CASE REPORT
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ACUTE HAEMOLYTIC JAUNDICE ASSOCIATED WITH FELINE MYCOPLASMOSIS AND ITS MEDICAL MANAGEMENT

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ABSTRACT

A one and half-year-old tom cat was presented to University Veterinary Hospital, Kokkalai, Thrissur, Kerala with anorexia, jaundice and weakness. The cat had fever and the skin and mucous membranes were icteric. Peripheral blood smear examination revealed epierythrocytic organisms suggestive of *Mycoplasma spp*. Haematobiochemical examination revealed severe anemia, thrombocytopenia and marked hyperbilirubinaemia. Feline panleukopenia and Feline infectious peritonitis were ruled out by rapid immunochromatographic test kits. The results of microscopic agglutination test (MAT) and *lipl32 gene* specific PCR were also negative, thus ruling out leptospirosis. The case was tentatively diagnosed as feline mycoplasmosis. The cat responded to medical therapy with doxycycline, ursodeoxycholic acid, haematinics and supportive therapy.

Keywords: Feline mycoplasmosis, Haemolytic anaemia, Hyperbilirubinemia

INTRODUCTION

Feline mycoplasmosis or feline infectious anemia is a disease of cats caused by *Mycoplasma* spp. organisms, previously known as *Haemobartonella*. Mycoplasma organisms are gram negative, non-acid-fast, cell wall lacking bacteria that parasitize erythrocytes (Messick and Harvey, 2012). In a retrospective study on anaemic cats, the frequency of haemotropic mycoplasma infection was 14 percent (23/170) and the one-year survivability was 65 percent in haemotropic mycoplasma infected cats (Nibblett *et al*., 2009). The prevalence of mycoplasma was more in stray cats (15.9 per cent, n=138) than client-owned cats (9 per cent, n=456). Moreover, tom cats are more likely to be affected (16.1 per cent) when compared to queen cats (4.3 percent) (Díaz-Regañón *et al*., 2018).

CASE HISTORY AND OBSERVATION

A one-and-a-half-year-old tom cat weighing 2.75 kilogram was presented to University Veterinary Hospital, Kokkalai with the medical history of anorexia, rapid onset jaundice, and weakness. Chronic hyporexia for more than a week preceded complete anorexia. Vaccination and deworming schedules were not regular. The cat appeared alert, yet was weak, especially during movement. The important clinical examination findings were pyrexia (104 F) and yellow discolouration of skin, ear pinna, conjunctival mucous membranes, and foot pads (Figure. 1, 2). Microscopic examination of peripheral blood smear detected the presence of moderate number of epierythrocytic organisms suggestive of *Mycoplasma spp*., whereas coprological examination was negative.Haematological alterations were marked macrocytic hypochromic anaemia with very low haematocrit (HCT, 11.4 %), high mean corpuscular volume (MCV, 98 fL) and a low thrombocyte count of 85× 10^3/ µL (Table 1). Serum biochemical analysis revealed a marginal rise in alkaline phosphatase, and alanine amino transferase, whereas the increase was significant for total bilirubin (20.21 mg/dL), direct bilirubin (18.00 mg/dL), and blood urea nitrogen (BUN, 62.28 mg/dL). The level of serum creatinine remained within the normal reference range (Table 1).

Rapid immune-chromatographic test kit for feline panleukopenia virus and feline infectious peritonitis virus were negative. Serum sample was subjected to microscopic agglutination test (MAT) using 12 reference strains of leptospira maintained in the Department of Veterinary Microbiology, College of Veterinary and Animal Sciences, Thrissur, Kerala. The test was found to be negative for all the reference strains. Polymerase chain reaction was conducted employing primers targeting *lipl32* gene conserved among all pathogenic leptospires (Krishna *et al*., 2013) and the result was negative. Therapeutic management with doxycycline (@ 10 mg/Kg, IV, OD) and pantoprazole (1.0 mg/Kg, IV, OD) along with fluids and electrolytes for four days was quite rewarding. Oral supportive therapy included ursodeoxycholic acid (15 mg/ Kg PO in divided doses), and oral haematinics. Clinical improvement was evident from the next day onwards as evidenced by better food and water intake and improvement in general activity. After four days of parenteral therapy, doxycycline was continued *per os* for the next 14 days and supportive therapy was continued. The improvement observed by day-10 was remarkable and the cat regained its normal activity and food intake. Signs of jaundice were completely absent on skin, foot pads and mucous membranes. (Fig. 3).

Table 1: Haemato-biochemical findings of the affected cat

BLOOD VALUE	RESULT	NORMAL RANGE
WBC (x 10^3 /µl)	12.33	5.5 – 19.5
Lymphocytes (x 10^3 /µl)	0.789	1.5 – 7
Monocytes (x 10^3 /µl)	1.12	0 – 0.85
Neutrophils (x 10^3 /µl)	10.71	2.5 – 12.5
Eosinophils (x 10^3 /µl)	0.189	0 – 1.5
Basophils (x 10^3 /µl)	0.061	Rare
RBC (x 10^6 /µl)	1.17	5 – 10
HGB (g/dL)	3.4	8 – 15
HCT (%)	11.4	24 – 45
MCV (fL)	98.5	39 – 55
MCH (pg)	29.0	13 – 17
MCHC (g/dL)	29.6	31 – 35
Platelet (x 10^3 /µl)	85	300 – 800
ALP (IU/L)	105.1	0- 45
ALT (IU/L)	134.2	25- 97
Total bilirubin (mg/dL)	20.21	0- 0.1
Direct bilirubin (mg/dL)	18.00	0
BUN (mg/dL)	62.28	19- 34
Creatinine (mg/dL)	0.454	0.9- 2.2

(Source: Schalm's Veterinary Haematology, 6th Edn., 2010 & Merck Veterinary Manual-online)

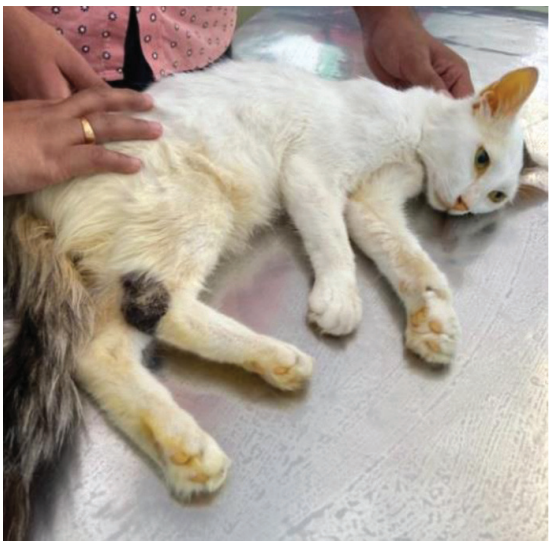

Figure 1: Before treatment: Lethargy and icteric foot pads

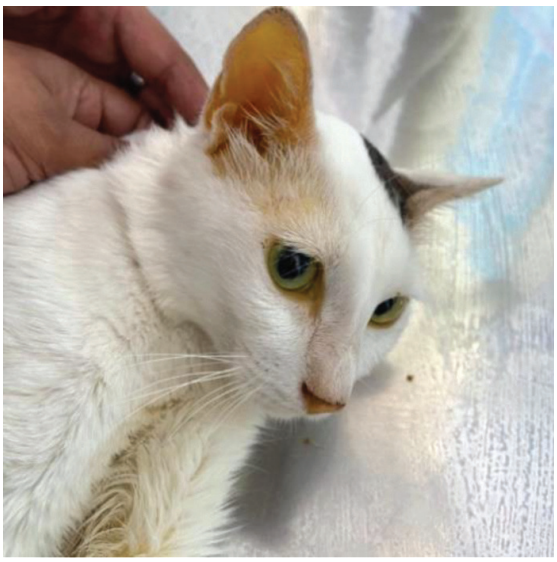

Figure 2: Before treatment: Icteric ear pinna

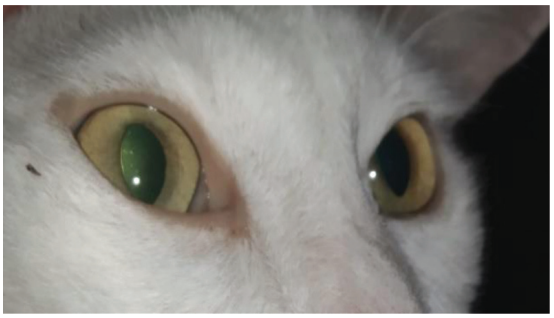

Figure 3: Bright eyes on day-10

TREATMENT AND DISCUSSIONS

Microscopic examination of stained peripheral blood smear revealed the presence of *Mycoplasma* spp. organisms on erythrocytes. Though confirmatory diagnosis of *Mycoplasma* spp. by species-specific PCR was not performed, an important differential for the pattern of signs of anaemia, thrombocytopenia and jaundice i.e., leptospirosis was ruled out by microscopic agglutination test as well as *lipl32* gene specific PCR. Feline immunodeficiency virs(FIV) and Feline leukemia virus (FeLV) are two viral infections in cat which are associated with anaemia. FIV has been characterized by anaemia, leukopenia or a combination of cytopenias (Sellon and Hartmann, 2012) whereas immune mediated hemolysis has been reported in FeLV in cats (Hartmann, 2012). Another consideration for jaundice was infectious or toxic hepatopathies. A serum ALT value of 134.2 IU/L ruled out the presence of severe hepatocellular damage commensurate with markedly elevated serum hyperbilirubinemia. Moreover, a rapid response to doxycycline therapy ruled out the possibility of toxic hepatopathies.

The severity of disease in feline mycoplasmosis varied from mild anemia or no clinical signs to severe anemia and death. Clinical signs in typical cases included weakness, anorexia, weight loss, anemia, and jaundice. Jaundice developed in cats with severe hemolysis. Low haematocrit and thrombocytopenia were the important haematological alterations (Messick and Harvey, 2012). These findings were noticed in the affected cat; however, icterus was quite high with a total serum bilirubin concentration of 20.21 mg/dL and direct bilirubin of 18.0 mg/dL. ALT and ALP values were slightly elevated as seen in any case of jaundice. Haematology revealed severe anaemia (HCT: 11.4 percent) and thrombocytopenia (85 x 10^3/µL). A high mean corpuscular value (MCV) of 98.5 fL indicated strong regeneration in the bone marrow. Adequate erythroid regeneration is a good prognostic indicator in severe anaemia.

The reasons for jaundice included hepatic, pre-hepatic and post-hepatic causes. On the basis of the following clinical and laboratory findings such as rapid onset of jaundice, severe anaemia, thrombocytopenia, hyperbilirubinaemia, presence of *Mycoplasma* spp. organisms

in blood smear, exclusion of infectious etiologies of leptospirosis, feline panleukopenia and feline infectious peritonitis infections, a speedy recovery with doxycycline and an absence of relapse within one year, strongly indicated that rapid haemolysis or pre-hepatic cause was the reason for jaundice. Elimination of feline haemotropic mycoplasma infection using drug therapy is difficult and cats usually remain as carriers. Antibiotics used successfully in the control of infection were doxycycline (@ 10 mg/kg PO q24h for three weeks) and tetracycline. Enrofloxacin @ 5 mg/kg PO q24h for two weeks was beneficial, but higher doses or prolonged dosing are associated with retinal degeneration in cats. Another alternative was marbofloxacin @ 2 mg/kg PO q24h. Azithromycin and imidocarb were not effective in the treatment of haemotropic mycoplasmosis in cats (Messick and Harvey, 2012). In the present case doxycycline @ 10 mg/kg intravenously for four days followed by oral therapy at the same dose for two weeks resulted in an uneventful recovery. There was no report of relapse of infection on a review of the case a year later. Glucocorticoids may be indicated along with antibiotic as anemia is partly due to immune mediated hemolysis. A tapering dose of prednisolone starting at 2 mg/kg PO OD has been recommended. However, cats recover even without requiring corticosteroid treatment (Tasker *et. al*., 2018). Glucocorticoids were not administered in the present case. Ursodeoxycholic acid is indicated in conditions of cholestasis and icterus. It is a hydrophilic bile acid with cytoprotective action in the biliary system. The general dose recommended for cats is 10 to 15 mg/kg q24h OD or in divided doses (Allerton, 2020). Supportive therapy and correction of dehydration is important. Ancillary strategies included oral haematinics and blood transfusion in severe anemic cases.

CONCLUSION

This article documented the successful medical management of feline mycoplasmosis in a tom cat presented with marked icterus. The cat responded to medical management with doxycycline and supportive therapy. This case also emphasizes the importance of considering feline mycoplasmosis as an important differential in cats presented with anemia and icterus.

REFERENCES:

Allerton, F. 2020. *Small Animal Formulary*. (10th Ed.). BSAVA, pp. 421.

Díaz-Regañón, D., Villaescusa, A., Ayllón, T., Rodríguez-Franco, F., García-Sancho, M., Agulla, B. and Sainz, Á. 2018. Epidemiological

study of hemotropic mycoplasmas (hemoplasmas) in cats from central Spain. *Parasit. Vectors*. **11**:1-9.

Hartman, K. 2012. Feline Leukemia Virus Infection. In: Greene, C.E. (ed.). *Infectious diseases of the dog and cat*. (4th Ed.). Elsevier-Saunders Publications, pp.108- 135.

Krishna, V., Joseph, S., Ambily, R., Mini, M., Anto, L. and Mohan, S. G. 2013. Cloning and sequencing of the virulent gene LipL32 of Leptospira interrogans serovar Autumnalis. *Vet World*. **6**: 193-195.

Messick, J.B. and Harvey, J.W. 2012. Hemotropic mycoplasmosis (Hemobartonellosis). In: Greene, C.E. (ed.). *Infectious diseases of the dog and cat*. (4th Ed.). Elsevier-Saunders Publications, pp.310-319.

Nibblett, B.M.D., Snead, E.C., Waldner, C., Taylor, S.M., Jackson, M.L. and Knorr, L.M. 2009. Anemia in cats with hemotropic mycoplasma infection: Retrospective evaluation of 23 cases (1996–2005). *Can. Vet. J.* **50** (11): 1181.

Sellon, R.K. and Hartman, K. 2012. Feline Immunodeficiency Virus Infection. In: Greene, C.E. (ed.). *Infectious diseases of the dog and cat*. (4th Ed.). Elsevier-Saunders Publications, pp.136- 149.

Tasker, S., Hofmann-Lehmann, R., Belák, S., Frymus, T., Addie, D.D., Pennisi, M.G., Boucraut-Baralon, C., Egberink, H., Hartmann, K., Hosie, M.J. and Lloret, A. 2018. Haemoplasmosis in cats: European guidelines from the ABCD on prevention and management. *J. Feline Med. Surg*. **20**: 256-261.