

Dipstick urine analysis screening among asymptomatic dogs of k9 units

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Summary

The study was designed to determine the abnormal urine components such as red blood corpuscles, protein, bilirubin, nitrites, specific gravity, glucose, hydrogen ion, ketones, urobilinogen and leukocyte abnormality in k9 dogs urine. The present study was carried out on 135 asymptomatic dogs (65 males and 70 females) with age (2 – 8 years) in Al-Najaf governorate between February 2016 and April 2016. At morning, urine specimens were collected from dogs and tested via method of dipstick. Mass urinary screening is a suitable tool to detect dogs with asymptomatic progressive renal diseases, however the urinalysis can deliver to us information not merely about the kidneys and bladder, but also the liver, pancreas, and other organs, as well as, helping to make a diagnosis, in addition to determining a prognosis (a prediction of the consequence of the disease) and response to treatment. Results showed that 46 (34%) dogs were with urinary abnormalities, hematuria was the most frequent abnormality showed 28(60.9%), nitrituria 10(21.7%), proteinuria 4(8.7%), bilirubinuria in 2(4.3%) and decreased specific gravity 2(4.3%) respectively, pH (0%), glucose (0%), ketones (0%), urobilinogen (0%) and leukocyte (0%).

Keywords: Dipstick, k9 dogs, Urine analysis screening.

Introduction

A complete urine analysis includes physical examination, chemical tests, sediment examination and enzyme estimation (1). Urinalysis is considered as a main indicator in the estimation of the kidneys physiology, and liver function based on bilirubin measurement, metabolic disorder such as diabetes mellitus by detecting of urine glucose level and ketone bodies, and intravascular hemolysis as indicated by increased hemoglobin urine (2). The dipstick strips technique is a rapid testing method used for early finding of renal or urinary tract diseases (UTI) between asymptomatic patients to give a chance to prevent it from development of chronic renal failure (3). Proteinuria and hematuria were the primary signs of renal illness including membranous nephropathy, post infectious glomerulonephritis (4). On the other hand, the diagnose of urinary tract infection may be distinguished by founding noticeable nitrites in urine (5). Urinary tract infection (UTI) is most familiar in dogs with significant magnitudes on the kidneys functions which may lead to chronic kidney diseases; therefore it should be treated early to prevent the development and progression of diseases (6).

In general, dipstick urinalysis may be considered a dependable technique for finding of diabetes mellitus and (UTI) (5). Although, many researchers think that dipstick urinalysis is a dependable investigative test in emergency compared with microscopical examination of urine, and that 18% reduction in microscopically examined and cultured urines may be found if dipstick program is used (7). The aim of this study was to determine the abnormal urine components in k9 dogs.

Materials and Methods

This study involved examination of 135 urine samples of asymptomatic German Shepherd dogs (65 males and 70 females), 2-8 years in units of k9 (Police dogs are specifically trained to assist police in searching for bomb, weapon, explosives and drugs) in Al-Najaf governorate between February 2016 - April 2016. Samples were collected in the morning, before the dogs had consumed food or water. Urine samples were collected into a sterile container by voluntary urination using digital compression of the bladder, according to (8), and then tested by the dipstick strips. The dipsticks adopted contain ten reagents: Protein, pH, glucose, ketones, bilirubin,

urobilinogen, blood, nitrites, specific gravity and leukocyte (Test strips for urinalysis; SD urocolor, ingbert, Germany). Each one dipstick strip, was soaked into urine, reacts with the urine substance and color will changes after (60-120 seconds). Finally, the color of the strip then compared with colors of the kit standard. Urinalysis was recorded abnormal if the constituents were found in urine with high levels than normal according to (9).

The Chi-square test was achieved to compare between percentages of the study results by using SPSS software (IBM SPSS statistics 20).

Results and Discussion

Table (1) illustrates the abnormal urinalysis results of 135 urine samples tested by dipstick, 89 (65.9%) gave negative result for all tests and 46(34%) were positive for some tests. Decreased specific gravity was diagnosed in 2(1.4%) sample, proteinuria in 4(2.9%) samples, bilirubinuria in 2(1.4%) samples, hematuria in 28 (20.4%). Furthermore, nitrituria were detected in 10(7.4%) samples. Glucose, pH, ketone, urobilinogen and

leukocyte did not show abnormality in urine samples. There were no previous dipstick urine analysis researches among asymptomatic k9 dogs in Al-Najaf governorate, so the current results detected hematuria, nitrituria, proteinuria and bilirubinuria in k9 dogs. At first glance, the common abnormality found in K9 dogs was hematuria, so a positive test indicates trauma to any of the urinary organs. A tumor or kidney stone very serious and may be consequence of hematuria (10). Furthermore, there are numerous diseases of the kidney and urinary tract; medications and exhausting exercises that can cause hematuria, in brief, hematuria was a common finding in dogs. Classifying the source can be difficult due to the variety of causes such as sample collection technique and disorders that produce marked morbidity (11). In addition, many authors considered voided urine samples may normally have 0-8 RBCs/ HPF, cystocentesis samples may normally have 0-3 RBCs/ HPF and catheterized samples may normally have 0-5 RBCs/ HPF (12).

Table, 1: Abnormal urinalysis results in both genders.

		Test					Total
		Specific gravity	Bilirubinuria	Hematuria	Proteinuria	Nitrituria	
Male	No.	0	0	9	1	2	12
	%	0.0%	0.0%	75.0%	8.3%	16.7%	100.0%
Female	No.	2	2	19	3	8	34
	%	5.9%	5.9%	55.9%	8.8%	23.5%	100.0%
Total	No.	2	2	28	4	10	46
	%	4.3%	4.3%	60.9%	8.7%	21.7%	100.0%

Non significant result ($P \geq 0.05$) due to calculated Chi- square (2.139) less than the table Chi- square (9.49).

Hematuria due to the exercise may represent a rare subdivision of trauma that is identified by observing a history of vigorous exercise that occurred within minutes to a few days before blood became apparent in the urine and exclude other causes of hematuria (13). In some cases, hematuria may be non-traumatic and happen as a result of increased glomerular excretion of red blood corpuscles into the urine (14 and 15). Another positive finding was proteinuria which is considered as an indicator to end stage of renal diseases. For that reason, asymptomatic proteinuria permits additional checkup to detect and prevent of end stage renal disease (16). Moreover, proteinuria indicates loss of protein, which is a

secondary cause in numerous types of renal disorder (17). Also, the presence of protein in urine may possibly be predisposing factor for urolithiasis as urinary stones is composed of two thirds of the matrix from proteins (18). The leakage of protein in renal diseases, cardiac insufficiency, urinary tract infections and hematuria, are considered pathological causes of proteinuria; and consequently, the inflammatory response of many diseases can contribute to proteinuria due to a glomerulonephritis (4). As a result, detection of micro protein in urine is considered to be a primary warning of renal disorders (19). There are many diseases as cardiovascular diseases, urogenital disease, dental diseases,

respiratory diseases, pyoderma, inflammatory disease, hyperthyroidism, hyperadrenocortism, diabetes mellitus, infectious diseases and neoplasia associated with micro albuminuria (20). Also, another positive finding was nitrituria, there was dependable test for UTI because urinary nitrites are formed by dietary nitrates with the aid of bacterial breakdown, for that reason, the test is specific for infections of the urinary tract (21). The most positive findings of nitrituria were more common in bitches compared with males dogs in our screening. In fact, the short urethra of bitches which predisposes them to ascending bacterial infection, for that reason, the nitrites are formed by bacteria, consequently, the higher nitrites level in female dogs could be sign to high burden of bacteria in urine (22).

Specific gravity (SG) is another valuable test to estimate the density of urine and the solute concentrate; kidneys concentrating ability is affected in renal tubular diseases, the range of SG in normal dogs is 1.015-1.040 and it decreases for many causes such as osmotic diuresis as a result of diabetes mellitus or renal glucosuria, resistance and defect in antidiuretic hormone, hypoadrenocorticism, vigorous fluid therapy in prolong time, and renal medulla hypertonicity loss which may be caused by liver disease (23). Urine of dogs bilirubin when increases up to (+1) refers to bilirubinuria which may be caused by leptospirosis, and hepatic necrosis as a result of infectious canine hepatitis and hemolytic diseases (24).

We concluded that the screening urinalysis almost gave primary ideas and indicators of unknown abnormality; therefore, the positive cases should be retested with other confirmative test to make the precise disease diagnosis to know the animal cases prognosis and enable us to provide patients with early treatment and thereby will enhance the likelihoods of recovery.

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تحليل عينات البول للكلاب البوليسية السليمة ظاهرياً باستعمال أشرطة التحليل

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الخلاصة

تهدف الدراسة لتحديد مدى وجود خلل في بول كلاب الشرطة بقياس كريات الدم الحمر، البروتين، البيليروبين النايتريت، والكثافة النوعية، الكلوكوز، تركيز الاس الهيدروجيني، الأجسام الكيتونية، اليوروبالينوجين وكريات الدم البيض لبول تلك الكلاب. أجريت الدراسة على 135 من الكلاب الخالية من أعراض ظاهرية (65 من الذكور و 70 من الإناث) وتتراوح أعمارها من (2 - 8 سنوات) في محافظة النجف ما بين شهر شباط 2016 ونيسان 2016. جمعت عينات البول من الكلاب في أول الصباح وفحصت العينات باستعمال الأشرطة الغميسة. إن المسح الكامل للبول مفيد في تحديد أمراض الكلى في الكلاب التي لا تظهر عليها العلامات السريرية، كما ان تحليل البول يوفر المعلومات ليس فقط عن الكلية والمثانة، بل الكبد والبنكرياس وغيرها من الأعضاء فضلاً عن إنه يساعد في تشخيص وتوقع شدة المرض والاستجابة للعلاج. أظهرت نتائج المسح للبول ان 46 (34%) من الكلاب غير طبيعية من بين جميع الكلاب، البيلة الدموية كانت الحالة غير الطبيعية الأكثر شيوعاً وظهرت 28 (60%) من الحالات الغير طبيعية، تليها النتريت يوريا 10 (21.7%)، بروتين يوريا 4 (8.7%)، بليروبين يوريا 2 (4.3%) وانخفاض الكثافة النوعية 2 (4.3%) زيادة في الكلوكوز 0 (%)، تغير الاس الهيدروجيني 0 (%)، الاجسام الكيتونية 0 (%)، اليوروبالينوجين 0 (%) وكريات الدم البيض 0 (%).

الكلمات المفتاحية: الأشرطة الغميسة، الكلاب البوليسية k9، المسح لتحليل البول.