Clinical Diagnosis and Treatment of Leptospirosis in two Dogs

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ABSTRACT

Leptospirosis is a common disease of livestock, pet animals and wildlife throughout the world. Two dogs aged between 3-4 years were presented to the clinic with a history of fever (104.4°F), progressive anorexia with vomiting, polyuria and discolored urine. Upon clinical examination, all oral mucous membranes and the skin surfaces of ventral abdominal side were icteric. Urine and blood samples were collected and send to the laboratory for diagnosis. Dark field microscopic examination revealed the presence of leptospiiral organisms in urine sample. Microscopic agglutination test is used to determine the presence of antibodies against leptospira organisms. Streptomycin-penicillin and doxycycline along with supportive therapy were used in dogs for 15 days, and they made a full recovery from disease. The present case reports focuses on early detection of leptospirosis and timely therapeutic intervention.

Keywords: Leptospirosis, icterus, Microscopic Agglutination Test (MAT), Streptomycin, Penicillin, Doxycycline, microscopy.

INTRODUCTION

Leptospirosis is a sporadic bacterial zoonotic disease caused by spirochetes of the genus Leptospira that affects humans and wide range of animals (Rojas et al., 2010). 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. It has a significant clinical presence in canine medicine. In addition to an increased number of cases, more diverse clinical presentations are being recognized (Ananda et al., 2008). 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 (Radostitis et al., 2007).

There are four clinical 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 et al., 1998).

Case presentation

Two dogs (Dog 1 – Spitz, Male, 3 years and Dog 2 – Spitz, Female, 4 years) were presented to the clinic on lateral recumbency with the symptoms of high fever, anorexia, vomiting, polyuria and deep yellow colored urine (Fig. 1). Upon clinical examination, all oral mucous membranes (Fig. 2) and skin surfaces at ventral side of the abdomen (Fig. 3) were icteric. On physical examination high temperature (104.1°F in Dog 1 and 104.4°F in Dog 2), increased respiration (46 breaths/min) and pulse rate (126/min), icteric conjunctival mucous membranes (Fig. 4) were observed. Blood sample was collected from peripheral vein and sent to labrotory for microscopic agglutination test to determine the antibody titer of leptospirosis. Urine sample was collected by passing catheter in both the dogs and tested for presence of leptospira organisms under dark field microscope. Whole blood and serum were collected for hemato-biochemical analysis. Haematological analysis of blood revealed low levels of Hb, PCV, TEC, more no. of leukocytes and neutrophils. Increased levels of ALT, AST, BUN and creatinine levels were observed (Table 1). On ultrasonography hepatomegaly, distended gall bladder and enlarged kidneys were recorded. Microscopic Agglutination Test (MAT) was done on 5th day of onset of clinical signs and the titre was 1:800 for L. canicola and 1:400 for L. pomona.

Treatment

Dogs were treated with injections of streptomycin-penicillin, 25000 IU/kg, bwt, im., flunixine meglumine, 2
hematological findings. Enlarged kidneys on ultrasound
icterohaemorrhagiae and L. Pomona (Shawn Kearns,
essential for the development of renal lesions (Visith
unclear, the presence of leptospires in the renal tissue i s
leptospire migration. Although the actual mechanism is
hepatic involvement and include Leptospira
hemorrhage (petechia) or sometimes severe hemorrhage,
enlarged kidneys (renomegaly), small areas of
polydipsia/polyuria), diarrhea, abdominal/lumbar pain,
signs of disease are anorexia, lethargy, vomiting, fever,
disease) varies between 3 and 20 days; the most common
incubation period (time from exposure to signs of clinical
animals ranging from one to six years of age. In dogs, the
Andre´-Fontaine, 2006). Leptospira generally target adult
This is in accordance with the findings of John
et al., 1980; Chandrasekaran and Pankajalakshmi, 1997 and
mg/kg, bwt, im and fluid therapy (Dextrose Normal
Saline,10ml/kg, bwt. iv) for 5 days followed by
doxycycline, 5 mg/kg, bwt, for 15 days po and silymarin,
10ml, po., bid. Symptomatically antiemetic (emeset, 0.2
mg/kg, bwt, iv) was administered to control emesis. The
owner was warned about the zoonotic importance and
advised to follow strict personnel hygienic measures.

**Table 1: Hematologic and serobiochemical results.**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Parameters</th>
<th>Reference values</th>
<th>Dog 1</th>
<th>Dog 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before therapy</td>
<td>After therapy</td>
<td>Before therapy</td>
</tr>
<tr>
<td>1.</td>
<td>Hb (g/dl)</td>
<td>12 - 15</td>
<td>8.7</td>
<td>10.1</td>
</tr>
<tr>
<td>2.</td>
<td>PCV (%)</td>
<td>35 - 47</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>3.</td>
<td>TEC (10³/µl)</td>
<td>5 - 8</td>
<td>4.89</td>
<td>5.17</td>
</tr>
<tr>
<td>4.</td>
<td>TLC (10³/µl)</td>
<td>6 - 14</td>
<td>15.1</td>
<td>11.02</td>
</tr>
<tr>
<td>5.</td>
<td>Neutrophils (%)</td>
<td>60 - 70</td>
<td>77</td>
<td>68</td>
</tr>
<tr>
<td>6.</td>
<td>Lymphocytes (%)</td>
<td>10 - 30</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>7.</td>
<td>Monocytes (%)</td>
<td>2 - 10</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>Eosinophils (%)</td>
<td>0 - 9</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>Basophils (%)</td>
<td>0 - 1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>ALT (U/L)</td>
<td>21 - 102</td>
<td>127</td>
<td>71</td>
</tr>
<tr>
<td>11.</td>
<td>AST (U/L)</td>
<td>23 - 66</td>
<td>96</td>
<td>52</td>
</tr>
<tr>
<td>12.</td>
<td>BUN (mg/dL)</td>
<td>10 - 28</td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>13.</td>
<td>Creatinine (mg/dL)</td>
<td>0.5 – 1.5</td>
<td>1.8</td>
<td>1.3</td>
</tr>
<tr>
<td>14.</td>
<td>Total protein (mg/dL)</td>
<td>5.4 – 7.1</td>
<td>6.1</td>
<td>6.5</td>
</tr>
<tr>
<td>15.</td>
<td>Total bilirubin (mg/dL)</td>
<td>0.15 – 0.50</td>
<td>1.1</td>
<td>0.7</td>
</tr>
<tr>
<td>16.</td>
<td>Direct bilirubin (mg/dL)</td>
<td>0.06 – 0.12</td>
<td>0.21</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Vijayachari et al., 2001) had proved that dark field
microscopy after differential centrifugation is useful in the
early diagnosis of leptospirosis and thereby could prevent
later complications like jaundice.

For detection of serum leptospiral antibodies, the
microscopic agglutination test (MAT) was preferred.
Identification of the infecting serovar based on the MAT
response early in infection is, however, problematic
because of the paradoxical effects observed in the
serological response to early leptospirosis (Faine et al.,
2000). The first line of treatment of leptospirosis is to
provide the dog with a suitable antibiotic. Penicillin and
their derivatives are the antibiotics of choice in
eliminating leptospiremia, but they do not eliminate the
carrier state (John and Greene, 2004). In addition to
antibiotic therapy, intravenous and subcutaneous fluids
are giving to as supportive care (Adin and Cowgill, 2000).
Brunner and Mayer (Brunner and Meyer, 1950) had
proved that chronic renal infections with leptospira in
hamsters and dogs may be successfully cured with
streptomycin as canine leptospirosis is usually treated
after the parasite has already disappeared from the blood.
Once penicillin therapy has been completed and azotemia
has resolved, other antibiotic classes (i.e., tetracycline,
erythromycin, aminoglycosides, fluoroquinolones) should
be administered to eradicate the carrier state. Doxycycline
(2.5 to 5 mg/kg PO q12h for 2 weeks) is used most
commonly in this situation. Doxycycline can also be used
in the initial leptospiremic phase, assuming the animal can
infect the spread of leptospirosis in endemic areas.

**Conclusion**

In the present case reports, early recognition and
timely administration of appropriate antimicrobials for
leptospirosis yielded good response. Educating the owner
about the zoonotic impact of leptospirosis and awareness
about vaccination helps in preventing the disease. To
avoid human exposure and infection, veterinary personnel
must maintain strict sanitation when managing cases of
canine leptospirosis.
REFERENCES


