

# OCCURRENCE OF INFECTIOUS HEPATITIS WITH ENCEPHALITIS IN A MONGREL DOG

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A semi owned, cross bred, mongrel, male dog aged 5 months was reported in the clinical complex of College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana with a history of inappetence, high fever and severe hemato-emesis but not vaccinated or dewormed earlier being a semi owned dog. Hematological, biochemical and urine examination was conducted suspecting it to be an infectious disease. The ailing dog was administered with symptomatic and supportive treatment which continued for several days. As the dog was refractory to the antibiotic used initially, thus on third day as convulsive episodes were also reported; the treatment protocol was reviewed. The dog started to improve on fourth day onwards and got fully recovered on the sixth day of the change of treatment. On day eleventh the dog was again reported with transient unilateral corneal opacity further tentatively diagnostic to be a case of infectious canine hepatitis.

**Keywords:** Corneal opacity, Dog, Infectious hepatitis, Seizures.

Infectious canine hepatitis (ICH) is a systemic viral disease of young Canidae and Uridae caused by canine adenovirus-1 (CAV-1) characterized clinically by inapparent to rapidly fatal disease (Greene, 2006). Effective vaccination has greatly reduced its incidence although it is re-emerging in some endemic countries causing outbreaks in animal shelters, breeding kennels and pet shops (Decaro *et al.*, 2007).

Canine adenoviruses 1 and 2 cause severe diseases in dogs, foxes, coyotes, and bears, including hepatitis, ocular lesions, interstitial nephritis, encephalopathy, and respiratory tract infections (Kelly, 1993; Koptopoulos and Cornwell, 1981). Canine adenovirus-1 (CAV-1) is both endotheliotropic and hepatotropic i.e. it has affinity for endothelium and hepatocytes resulting in fulminant hepatic necrosis, and CNS disease rarely. In acute hepatitis hemorrhages and disseminated intravascular coagulation, is most commonly observed. In convalescent cases, an ocular reaction that involves antigen-antibody complexes produces corneal edema and anterior uveitis (characteristic "blue eye") (Decaro *et al.*, 2007). Mild, acute and peracute clinical forms of ICH have been described (Stalker and Hayes, 2007). In the peracute form of disease sporadic cases are found dead without any sign of illness or after an illness of few hours

with anorexia and high fever. Mortality due to ICH occurs only in young dogs (under 2 year age) (Akerstedt *et al.*, 2010). It has been reported that ICH is most frequently seen in dogs younger than 1 year, although unvaccinated dogs of all ages can be affected (Greene, 2006).

The present report describes the disease in a mongrel, semi-owned, unvaccinated male dog 5 months of age with clinical signs resembling that of Infectious canine hepatitis such as hematoemesis, abdominal pain, inappetence, high fever, seizures and its successful therapeutic management.

**Case Report:** A brown coloured cross bred mongrel, semi owned male dog aged 5 months was presented to the Veterinary Clinical Complex with a history of inappetence, abdominal pain, hyper-irritability, high fever, dullness, depression and severe hemato-emesis since two days. The dog was never vaccinated or dewormed as it was a semi owned dog. On physical examination the dog was showing severe dehydration, palor mucous membranes, with increased respiratory rate (35 breathes/min), heart rate (110 beats/ min.) and high temperature (104.5 F). Moderate tick infestation with rough hair coat was also noticed. Blood for hematological and

biochemical examination was collected in EDTA vials and serum vials containing clot activator respectively. Urine was simultaneously collected with 8 no. baby feeding tube for routine and culture sensitivity examination. Treatment was initiated with Amoxicillin sulbactam @10 mg/kg b.wt, intramuscular twice daily, antihistaminic i.e. chlorpheranamine maleate @0.5mg/kg b.wt. intramuscular, once a day, antacid i.e. pantaprazole @1.0 mg/kg.b.wt, intravenous, twice a day, antipyretics i.e. analgin@ 2ml intravenous, sos, analgesic, antioxidants, multivitamins, anti emetics i.e. prochlorperazine@0.1mg/kg.b.wt, intramuscular thrice a day, and fluid therapy with NSS or DNS @50ml/kg b.wt, intravenous, twice a day. The dog did not respond to the therapy for two days and on third day of ongoing treatment the clinical condition of the dog get worsened as it was reported to be suffering from restlessness, convulsions and seizures overnight. The treatment protocol was reviewed and the antibiotic was changed to Ceftriaxone - Tazobactam @ 20mg/kg body weight once daily along with anticonvulsant drug diazepam @ 1.0mg/kg. b.wt both intravenous and per-rectally depending upon the severity of seizures along with the earlier administered symptomatic and supportive treatment. The dog was prescribed with acaricidal topical application and inj. Ivermectin @ 0.2mg/kg. body weight, subcutaneously. The owner was advised to administer oral preparation of hepato-protectant to the dog twice daily for two to three months and deworm and vaccinate the dog with commercially available multivalent live attenuated vaccine after recovery.

### Results and Discussion

ICH is characterized by asymptomatic to fatal disease. Canine adenovirus-1 is transmitted by the oro-nasal route and excreted in the urine of carrier animals for up to 6 months. Virus enters the host *via* direct contact with contaminated saliva, urine and faeces (Cabasso, 1981). The incubation period is 4–7 days. The main clinical findings are rhinitis, ataxia, anorexia, tonsillitis,

abdominal pain, blood in faeces, acute/chronic hepatitis and interstitial nephritis (Decaro *et al.* 2007).

The present case of the dog had severe hematoemesis, high fever, abdominal pain, restlessness and convulsions indicative of CAV-1 infection which is supported by history of lack of protective immunity and exposure from other freely ranging dogs. Encephalitis is an infrequent event but when it occurs, death can follow rapidly with lethargy, ataxia, blindness and vomiting (Caudell *et al.*, 2005). Though the dog had severe hematoemesis, lethargy and seizures but he responded to the therapy third day of the treatment after administering the sensitive drug and his life could be very well saved.

Results of the hematology, biochemical and urine examination are depicted in Table 1. On day 1, the blood reports were indicative of Leucocytosis, absolute neutrophilia, thrombocytopenia and anemia. Liver function profile was indicative of highly increased values of SGPT along with hypoproteinemia and albuminemia. Canine adenovirus-1 has affinity for endothelium and hepatocytes, results in fulminant hepatic necrosis. Blood urea nitrogen and creatinine levels were slightly raised. Urine examination depicted albuminuria and pus cells. The microbiological examination of urine confirmed urine tract infection with isolation of *Staphylococcus spp.* sensitive to Ceftriaxone –Tazobactam and resistant to most of the antibiotics including Oxytetracyclin, Ampicillin, Streptomycin, Enrofloxacin, Cephalexin, Ciprofloxacin and Erythromycin. The treatment continued for several days as the dog was refractory to the initial antibiotic administered and did not show any clinical improvement for three days, antibiotic treatment was reviewed and changed after correlating with the hematological and urine cultural sensitivity test reports on third day. The dog started to improve fourth day onwards and got fully recovered on sixth day of the change of antibiotic treatment.

Bilateral opacity of the eyes, referred to as ‘blue eye’ or “pearl eye”, can be seen in

25 per cent of the affected animals 7–10 days after the resolution of the acute clinical signs, and is due to corneal oedema and accumulation of antigen-antibody complexes in the anterior chamber (Wright, 1976). Unilateral or bilateral corneal opacity occurs in convalescent stage and it disappears spontaneously. In the present case the dog was again reported with transient unilateral left corneal opacity (Figure 1) on day eleventh which subsided gradually after five days without any treatment, thus tentatively diagnosing it to be a case of infectious canine hepatitis.

Current methods of detection of CAV infections are based on hematological findings (Mosallanejad *et al.*, 2010), virus

isolation, serological assays (Pratelli *et al.*, 2001), histopathology (Mosallanejad *et al.*, 2010; Yoon *et al.*, 2010), immunohistochemistry (Yoon *et al.*, 2010) and indirect haemagglutination assay (Ditchfield *et al.*, 1962). The blood picture in the present case showed leucocytosis and absolute neutrophilia which is indicative of secondary bacterial infection due to concurrent urine tract infection. The clinical signs such as dysuria manifested by the dog. The viral infection predisposes the animal to secondary infections following lowered immune response or lack of passive or active immunity. In this particular case, the dog was not vaccinated. This suggested that the dog was

**Table 1: Hematological, Biochemical and urine examination of the dog on day 0, 3 and 8 of the treatment**

<b>Days of treatment</b>			
<b>Hematological examination</b>			
<b>Parameter</b>	<b>0d</b>	<b>3d</b>	<b>8d</b>
<b>Haemoglobin (g/dl)</b>	8.0	7.5	8.3
<b>TLC(m/mm<sup>3</sup>)</b>	36.6	42.5	13.7
<b>N (%)</b>	87	90	70
<b>L (%)</b>	11	10	19
<b>M (%)</b>	00	00	00
<b>E (%)</b>	02	00	02
<b>B (%)</b>	00	00	00
<b>PCV (%)</b>	24.6	23.9	26.0
<b>Haemoprotozoan</b>	Negative	Negative	Negative
<b>Thrombocytes (m/mm<sup>3</sup>)</b>	167x10 <sup>6</sup>	149x10 <sup>6</sup>	286x10 <sup>6</sup>
<b>Biochemical examination</b>			
<b>Total Protein(g/dl)</b>	5.5	4.8	6.1
<b>Albumin(g/dl)</b>	2.6	2.3	4.4
<b>ALT(IU/L)</b>	2023	1931	158
<b>BUN(IU/L)</b>	39	35	21
<b>Creatinine (mg/dl)</b>	1.51	1.43	0.95
<b>Urine examination</b>			
<b>Albumin</b>	positive	positive	negative
<b>Pus cells</b>	20-30/hpf	40-45.hpf	2-3/hpf
<b>pH</b>	6.023	6.034	6.015
<b>Specific gravity</b>	1.013	1.022	1.019
<b>Glucose</b>	Negative	Negative	Negative



**Figure 1: Dog showing transient corneal opacity (Blue eye) in left eye**

an inapparent carrier of the virus or lacked adequate maternal antibodies against adenovirus.

The clinical signs of the viral infections such as parvo virus infection, canine distemper and infectious canine hepatitis are overlapping. Acute hepatitis, often accompanied by hemorrhages and disseminated intravascular coagulation, is the most common presentation of acute cases of Infectious canine hepatitis. In the present case study, the history of lack of protective immunity, level of environmental exposure, age of the dog, clinical signs, highly increased liver function parameter (ALT), convulsions, thrombocytopenia, albuminuria and development of transient unilateral corneal opacity in the convalescent stage subsiding spontaneously were suggestive of infectious canine hepatitis affection in the dog.

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