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Therapeutic management of acute renal failure associated with Babesiosis in a dog

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Abstract

A 3 year old male Labrador retriever dog positive for haemoprotozoan infection by *Babesia* spp. was presented at Veterinary Polyclinic, Chengannur with a history of increased levels of blood urea nitrogen and serum creatine despite being treated for canine babesiosis. A detailed diagnostic approach including anamnesis, clinical examination, blood smear examination, haematobiochemistry were done. The case was confirmed to be of acute renal failure associated with canine babesiosis. A clinically-feasible therapeutic approach for acute renal failure associated with canine babesiosis has been followed. The animal exhibited clinical improvement on medical treatment and the patient made uneventful recovery in 20 days.

Keywords: Canine babesiosis, *Babesia canis*, acute renal failure, haematobiochemistry, blood urea nitrogen, serum creatinine

Introduction

Renal failure refers to the clinical syndrome that occurs when the kidneys are no longer able to maintain their regulatory, excretory, and endocrine functions, resulting in retention of nitrogenous solutes and derangements of fluid, electrolyte and acid base balance. Renal failure occur when 75% or more of the nephron population is non functional. Acute renal failure is a condition in which there is a sudden and more or less complete shutdown of renal function and consequently clinical signs appear rapidly. Major signs of acute renal failure are oliguria which is a diagnostic feature and uremic signs. Acute renal failure (ARF) is an uncommon complication of babesiosis and typically presents as anuria or oliguria despite adequate rehydration. Possibility of better therapeutic outcomes in ARF associated with canine babesiosis was clearly indicated by decreasing levels of BUN and SCr during the period at different intervals.

Case history and observations

A 3 year old male Labrador retriever dog weighing 43 kg was presented with a history of anorexia and vomiting since 4 days. Owner reported frequent urination and urine is yellow coloured. Physical examination, i.e., recording of physiological parameters and clinical signs were performed. Rectal temperature (101.1°F), ocular mucous membrane was pale and normal sized peripheral lymph node. On blood smear examination, *Babesia canis* could be detected. To recognize underlying urinary dysfunction serum samples was collected. A increased levels of blood urea nitrogen (157 mg%) and serum creatinine (5.3 mg%) were noticed.

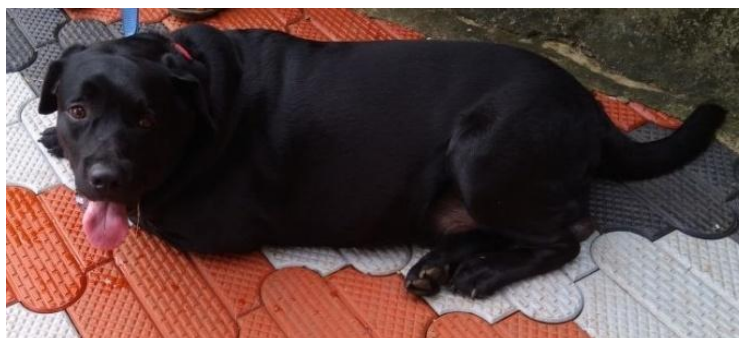


Fig 1: Animal brought to the clinic

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Treatment

Therapeutic management for ARF was initiated as per the guidelines after a clinically-feasible diagnostic approach. The specific therapy for canine babesiosis was started with clindamycin @ 11 mg/kg b.wt, q 24 h, P.O. Therapeutic regimen also included (i) fluid replacement by IV infusion of DNS @ 500 ml followed by Ringers lactate (RL) @ 250 ml; (ii) frusemide @ 2 mg /kg b.wt. IV until normal urination was achieved; (iii) Ondansetron @ 0.5 mg /kg b.wt. IV to control vomiting; (iv) H2 blocker Pantoprazole @ 1 mg/kg b. wt. IV; (v) iron supplement @ 1 tsp BID/day.

The dog was subjected to serum biochemistry on 4th day post-treatment, which revealed that the levels of BUN and serum creatinine increased to 174 mg/dl and 6.2 mg/dl respectively. The 4th day post-treatment levels of BUN and SCr were still higher as compared to previous levels and therapeutic management was continued. The dog was again subjected to serum biochemistry on 8th day post-treatment, which revealed that BUN and SCr decreased to 84 mg/dl and 2.4 mg/dl

respectively (*i.e.*, nearing towards normal range). But the animal was extremely anaemic and the level of Haemoglobin and PCV was very low (4g/dl and 12% respectively). As the dog being treated with clindamycin, the specific therapy for canine babesiosis was switched over to Imidocarb dipropionate @ 6.6 mg/kg b.wt., S/C once in 2 weeks. And also given Erythropoietin injection 2000 IU S/C to stimulates division and differentiation of red blood cells, repeated twice at weekly interval. The dog showed clinical improvement in terms of hydration status, normal urination, improvement in feed intake, absence of vomiting, improved activity and alertness on 14th day post-treatment. Furthermore, the dog subjected to serum biochemistry on 14th day post-treatment which revealed that levels of BUN and SCr decreased to 32 mg/dl and 1.3 mg/dl respectively were indicative of improved renal functions. The haemoglobin and PCV levels increased to 11 g/dl and 33% respectively. The animal recovered uneventfully.

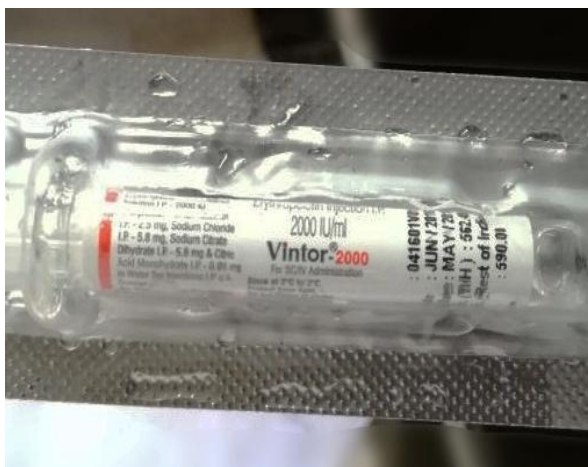


Fig 2: Vintor-2000, Erythropoietin injection 2000IU/ml



Fig 3: Animal after recovery

Discussion

Canine babesiosis is an important world-wide tick born disease caused by the intra-erythrocytic protozoa parasites *B. canis* and *B. gibsoni*. Canine babesiosis due to *Babesia canis* infection manifests with a wide variety of signs. Haemolytic anaemia combined with fever, lethargy, water hammer pulse and splenomegaly are the hallmarks of the disease (Malherbe W D, Parkin B S, 1951) [4]. Although the disease primarily involves erythrocyte destruction, it may also result in multisystemic involvement. Acute renal failure (ARF) is an uncommon complication of babesiosis and typically presents as anuria or oliguria despite adequate rehydration.

Evidence of renal damage, reflected on urinalysis by the presence of proteinuria, casts and renal tubular epithelial cells, is common in both complicated and uncomplicated cases, but does not necessarily reflect or predict renal failure. Intravascular haemolysis is a recognized cause of ARF in the dog (Chew D J, Dibartola S P, 1989) [2], and may cause ARF in babesiosis (Pages J P, 1992) [5]. This could be due to blockage of renal tubules by desquamated tubular cells and/or haemoglobin casts (Button C, 1976) [1].

BUN and serum creatinine are strong indicators of renal functions in dogs. Elevated levels of BUN and serum creatinine are the findings in dogs with ARF and babesiosis (Zynger *et al*, 2007) [6]. Dietary protein restriction and use of urinary alkalinizers are effective supportive therapy to regain normal renal functions. Advanced stages may show clinical

anaemia in patients due to disturbance in erythropoietin synthesis mechanism. Anaemia may be prevented by provision of iron supplement in the diet. Fluid therapy and furosemide have better clinical outcomes in uncomplicated cases of ARF. Fluids containing normal saline should be used.

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