Acute Leptospirosis in Dog- A case report

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Citation

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Abstract

An eight year old of female ND (Non-descriptive breed) dog with fever, vomiting, anorexic and depressed condition was monitored over 7 days till death. Icterus was common in the affected dog and increased liver enzyme activity and BUN and creatinine clearly showed the hepatic and renal dysfunction. Postmortem findings showed icteric, mottled liver and necrotic kidney. The antibody titer was 1:200 at the 5th day for the Leptospira microscopic agglutination test confirm the acute phase of infection.

INTRODUCTION

Leptospirosis is a sporadic bacterial zoonotic disease caused spirochetes of the genus Leptospira that affects humans and wide range of animals. This disease continues to have a major impact on people living in urban and rural areas of developing countries with a high level of morbidity and mortality. Leptospirosis is transmitted by the urine of an infected animal and is contagious as long as it is still moist. Leptospiral infections cause both acute and chronic disease and the severity of infections are related to the virulence of the organism, susceptibility of the host, and the affected host species (Radostits, et. al., 2000). Several antigenically distinct serovars of L. interrogans sensu lato are responsible for disease in dogs. The serovars most commonly incriminated in canine infection and their common reservoirs include L. canicola (dog), L. icterohaemorrhagiae (rodents), L. grippotyphosa (raccoon, skunk, opossum, vole), L. pomona (cattle, swine, skunks, opossum), and L. bratislava (rodents, swine) (Greene, 1998). There are four forms of leptospirosis infection in dogs such as peracute, subacute, acute and chronic. Pyrexia (103-104°F), shivering, and generalized muscle tenderness are the first clinical signs in acute leptospirosis followed by vomiting, rapid dehydration, and peripheral vascular collapse subsequently (Greene, 1998). Leptospira generally target adult animals ranging from one to six years of age. In dogs, the incubation period (time from exposure to signs of clinical disease) varies between 3 and 20 days; the most common signs of disease are anorexia, lethargy, vomiting, fever, weight loss, increased drinking and urinating (polydipsia/polyuria), diarrhea, abdominal/lumbar pain, icterus/jaundice, stiffness/reluctance to walk (myalgia), enlarged kidneys (renomegaly), small areas of hemorrhage (petechia) or sometimes severe hemorrhage, and low platelet count (thrombocytopenia).

Diagnosis may be difficult during the early stages of the disease due to vague symptoms and increase in kidney and liver values having yet to occur. Liver damage is demonstrated by increased serum alanine aminotransferase (ALT), aspartate aminotransferase, lactate dehydrogenase, and alkaline phosphatase (ALP) activities. Bilirubin concentration also is increased, reflecting cholestasis. The increase in serum ALP activity often is proportionally greater than that of ALT activity. Increased serum amylase and lipase activities may result from their release from inflamed hepatic and small intestinal tissues and from decreased renal clearance. Diagnosis of leptospirosis is based on a combination of suggestive historical information, physical findings, nonspecific laboratory findings, and confirmatory testing. Confirmatory tests include serologic testing to detect antibody production to leptospira. Leptospiral infection has been based generally on serologic evidence. A wide variety of serological tests, which show varying degrees of serogroups and serovar specificity, have been described. Two tests have a role in veterinary diagnosis: the microscopic agglutination test (MAT) and enzyme-linked immunosorbent assay (ELISA) (OIE, 2000, Cohn, 2003). Here the study was conducted to reveal the acute phase of leptospirosis infection in dog through clinical sign, serum chemistry, serology and postmortem examination.

MATERIALS AND METHOD

An eight year old female ND (Non-descriptive breed) dog presented with fever, vomiting, anorexia and depression. A physical examination revealed normal lymph nodes, heart rate 70/min, temperature 105°F and yellowish urine. A blood sample was then tested for leptospira antibody titer MAT (Microscopic Agglutination Test) for the confirmation. At the same time, the dog was given antibiotic treatment (Amoxicillin and Cloxacillin combination) and rehydration saline. Over the course of two days, the patient's physical condition deteriorated: with a subnormal temperature (98°F), a noticeable increase in thirst, difficulty breathing, muscular tremors, frequent urination and subsequent dehydration and died on 7th days after the onset of clinical signs. Immediately a necropsy was performed to examine pathological changes.

RESULT

BIOCHEMICAL PROFILE

Figure 1

Indices	Laboratory result	unit	Reference interval
Total protein	6.8	g/dl	5.2-7.3
ALT	**1254 H**	U/L	12-108
ALP	**4642 H**	U/L	13-122
glucose	88	mg/dl	77-120
Total billirubin	**8.8 H**	mg/dl	0.0-0.2
cholesterol	**1507 H**	mg/dl	129-264
Calcium	10.7	mg/dl	9.3-11.4
Phosphorus	4.5	mg/dl	3.2-5.4
BUN	**225 H**	mg/dl	20-25
Creatinine	**11.5 H**	mg/dl	1.0-2.0

*H- Higher than normal level

SEROLOGY

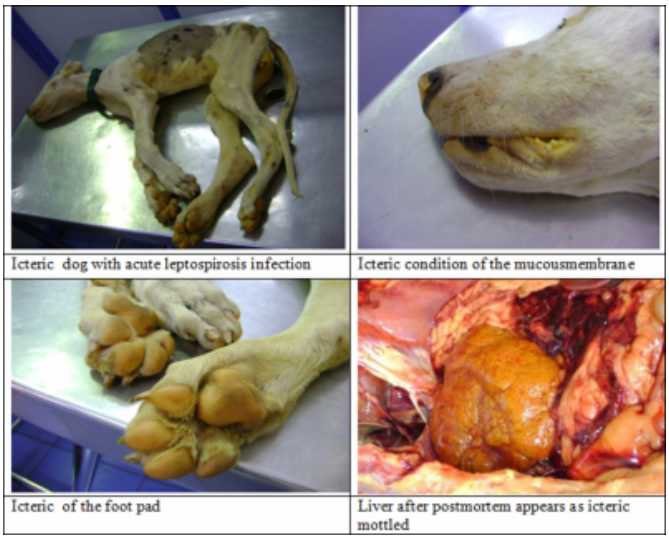
Agglutination test (MAT) was performed in acute stage (day 5 of the onset of clinical sign) and the titer was found as 1: 200.

POSTMORTEM FINDINGS

- Liver-hepatitis, focal mottled appearance, necrosis and yellow appearance.
- Kidney- Necrosis.
- Cardiovascular-endothelial cell damage, hemorrhage.

Figure 2

Fig: clinical and postmortem findings of acute Leptospirosis



Icteric dog with acute leptospirosis infection | Icteric condition of the mucousmembrane

Icteric of the foot pad | Liver after postmortem appears as icteric mottled

DISCUSSION

The first line of treatment of leptospirosis is to provide the dog with a suitable antibiotic. The penicillin class of antibiotics works well against leptospirosis. In addition to antibiotic therapy, intravenous and subcutaneous fluids are giving to as supportive care (Adin, et. al., 2000).

Both BUN and creatinine were elevated suggesting kidney damage and blood serum chemistry values were consistent with liver damage (elevated ALP, ALT and bilirubin) (McDonough, 2007).

The current "gold standard" diagnostic test for leptospirosis is the Leptospira Microscopic Agglutination Test (L-MAT) performed during the acute stage of disease. In the acute stage of infection the titer is low and then rise in the convalescent sample to 1:800-1:1600 or higher if a homologous Leptospira serovar is tested; in vaccinated animals, expect low (usually not higher than 1:400) titers for the vaccine serovars L. canicola and L. icterohaemorrhagiae, and for other serovars the above information is the same; ideally, all serum samples should be run at the same time (Baldwin, et al., 1987). Generally, a four fold rise in antibody titer to a Leptospira serovar is considered significant. When titers to a particular serovar reach high levels, eg, 1:3200 to 1:6400, it is not unusual to see elevated titers to other serovars, which is likely due to cross reactions. Antimicrobial treatment adversely affects the development of antibody titer (McDonough, 2007).

The postmortem findings were consistent with a leptospirosis infection. Lesions were found throughout liver

which was mottled in appearance. In an acute infection the liver is affected most severely (Greene, 1998).

CONCLUSION

In the past decade, leptospirosis has emerged as a globally important infectious zoonotic disease. It occurs in urban and rural environments in both industrialized and developing countries throughout the world. Humans are infected from carrier animals, primarily feral and peri-domestic rodents, especially rats, and domestic farm animals (dogs, pigs and cattle). Transmission occurs from occupational or recreational immersion in contaminated water or by direct contact with carrier animals. Leptospirosis is an infectious disease which infects not only dogs, but other mammals as well. People can be infected with leptospirosis, causing potentially life-threatening illness, making leptospirosis a particularly dangerous zoonotic disease.

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