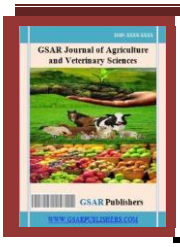

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Clinical Management of Acaricide poisoning and Jaundice in an 8-month old Male Pit Bull dog.

By

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Abstract

Jaundice in dog is a clinical condition marked by yellowish colouration of skin, sclera and mucous membranes. An 8-month-old male Pitbull dog was presented to Pet Health Clinic, Arepo Ogun State with complain of anorexia for about two weeks. The dog was said to have had a chemical(acaricide) bath two weeks prior to presentation. Physical examination showed yellow discolouration of the mucus membranes and gum. The haematological findings showed normocytic normochromic anaemia. The white blood cells show hyper raised distribution with increased neutrophils in the peripheral blood stream. Kidney function test revealed high creatine and BUN levels. Liver function test also shows high Bilirubin and Globulin suggestive of jaundice. Blood smear examination was found negative for haemoparasite. The animal was treated with Amoxicillin Clavulanate at 15mg/kg twice daily for 7 days. Supportive treatment like hematinic, multivitamins, supplement and fluid therapy were administered. Re-evaluation of some parameters after seven days showed that the dog had fully recovered and appetite was completely restored.

Keywords: *Anaemia, Bilirubin, Jaundice*

INTRODUCTION

Jaundice is a clinical condition characterized by yellow coloration of the white of the eyes (sclerae) and skin due to deposition of bilirubin due to its elevated levels in the serum (Satyanarayana and Chakrapani, 2022). The increased concentration of serum bilirubin is also known as hyperbilirubinemia (Schwarzenbach 2013). Deposition of bilirubin happens only when there is an excess of bilirubin, a sign of increased production or impaired excretion. Bilirubin has two constituents: unconjugated (indirect) and conjugated (direct), and hence increase in any one of these results in jaundice. Jaundice is considered as an essential clinical indicator for liver disease, apart from various other insults (Vítek and Ostrow 2009). However, it is important to know the underlying cause of jaundice. Causes of jaundice may be congenital or acquired. In animals, jaundice is often associated with disorders involving the gallbladder or extrahepatic biliary structures and abdominal effusion may reflect bile peritonitis. Jaundice also reflects an assembly of hepatic as well as hematologic diseases, including diseases directly impacting or obstructing bile flow or other disorders that causes hepatocellular dysfunction thereby impairing elimination of bilirubin.

The haemolytic or hematopoietic abnormalities increase the bilirubin production beyond the ability of liver to metabolize it thereby increasing its concentration in blood. Jaundice is classified into three types as per the localization of provoking cause as prehepatic, hepatic, or post-hepatic (Satyanarayana and Chakrapani 2022; Mousumi et al., 2022). Prehepatic jaundice reflects enhanced bilirubin formation due to haemolysis that may be caused by protozoa (Anaplasma spp, Babesiosia spp etc.), bacteria and viruses, poisons and incompatible blood transfusions. Hepatic jaundice could be caused by chemicals (Chloroform, carbon tetrachloride, phosphorus), neoplasm, viruses etc. Post hepatic jaundice occurs due to obstruction in the biliary passages which could be either extrahepatic or intrahepatic or both like in cholangitis, cholecystitis, gall stones or carcinoma of bile duct (Brar et al., 2014) . The prehepatic form of jaundice in dogs is due to haemoprotozoal infections like anaplasmosis, babesiosis, listeriosis etc. Ongoing haemolysis of RBCs in sufficient magnitude causes persistent jaundice that would cause death due to anaemia. Various causes of anaemia include infection or acute/chronic haemorrhage due to hemoprotozoan infections, bleeding disorders such as thrombocytopenia or coagulopathies drugs, and toxic plants such as warfarin poisonings (Bhikane andKawitker, 2002). The predominant clinical signs of jaundice are anaemia,

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weakness, pale mucous membranes, tachycardia and tachypnoea. Severe intravascular haemolysis may cause hemoglobinemia and haemoglobinuria (dark coloured urine))

CASE HISTORY

A male Pit Bull dog months old with a body weight of 18 kg was presented at Pet Health Veterinary Clinic. Arepo, Ogun State. The animal has a history of anorexia for two weeks, weakness and lethargy. The dog had earlier been presented to the clinic two weeks ago for mange infestation. The dog had a chemical bath (with acaricides) carried out by the owner around that period also.

CLINICAL EXAMINATION

The dog revealed increased respiratory rate (35 breaths per minute), yellowish mucus membrane and conjunctiva, shrunken eye ball, dehydration (6%), and enlarged lymph nodes. There were no ticks on the body and the dog had completely recovered from mange infestation upon presentation. The body temperature was 38.5 degree Celsius, and pulse 110 beats per minute.

MANAGEMENT PLAN

Approximately, 5 ml blood was collected from the dog by using 21-gauge needle attached to 5 ml syringe through cephalic o venipuncture. A fraction of whole blood was transferred into K3-EDTA vacutainer tubes for estimation of haematological and electrolyte parameters including liver and kidney function test

A part of whole blood collected in K3-EDTA vacutainer tubes from the dog was used for preparation of thin blood smear by using commercially available Wright Giemsa stain for detection of haemoprotozoa. Then the stained slide was examined carefully under oil immersion objective (100X) to any haemoparasite. Blood smear examination was performed on the day of blood collection.

SUPPORTIVE THERAPY

About 1700ml of dextrose saline was infused to the dog over a period of 24 hours. This value was gotten by adding the maintenance daily fluid volume (50ml per kg) to replacement daily fluid based on the percentage dehydration (6%).

RESULT

The results of haematology, electrolyte, kidney function and liver function tests are shown in Tables 1,2,3 and 4 respectively. Microscopic examination of blood smear showed absence of any haemoparasite.

TABLE 1 RESULT OF HAEMATOLOGICAL PARAMETERS OF AN 8-MONTH-OLD MALE DOG

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
WBC	35.0	$X10^9/L$	6.0 – 12.0	High
Lymph %	6.8	%	12.0 – 30.0	Low
MID %	7.1	%	5.0 – 20.0	
Neut %	85.7	%	60.0 – 70.0	High
Eos%	0.3	%	0.5-10.0	Low
Bas%	0.1	%	0.0-1.3	
Lymph #	2.4	$X10^9/L$	1.5 – 5.0	
MID #	2.5	$X10^9/L$	0.2 – 2.1	High
Neut #	30.0	$X10^9/L$	3.0 – 11.0	High
Eos #	0.1	$X10^9/L$	0.04-1.62	
Bas #	0.0	$X10^9/L$	0.00-0.12	
RBC	6.0	$X10^{12}/L$	6.0 – 12.0	
HB	13.6	g/dl	10.0 – 18.0	
HCT	36.0	%	35.0 – 55.0	
MCV	60.1	Fl	60.0 – 70.0	
MCH	22.7	Pg	13.0 – 19.0	High
MCHC	37.8	g/dl	31.0 – 37.0	High
RDW – SD	33.6	Fl	37.0 – 54.0	Low
RDW –CV	14.2	%	11.0 – 15.5	
PLT	130	$X10^9/L$	140 – 400	Low
MPV	8.9	Fl	7.0 – 12.0	
PDW	19.2	%	9.0 – 30.0	
PCT	0.1	%	0.1-9.99	

TABLE 2- RESULT OF ELECTROLYTE LEVELS OF AN 8-MONTH-OLD MALE DOG

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
Sodium	141.9	mmol./l	140.3 – 153.9	
Potassium	4.4	mmol/l	3.8 – 5.6	
Chloride	103.7	mmol/l	102.1 – 117.4	
Bicarbonate	22.7	mmol/l	18.1 – 24.5	
Total Calcium	2.6	mmol/l	2.3 – 2.9	
Ionized Calcium	1.3	mmol/l	1.2 – 1.4	
Ph	7.5		7.32 – 7.42	
Anion Gap	15.5	mmol/l	8.0 – 16.0	

TABLE 3- RESULT OF KIDNEY FUNCTION TEST OF AN 8-MONTH-OLD DOG

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
BUN	21.9	mmol/l	3.1 – 9.2	High
Creatinine	3.7	Mg/dl	0.5 – 1.6	High

TABLE 4: RESULT OF LIVER FUNCTION TEST OF AN 8 MONTH OLD DOG

TEST	RESULT	UNIT	REFERENCE VALUE	Alert
Total Protein	65.4	g/l	55.1 – 75.2	
Albumin	23.5	g/l	25.8 – 39.7	Low
Globulin	42.6	g/l	20.6 – 37.0	High
AST	23.8	U/L	10 – 40	
ALT	109	U/L	7 – 56	High
ALP	186	U/L	44.0 – 147.0	High
Total Bilirubin	360	mmol/l	1.71 – 10.3	High
Direct Bilirubin	276	mmol/l	0.0 – 5.1	High
Indirect Bilirubin	84.0	mmol/l	1.7 – 5.1	High
GGT	21.6	U/L	1.0 – 9.7	High

TREATMENT

The dog was treated with antibiotics containing Amoxicillin clavulanic acid at the dosage 15mg/kg body weight. This was administered twice daily, orally for 7 days. The Dog was also exposed to early morning sun for 15 minutes daily for a week. A supplement named Cellgevity® which contains Riboceine was also administered to the dog daily for a month at the dosage of 10mg/kg. Vitamin B plus E supplement was administered daily for one week.

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DISCUSSION

Based on haematology, liver and kidney function tests, the dog was said to be jaundiced. The haematological study revealed normocytic normochromic anaemia and high values of White blood cells. The anaemia in the dog is due to intravascular haemolysis. This finding correlates with the findings of Meinkoth et al. (2002) and Kumar et al. (2020). The hypoalbuminemia and hyperglobulinemia that was observed in the present case might be due to stress on liver or kidney which is in accordance with the findings of Vijayalakshmi et al. (2014). The elevated values of total and indirect bilirubin observed in the dog indicate jaundice, which might be due to hepatotoxicity caused by the acaricides used on the dog two weeks before presentation (Rafaj et al. (2007). The elevated levels of creatinine and Blood urea nitrogen was as a result of reduced kidney function and dehydration. Geimsa staining didn't reveal any blood protozoan in the blood smear examination, but history of use of acaricide following mite infestation (mange) suggests that this acaricide must have been responsible for the liver damage leading to jaundice. Fluid therapy is a very effective management procedure in handling dehydration due to Jaundice. Amoxicillin-clavulanate and certain third generation cephalosporins and fluroquinolones are often considered safe in managing liver disease in dogs. Aminoglycosides should be avoided due to nephrotoxicity. Riboceine containing compounds such as Cellgevity® helps to promote the production of gluthatione which helps to remove toxins and neutralize free radicals.

CONCLUSION

This case highlights the importance of early diagnosis and prompt therapeutic intervention to address both acaricide toxicity and jaundice. This case underscores the efficacy of the use of some antibiotics, Riboceine and other supportive therapy agents in managing jaundice. Regular monitoring and follow up ensured full recovery, emphasizing the importance of comprehensive care in such cases. This report also reinforces the need for proper awareness about the use of acaricides in dogs.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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