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Ascites in a Doberman pinscher pup due to babesia infection: A case report

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Abstract
The present case study reports a case of ascites in a two and half months old Doberman Pinscher male pup, that was presented with the history of persistent fever, progressive abdominal distension, inappetence, vomition, and depression. Detailed clinical examination, haemato-biochemical and blood smear study confirmed the ascites resulting from babesiosis. Treatment with babesiacidal, antibiotics, diuretics, hepatobiliary drugs resulted in uneventful recovery.

Keywords: Babesiosis, ascites, dog, treatment

1. Introduction
Babesiosis is an important tick-borne haemoprotozoan disease in dogs clinically manifested by anorexia, dehydration, temperature, dullness, depression, emaciation, weight loss, diarrohoea or constipation, pale mucosa, vomition, yellow coloured urine, distended abdomen, ascites etc. Ascites or abdominal effusion may result due to severe hypoproteinaemia, fall of plasma colloid osmotic pressure (PCOP), renal, cardiac or hepatic insufficiency, protein losing enteropathy, abdominal neoplasia etc. of which liver disorder is one of the important causes of this problem (Chakrabarti, 2006) [1].
The present communication describes the clinico-haemato-biochemical, radiographic and ultrasonographic observations in a very rare case of peritoneal effusion due to the pathogenic effect of Babesia infection and its successful recovery.

2. Case history and observations
A two and half months old male Doberman Pinscher pup was presented to the Veterinary Clinical Complex, WBUAFS, Kolkata with a history of loss of appetite, vomition, respiratory distress, depression, yellow coloured urination and the animal was unable to stand properly. The pup was extremely weak, cachectic, dull and disinclined to move. Clinical examination showed temperature 103.5˚F, respiration rate-42/min, heart rate-122/min, anaemic conjunctival mucosa, exaggerated lung sound, pain on palpation on liver and on tactile percussion 'fluid wave' was evident. The owner collected ticks from the body surface and were identified as *Rhipicephalus sanguineus.* Blood smear was examined for presence of haemoprotozoa. Considering the size of the intracellular parasites the pup has been infected possibly with *Babesia spp*. Haematological study showed a low haemoglobin concentration (Hb) – 7 gm/dl, Total erythrocytic count (TEC)-2,250,000/c.mm, total leucocytic count (TLC)-12,500/c.mm, neutrophill-58%, lymphocyte-32%, monocyte-0%, eosinophil-2%, basophil-0%, platelets-1,20,000/c.mm, packed cell volume (PCV)-22%, Biochemical estimation revealed blood sugar (in fasting condition)-85mg/dl, ALT (or SGPT)-80.6 IU/L, AST (or SGOT)-92.2IU/L, ALP-104.5 IU/L, GGT-37 IU/L, amylase – 4926 IU/L, lipase-824IU/L, BUN-32 mg/dl, creatinine-1.2 mg/dl, total protein- 3.2g/dl, albumin-1.2 g/dl, total serum bilirubin- 1.3 mg/dl. Stool was examined where no parasitic ova or oocyst found. Urine analysis showed yellow coloration, slightly hazy in appearance, acidic in reaction, sp. Gravity-1.014, with the presence of bile salt and bile pigment. Abdominal fluid was also analysed which was clean, watery and with sp. gravity-1.012, P^H-7.62, PCV-4%, nucleated cell count-6826 x 10^3/µl, total protein-1.4 g/dl. Radiographic observation revealed diffused and increased radio density. Ultrasonography showed ground glass appearance and anechoic area of abdomen with hepatomegaly and mild spleenomegaly. Electrocardiography showed no abnormality in respect to heart rate, P wave duration and amplitude, R wave amplitude, P-R interval, QRS duration, Q-T interval, duration of S-T segment and T wave amplitude.

3. Treatment and Discussion

The pup was treated with inj. Dextrose 10% intravenously @ 10 ml/kg b.wt. daily for 7 days, Inj. Imidocarb dipropionate @ 6 mg/kg b.wt. sc with Inj. Atropine sulphate @ 0.04 mg/kg b.wt. sc, a combination of furosemide and spironolactone 25 mg tablet bid orally for 15 days, Inj. Vitamin B complex with vitamin C @ 2.5 ml iv daily for 7 days, followed by multivitamin syrup @ 5 ml odpc, infusion of essential amino acids @ 10 ml slow iv daily for 7 days, syrup. Protein hydrolysate @2 tsf tdpc. From the third day, Tablet cefpodoxime proxetil (100) @ 1-tab bdpc started and advised to continue for 5 days. The owner was advised to keep the pup in rest with least disturbance and to provide egg albumen, boiled papaya, sodium restricted and fat free diet along with electrolytes in drinking water. Iron preparation with vit B complex was added with lunch @ 5 ml daily. After 7 days, appetite came to normal with normal attitude and behavior. After 15 days, 2nd dose of Imidocarb dipropionate was given at the same dose rate. After 21 days there was complete recovery and disappearance of ascites manifestations. The blood smear was further examined to observe the presence of babesia. The result was negative.

The clinical signs recorded in this study were similar with the observations of Sunil Kumar *et al*., (2003) [2] and Thushara *et al*. (2006) [3]. The ascitic fluid analysis reports were corroborated with the findings of Wadhwa *et al*. (1995) [4]. Rapid breathing may be due to cranial displacement of the diaphragm by fluid, causing restricted ventilation and low Hb level leads tissue anoxia results into depression (Kruth, 2000) [5]. Ascites leads to increased hepatic and portal venous pressure and percolated fluid accumulates in the peritoneal cavity.

Haematological parameters support the presence of haemoprotozoan infection. Haemolysis may involve proteases produced by the invading parasite, an immune reaction to parasitized cells, or oxidative damage to erythrocytes. Presence of thrombocytopenia may be due to immune mediated platelet destruction and development of disseminated intravascular coagulation (Boozer and Macintire, 2003) [6]. Babesia causes regenerative haemolytic anaemia and thrombocytopenia (Weiss and Wardrop, 2010) [7]. The low level Hb and PCV were possibly due to less erythropoetic activity as a result of hepatic dysfunction as reported by Chakrabarti (loc cit). Increased level of ALT, AST and GGT may result from the leakage of enzymes from hepatobiliary cells into blood (Cornelius, 1987) [8]. Hypoproteinaemia and hypoglycaemia occur due to failure of protein and glucose synthesis in liver dysfunction as well as increasing catabolic activity in liver as per Rakesh and Shanti (1994) [9]. Increased level of bilirubin indicates liver damage.

Regarding treatment of babesia infection, imidocarb dipropionate remains the first-choice treatment against babesia infection (Rocio Checa *et al*., 2017) [10]. Initial treatment involve strict cage confinement as this serves to improve renal perfusion and promote water and electrolyte excretion. Spironolactone being a diuretic of moderate efficacy, it should be combined with potent loop diuretic frusemide (Brater, 1998) [11]. It is recommended that with certain exceptions in specific types of liver dysfunction, treatment of a dog with ascites associated with liver impairment should include confinement, oral and/or iv glucose, parenteral antibiotics, lipotrophic agent like methionine and water-soluble vitamins. Liquid nutritional supplement was given to support normal growth and development, to improve the immune response and reduce susceptibility to diseases. Egg albumen was given as protein supplements that have higher biological value. Electrolytes in drinking water prevent hypokalaemia and maintain acid-base balance. The animal was given sodium free diet to check sodium retention or secondary hyperaldosteronism (Wyllie *et al*., 1980) [12]. Dextrose 10% has been well established in checking dehydration, depleting liver glycogen and preventing tissue catabolism. Infusion of essential amino acids acts as a proteininogenic, lipotrophic and hepatoprotective agent. Medications are determined according to the underlying cause. For instance, fluid buildup due to bacterial infection (known as septic ascites) requires antibiotic therapy. It is important to note that aggressive medication, treatment with diuretics, which are used to remove excess body fluid, may cause low level of potassium in the blood, a condition known as hypokalemia. This can worsen symptoms and lead to further complications. Restrict dietary salt, as it helps control fluid accumulation related to some cause of ascites, such as liver damage, heart failure, and low levels of protein in the blood. Chronic hepatic insufficiency in case of babesiosis could lead to hypoalbuminaemia (Cornelius, loc cit).

4. Conclusion

Ascites resulting from clinical babesiosis diagnosed by microscopic examination, clinical examination in combination with peritoneal fluid analysis, radiography, ultrasonography and haemato-biochemical observations. Any delay in treatment and management may lead to various complications and ultimately may lead to death.

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