

## MIXED INFECTION OF LEPTOSPIRA AND *EHRLICHIA CANIS* IN A LABRADOR RETRIEVER DOG- A CASE REPORT

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### SUMMARY

A 3-year-old Labrador Retriever dog was presented to Referral Veterinary Polyclinic, IVRI with anorexia, recumbency, vomiting, weakness and dark yellow coloured urine since last 4 days. Clinical examination revealed hepatic involvement with icteric changes in oral and conjunctival mucous membrane, normal temperature (101.3° F), popliteal lymphadenopathy and tick infestation. Hematobiochemical examination showed anaemia, neutrophilia, hyperbilirubinemia, increased ALP (Alkaline phosphatase) and SGPT (Serum glutamate pyruvate transaminase) levels. It was also found positive for leptospirosis by LAT (Latex agglutination test) and MAT (Microscopic agglutination test). Giemsa stained blood smear revealed morula in monocytes. The dog was treated with amoxicillin-dicloxacillin and doxycycline combination and other supportive therapy. After the course of therapy, the dog was apparently healthy and laboratory investigation revealed negative for both *Leptospira* and *E. canis*.

**Key words:** Dog, *Ehrlichia canis*, LAT, Leptospirosis, MAT

Leptospirosis is one of the most prevalent zoonotic diseases in the world involving rodents as the most important reservoir host. It is the major source of infection to humans (Kahn, 2010). Dogs may be presented with either hepatic involvement or renal involvement. Icteric changes will be seen as a result of hepatic failure (Sykes *et al.*, 2011). The definitive diagnosis is mostly based on microscopic agglutination test (MAT) which is considered as the gold standard test (Levett, 2001). Dark field microscopy, fluorescent staining of the antibody in urine and latex agglutination test (LAT) can also be used for diagnosis. Conventional treatment for leptospirosis includes Benzyl penicillin which is found to be useful in leptospiremic phase at 40,000 IU/Kg B.wt (Craig *et al.*, 2012). Doxycycline @ 5-10 mg/Kg B.wt was found to be effective in both leptospiremic and leptospiruric stage (McClain *et al.*, 1984).

Canine monocytotropic ehrlichiosis (CME) is a tick borne rickettsial disease caused by *Ehrlichia canis*. This obligate intracellular pathogen is transmitted by the brown dog tick (*Rhipicephalus sanguineus*). Clinical signs of ehrlichiosis include fever, weakness, anorexia, lymphadenomegaly, hepatomegaly, splenomegaly, weight loss, oedema in dependent parts, pale mucous membranes due to anaemia and bleeding associated with thrombocytopenia (Das and Konar, 2013). Direct screening of peripheral blood smear for the presence of *E. canis* morula in monocytes, which can be detected only in acute phase, is the routine diagnostic test (Nakaghi *et al.*, 2008). Morulae could be observed in blood smear in only few clinical cases, so PCR diagnosis can be used for early detection (Kahn, 2010). Doxycycline at 5 mg/kg twice daily or 10 mg/kg once daily for upto 3-4 weeks is found to be effective in eliminating parasitemia (Breitschwerdt *et al.*, 1998).

A three-year-old male Labrador Retriever dog was presented to Referral Veterinary Polyclinic (RVP)-IVRI with history of anorexia, vomiting, recumbency, weakness and voiding of dark yellow urine since last 4 days. Owner reported tick infestation also. Clinical observations revealed icteric oral and conjunctival mucous membrane, popliteal lymphadenopathy, rectal temperature of 101.3°F, heart rate of 70 bpm and respiration rate was 18/min. Animal evinced severe pain upon palpation of abdomen. Blood and serum samples were collected for complete blood count and serum biochemistry, respectively (Table 1).

The blood picture of the affected dog showed acanthocytes (spiked RBCs) (Fig. 2) which are relatively common in severe liver dysfunction and malnutrition. In Giemsa stained peripheral blood smear, mulberry shaped morula was observed inside monocytes suggestive of *E. canis* infection (Fig.1). Serum samples were positive for

**Table 1**  
**Haemato-biochemical changes in the affected dog**

Parameter	Observed values	Reference values	Key findings
RBC count (millions per mm <sup>3</sup> )	3.74	5-7.9	Anaemia
Haemoglobin (g/dl)	9	12-19	
Total WBC count (cells/mm <sup>3</sup> )	10.3	5-14.1	
Neutrophil (%)	72	58-85	
Lymphocyte (%)	26	8-21	Lymphocytosis
Monocyte (%)	02	0-7	
Alkaline phosphatase (IU/L)	295	3-65	Hepatic injury
SGPT (IU/L)	114	10-109	
Total bilirubin (mg/dl)	5.7	0-0.3	

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\*March 2012: Reference ranges, 10th edn. The Merck veterinary Manual

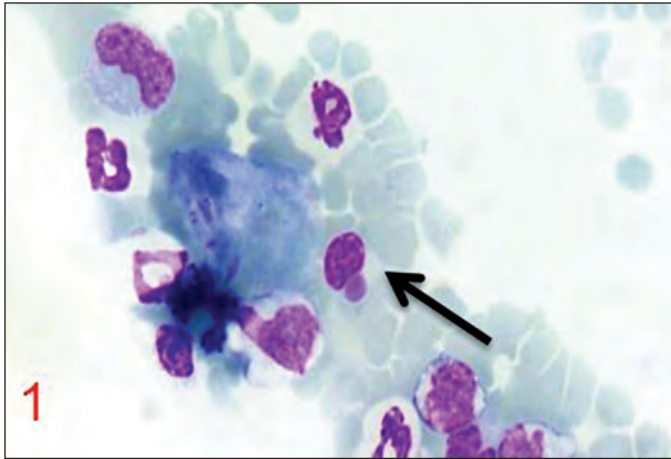


Fig. 1. *E. canis*

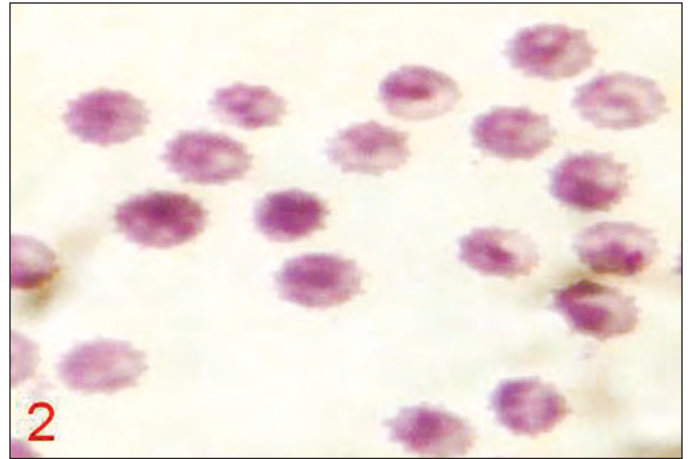


Fig. 2. Acanthocytes

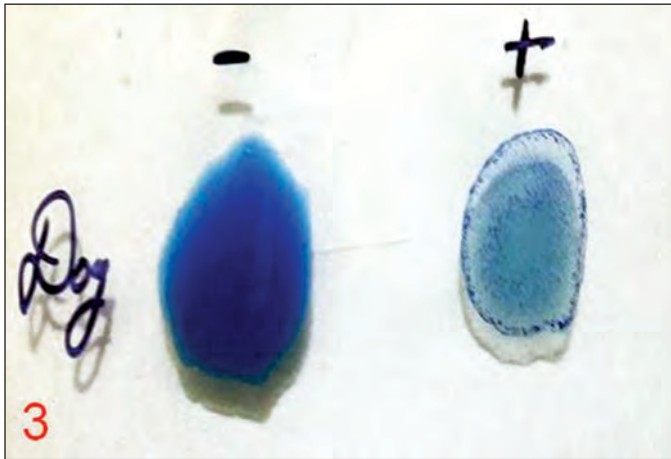


Fig. 3. Positive Latex Agglutination Test



Fig. 4. Positive Microscopic Agglutination Test

leptospirosis by LAT and MAT (Fig. 3 & 4).

The dog was treated with Amoxicillin and Dicloxacillin (@ 20 mg/kg B. wt BID IV for 7 days) and Tab. Doxycycline (@5mg/kg B.wt. BID PO for 21 days. Dog was also treated with antioxidants (ascorbic acid @ 20mg/Kg OD PO for 21 days), Hepatoprotectants and steroids (Prednisolone acetate 1mg/kg B. wt OD PO for two weeks followed by tapering dose for next one week). The dog recovered after the course of treatment. The owner was advised not to touch the secretion and excretion of dog due to zoonotic potential.

### CONCLUSION

A case of mixed infection with *Leptospira* and *E.canis* was diagnosed in a dog and treated successfully with specific and symptomatic therapy.

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