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Dr. Aswathanarayanappa V
Assistant Professor, Department of VGO, Veterinary College, KVAFSU, Hassan, Karnataka, India

Dr. Kamal Hasan
Assistant Professor (Job Contract), Department of TVCC, Veterinary College, KVAFSU, Hassan, Karnataka, India

Dr. Shankaregowda
Assistant professor and Head, Department of Veterinary Gynaecology and Obstertrics, Veterinary College, KVAFSU, Hassan, Karnataka, India

Dr. Shivakumar V
Assistant Professor, Department of Veterinary Medicine, Veterinary College, KVAFSU, Hassan, Karnataka, India

Dr. Vismitha V
Post Graduate Student, Veterinary College, Mannuthy, KVASU, Karnataka, India

Corresponding Author:
Dr. Aswathanarayanappa V
Assistant Professor, Department of VGO, Veterinary College, KVAFSU, Hassan, Karnataka, India

Haematobiochemical alterations in Canine Leptospirosis in Hassan: Retrospective study

Dr. Aswathanarayanappa V, Dr. Kamal Hasan, Dr. Shankaregowda, Dr. Shivakumar V and Dr. Vismitha V

Abstract
Leptospirosis is a zoonotic re-emerging disease and is probably the most widespread zoonotic disease in the world. A retrospective study of data from clinical records of veterinary college hospital was undertaken to determine the haematological and biochemical alterations in leptospirosis disease in Hassan from 2017 to 2018. A total of 30 dogs infected with canine leptospirosis presented in Small Animal Clinics of Veterinary college hospital were diagnosed by Dark field microscopy in a period of one year. The commonly observed clinical signs in affected dogs were lethargy, inappettance, vomition and polyuria. Major alteration in haematological profile were overall lower levels of haemoglobin (6.1 ± 2.0 g/dl), TLC (30.7 ± 1.9 x 10^6 /mm3), PCV (18.7 ± 0.5 %) values and platelet count (199.3 ± 6.3 x 10^3 /µL) in German shepherd dog.

Keywords: Leptospirosis, haemato-biochemical, vaccinated and unvaccinated dogs

Introduction
Leptospirosis is a zoonotic infection caused by spirochetes of the genus Leptospira, which according to genetically based classification has 19 species [1]. Leptospirosis is a major public health concern, particularly in developing countries with limited economic resources. It is a re-emerging disease in both dogs and humans and is probably the most widespread zoonotic disease in the world [2]. It is a neglected zoonotic disease with worldwide distribution and more than 300 serovars of Leptospira have been identified and are usually maintained in domestic and wild animal reservoirs, and this represents a persistent source of infection to livestock and humans cohabiting with them [5]. The clinical signs in affected dogs were inappettance, vomition, polyuria and Icteric mucus membrane. Leptospirosis constitutes a significant financial constraint derived from human health cost and livestock production losses. Humans are accidental host and are infected by contact with an environment contaminated by urine of shedder hosts such as rodent, cattle and dog. The Present article gives an alarming information of haematological and biochemical alterations in 30 dogs affected with canine leptospirosis were investigated.

Materials and Methods
The Present study is a retrospective review of records of leptospirosis cases diagnosed from diagnostic lab, Veterinary College Hospital, from 2017-18 of one-year period. A total of 30 dogs (In a period of one year) infected with canine leptospirosis presented in Small Animal Clinics of Veterinary College Hospital, Hassan were diagnosed by Dark field microscopy. Haematology and Serum biochemistry were analysed from clinical samples. Complete history of the animal including age, breed, duration of illness, previous treatment if any, vaccination status and deworming status were recorded.

Results and Discussion
The Mean ± SE values of various haemato-biochemical parameters in animals of Leptospirosis are presented in Table no. 1. In the present study showed decreased levels of Haemoglobin, increased TLC and icteric mucus membrane in affected animals (Fig.1 and Fig.2). Anaemia is usually either mild and non-regenerative, or regenerative and caused by blood loss via the gastrointestinal, urinary or respiratory tracts due to coagulopathy or vasculitis [4]. Increased Leukocyte count observed because of leptospira bacterial infection.

Table 1: Hematological and biochemical findings (Mean ±S.E) in canine leptospirosis (n=30)

Parameters	Units	Patient data		Reference Range*
		Mean ± SE	Observation Range	
Hb	g/dl	6.1±0.20	3.9-8.4	12-18
RBC	$\times 10^6/\mu l$	3.14±0.09	1.95-4.2	5.5-8.8
PCV	percent	18.76±0.58	11.7-25.2	37-55
Platelets	$\times 10^3/\mu l$	199.3±6.09	149-265	200-500
WBC	$\times 10^3/\mu l$	30.7±1.19	19-39.8	6-17
Creatinine	mg/dl	2.57±0.11	1.2-4.0	0.5-1.4
SGPT	IU/L	58.07±3.86	23-98	10-94

All the thirty dogs showed high concentrations of creatinine, suggesting renal failure in canine leptospirosis. In recent years' acute renal failure, which is due to leptospira serovars other than Canicola and icterohaemorrhagea seems to represent the most important clinical manifestations in both vaccinated and unvaccinated dogs against leptospirosis [7]. Increased creatinine level in renal failure might be due to marked reduction in glomerular filtration rate (GFR), diminished renal excretion, enhanced tubular absorption of urea and impaired ability of kidneys to excrete proteinaceous catabolites [3].

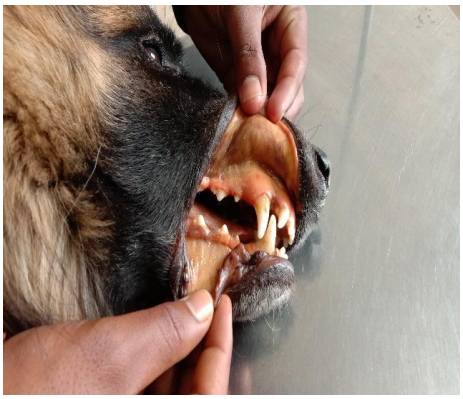

Fig 1: Icteric Oral mucus membrane

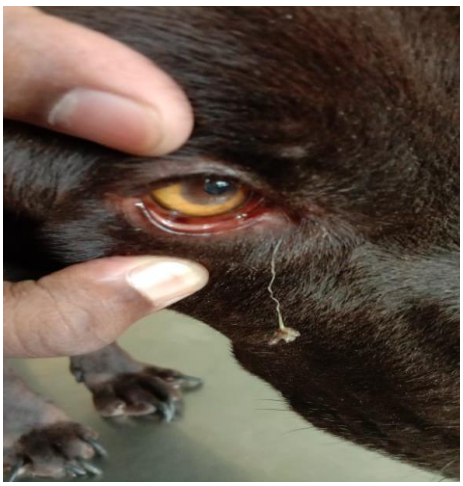

Fig 2: Icteric Conjunctival mucus membrane

In the Present study, higher level of SGPT is due to changes in liver leads to focal necrosis, cellular infiltration with jaundice. The changes are attributable to leptospira toxin, there is production of lipase by the organism which help in release of fatty-acids which inturn induce haemolytic, cytotoxic reaction [6]. The haemotoxin from pathogen causes breakdown of erythrocytes that is intravascular haemolyis, haemoglobinuria and jaundice.

Ethical matters

In the present study, the urine samples were collected from the clinical cases presented to the veterinary hospital, Hassan, indicating no ethical issue related in this study.

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Conflict of interest

All the authors declares that they have no conflict of interest.

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