insignificant proteinuria.

Visual dipstick had noticeably stronger kappa agreement with UPC ratios than the SSA test and Urisys 1100®. The three methods all had strong to very

strong Spearman correlation with UPC ratios, and moderate to strong goodness of fit with logarithmically transformed UPC ratios in linear regression models. Visual dipstick analysis is more able than the SSA test in detecting proteinuria with low UPC ratios, which helps explain the discordance between the 2 methods. In-series interpretation of the visual dipstick and SSA method results is supported by our study. The Urisys® 1100 showed no diagnostic advantage over visual dipstick analysis, but may offer reproducibility, post-analytical and workflow benefits.

Publications

Yeung M, Clancey N, Gilroy C, McConkey S, Welch B. Canine hyperosmolar hyperglycemic syndrome and diabetic ketoacidosis. American Society for Veterinary Clinical Pathology Case Discussion at the 2024 American College of Veterinary Pathologists/American Society for Veterinary Clinical Pathology Annual Meeting, Seattle, WA, November 16-19, 2024

Presentations

Assessment of visual, automated urine dipstick analysis and sulfosalicylic acid test as methods for canine urine proteinuria quantification. Seminar, Department of Pathology and Microbiology, Atlantic Veterinary College, Charlottetown, PE, Canada. April 2025.

Reliability of dipstick methods in measuring canine proteinuria. Seminar, Department of Pathology and Microbiology, Atlantic Veterinary College, Charlottetown, PE, Canada. April 2024.

A case of feline dilated cardiomyopathy. Seminar, Department of Small Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, SK, Canada. 2022.

A case of canine gall bladder mucocoele. Seminar, Veterinary Teaching Hospital (Companion Animal), School of Veterinary Science, Massey University. 2017.

Biographical Data

Born in Hong Kong, Matthew graduated with a Bachelor of Veterinary Science from Massey University, New Zealand, in 2013. He worked in small animal general practice and emergency medicine in New Zealand before completing a Master of Veterinary Medicine (Companion Animal) through Massey University in 2020. After relocating to Canada in 2021, he completed a rotating internship and practiced as an emergency veterinarian at the University of Saskatchewan. In 2023, he joined the Department of Pathology and Microbiology at the Atlantic Veterinary College, University of Prince Edward Island, as a resident in clinical pathology and Master of Veterinary Science candidate.