Case Report

SUCCESSFUL MANAGEMENT OF LEPTOSPIROSIS IN A DOG – A CASE REPORT

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ABSTRACT

A seven year old intact non-descript male dog was brought to the Madras Veterinary College Small Animal Unit with a history of reduced appetite, vomiting and voiding of dark yellowish urine for the past three days. On physical examination, he had pyrexia, icteric mucous membrane and enlarged lymph nodes. Haemato-biochemistry analysis revealed anaemia with neutrophilia, elevated creatinine, direct and total bilirubin. He was diagnosed as Leptospira interrogans by using ELISA and the serovar was confirmed as Leptospira interrogans var. canicola using Microscopic Agglutination Test (MAT). He had uneventful recovery after being treated with Doxycycline orally for 21 days along with supportive therapy.

Keywords: Canine, Doxycycline, Leptospira, Microscopic agglutination test.

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Leptospirosis, a zoonotic disease of worldwide significance that affects many animal species, is caused by infection with leptospiral spirochaetes of the species *Leptospira interrogans* that includes more than 250 serovars (Greene, 2006). The prevalence of Leptospira antibodies among dogs in India is 19.7% (Patil *et al.*, 2014). Highest rate of infection occur during October to November which coincides with the monsoon season. Serovars *icterohaemorrhagiae, canicola and grippotyphosa* are reported to be the most common Leptospira isolated from dogs with clinical signs of leptospirosis (Greene, 2006).

The primary source of disease is urine excreted from the infected animals and the transmission can either be direct or indirect. The present case reports a Leptospirosis in a dog and its medical management.

Seven year old intact non-descript male dog was brought to the Madras

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Veterinary College Small Animal Unit with the history of reduced appetite, regurgitation of the food and voiding of dark yellowish urine for the past three days. On detailed clinical examination, he had pyrexia (39.6°C), icteric mucous membrane. Hepatomegaly was detected by abdominal palpation. He was subjected to complete blood count analysis and Microscopic Agglutination Test for further diagnosis.

The results revealed anaemic (Hb- 7.2 g/dl, PCV- 22.8%, RBC- 4 lakh cells/µl) with normal platelet count (4,64,000/µl). The white blood cell count was elevated (24,200 cells/µl) with neutrophilia (82%). The serum biochemistry values showed a rise in creatinine (1.62 mg/dl), ALT (282 U/L), direct bilirubin (0.34 mg/dl) and total bilirubin (1.45 mg/dl). Solid phase immunoassay (ELISA) revealed that he was positive for IgG antibodies against *Leptospira interrogans* indicating the chronic nature of the disease. The serogroup was confirmed as *Leptospira interrogans var canicola* by using Microscopic Agglutination Test (MAT) with the titer value of 1:100. The serovars used as antigen for MAT were *L. canicola, L. icterohaemorrhagia, L. grippotyphosa*. The serovars were procured from the Leptospira diagnostic laboratory, Centre for Animal Health Studies at Madhavaram, Tamil Nadu Veterinary and Animal Sciences University, Chennai.

He was treated initially with Inj. Amoxicillin and cloxacillin @ 10 mg/kg IV bid for five days followed by Tab. Doxycycline @ 10 mg/kg sid orally for 21 days along with Pantoprazole, hematinic, liver supportive S-Adenosyl methionine and silybin combination for 10 days. Blood samples were repeated after 10 days and 21 days post- treatment (Table I and II). After 21 days, he was quite active with all his normal behavior indicating complete recovery without developing any further complications.

Diagnosis of Leptospira was confirmed with Microagglutination test. But MAT couldn't distinguish Leptospira antibodies caused by natural infection or vaccination. Paired sera samples were used to confirm Leptospira infection with MAT (Scanziani *et al.*, 2002). A titre of 1:80 and above was considered positive in case of human and other animals except rat. In rats, a titre value of 1:20 and above is considered positive (Babu, 2014).

Supplementary methods were used in the diagnosis of leptospirosis include dark field microscopy, bacteriologic culture, and fluorescent antibody testing (Mauro and Harkin, 2019). These tests had good specificity but poor sensitivity (Greene, 1990). The PCR test had a sensitivity of 100% and a specificity of 88.3% for leptospirosis (Mauro and Harkin, 2019). This technique had proved to be valuable in the detection of chronic urinary shedding of leptospires in clinically healthy dogs (Rojas *et al.*, 2010). Specific Leptospira IgM and IgG antibodies were detected by using Enzyme Linked Immunosorbent Assay (ELISA) (Goldstein, 2010).

Table I. Comparison of haematological parameters

Parameters	Reference value	Before -treatment	10 days post - treatment	21 days post – treatment
Hb (g/dl)	(11.9-18.9)	7.2	8.5	10.6
PCV (%)	(24-46)	22.8	23.1	25
RBC (lakhs/µl)	(5-8)	4	4.27	5.25
WBC(1000/µl)	(5-14)	24,200	19,700	15,200
Platelet (lakhs/µl)	(2.1-6.2)	4,64,000	5,11,000	6,10,000
Neutrophil	(8-85)	82	80	70
Lymphocyte	(8-21)	12	14	28
Monocyte	(2-10)	4	3	1
Eosinophil	(0-9)	2	3	1

Table II. Comparison of biochemical parameters

Parameters	Reference value	Before treatment	10 days post -treatment	21 days post – treatment
BUN (mg/dl)	(8-28)	9.2	10.25	13
Creatinine (mg/dl)	(0.5-1.6)	1.64	0.77	0.8
ALT (U/L)	(10-109)	282.0	150.0	108
Calcium (mg/dl)	(8-12)	9.78	10.43	10.62
Phosphorus (mg/dl)	(4-6)	5.6	6.64	5.9
Total protein (g/dl)	(5.4-7.5)	6.9	5.9	7.1
Albumin (g/dl)	(2.3-3.1)	2.6	3.1	3.2
T.Bilirubin (mg/dl)	(0-0.3)	1.45	0.96	0.25
D.Bilirubin (mg/dl)	(0-0.6)	0.34	0.11	0.2

Traditionally, Penicillin or doxycycline had been the antimicrobials of choice for treatment of humans and dogs with leptospirosis. If vomiting or other adverse reactions preclude doxycycline administration, dogs with leptospirosis should be treated with ampicillin, 20 mg/kg IV q6h, with dose reduction for azotemic dogs. Dogs should receive doxycycline at 5 mg/kg PO or IV for 2 weeks after gastrointestinal signs abate in order to eliminate organisms from the renal tubules. Leptospirosis in domestic animals can be controlled through vaccination with inactivated whole cells or an outer membrane preparation (Raghavan *et al.,* 2002).

Increased numbers of infectious diseases were more likely to occur as a result of lack of early diagnosis and appropriate treatment. In this case, *L. interrogans var canicola* was diagnosed by using MAT and

after vigorous treatment, the dog had an uneventful recovery.

REFERENCE

Babu, L.S. (2014). Isolation and serological evidences in suspected leptospirosis cases in and around Chennai. *American Journal of Clinical and Experimental Medicine*, **2**(4):70-73.

Goldstein, E. (2010). Canine Leptospirosis. *Veterinary Clinics Small Animal Practise,* **40:** 1091–1101.

Greene, C.E. (1990). Infectious diseases of the dog and cat, 1st edn. WB Saunders. Philadelphia.

Greene, C.E. (2006). Infectious diseases of the dog and cat, 3rd edn. WB Saunders, Philadelphia.

Mauro, T. and Harkin, K. (2019). Persistent Leptospiruria in five dogs despite Antimicrobial Treatment. *Journal of the American Animal Hospital Association,* **55** (1):42–47**.**

Patil, D., Dahake, R., Roy, S., Mukherjee, S., Chowdhary, A. and Desmukh, R. (2014). Prevalence of leptospirosis among dogs and rodents and their possible role in human leptospirosis from Mumbai, India. *Indian Journal of Medical Microbiology*, **32:**64-67.

Rojas, P., Monahan, A.M., Schuller, S., Miller, I.S., Markey, B.K. and Nally, J.E. (2010). Detection and quantification of leptospires in urine of dogs: a maintenance host for the zoonotic disease leptospirosis. *European Journal of Clinical Microbiology and Infectious Disease,* **29**(10):1305–1309.

Scanziani, E., Origgi, F., Giusti, A.M., Iacchia, G., Vasino, A., Pirovano, G., Scarpa, S. and Tagliabue, S. (2002). Serological survey of leptospiral infection in kennelled dogs in Italy. *Journal of Small Animal Practice,* **43:**154-157.