
SUCCESSFUL THERAPEUTIC MANAGEMENT OF RENAL INSUFFICIENCY ASSOCIATED WITH MYCOPLASMOSIS IN A CAT

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ABSTRACT

A two and a half year old male Persian cat was presented to the Teaching Veterinary Clinical Complex, Pookode with a history of vomiting, inappetence, reduced urine output and diarrhea since one week. Peripheral blood smear examination revealed presence of *Mycoplasma haemofelis* organisms. Serum biochemistry revealed elevated serum creatinine and ultrasonographic evaluation revealed hyperechoic cortex of the kidney. So, based on history, laboratory evaluations and ultrasonographic findings, the case was diagnosed as renal insufficiency associated with *Mycoplasma haemofelis*. Treatment with intravenous fluids, Enrofloxacin and supportive medications yielded clinical recovery by day 10 post-therapy.

Keywords: Persian cat, Reduced urine output, Renal insufficiency, *Mycoplasma haemofelis*

INTRODUCTION

Acute renal failure (ARF) is defined as the sudden decrease in renal function characterized by its inability to regulate fluid, electrolyte, and acid-base balance (Elliot and Cowgill, 2000). Acute azotemia can be classified as prerenal, intrinsic renal and post-renal based on the origin of the lesion. Prerenal failure is due to ischemia resulting from dehydration/hypovolemia and can be corrected by adequate fluid therapy. Post renal failure can be due to obstruction in the renal, ureteral or urethral region, or maybe due to urinary leakage and can be resolved by removal of the obstruction and correction of leakage, respectively (Worwag and Langston, 2008). Serum creatinine, though a non-specific indicator of renal damage is still used extensively to assess kidney function. Prognosis is variable with ARF in cats and fewer reports are available regarding the same. Earlier diagnosis, staging, and intervention can lead to a more favourable

outcome compared to a later diagnosis.

Feline hemoplasmosis is caused by a group of Mycoplasmas, earlier called as *Hemobartonella*. This includes *Mycoplasma haemofelis*, *Candidatus Mycoplasma haemominutum* and *Candidatus Mycoplasma turicensis* (Ishak *et al.*, 2008). *Mycoplasma haemofelis* a gram negative bacteria and located on epicellular portion of erythrocytes is responsible for causing feline infectious anaemia (Gazyagci *et al.*, 2018). Transmission majorly depends on fleas and ticks. They can also be transmitted via blood transfusion from an infected animal. Vertical transmission from infected mother to kittens is also possible. Clinical signs may range from asymptomatic to life threatening crises caused due to anaemia (Willi *et al.*, 2007).

CASE HISTORY AND OBSERVATIONS

A two and half year old male Persian cat was presented to the small animal outpatient unit of Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Pookode, Kerala, with a history of vomiting, inappetence and diarrhoea since one week and decreased frequency and quantity of urine output since 3 days. Animal was hypothermic with a temperature of 98.4 °F, pale pink mucus membrane, dull and depressed with weak pulse. Haemogram

of the animal showed marked lymphopenia and granulocytosis and serum biochemical evaluation showed elevated creatinine, calcium and phosphorus values (Table 1). Peripheral blood smear examination stained with Giemsa stain revealed presence of peripherally located dark stained Mycoplasma organisms (Fig. 2). Ultrasonographic examination revealed slightly enlarged kidneys with hyperechoic renal cortex (Fig.1), hepatomegaly and thickened mucosa of urinary bladder, stomach and intestine. Based on history, clinical, laboratory and ultrasonographic findings, the case was diagnosed as renal insufficiency associated with Mycoplasmosis.

TREATMENT AND DISCUSSION

The cat was treated with Ringer's lactate @ 10 ml/kg body weight, normal saline @ 20 ml/kg body weight, pantoprazole @ 1mg/kg body weight, and sodium bicarbonate (7.5%) @ 1mEq/kg body weight, intravenously for 10 days and 2 doses of long-acting enrofloxacin was administered @ 5mg/kg body weight at 72 hours interval subcutaneously. Syrup RKleen @ 2.5 ml once daily, tablet Lisybin @ 0.5 tablet twice daily and syrup Gelusil @ 1ml twice daily were given orally for 10 days. On 7th day post-therapy serum biochemical values came back to normal range (Table 2) and the



Fig. 1: Ultrasonography of right kidney with renomegaly (Length = 4.7cm) and hyperechoic cortex

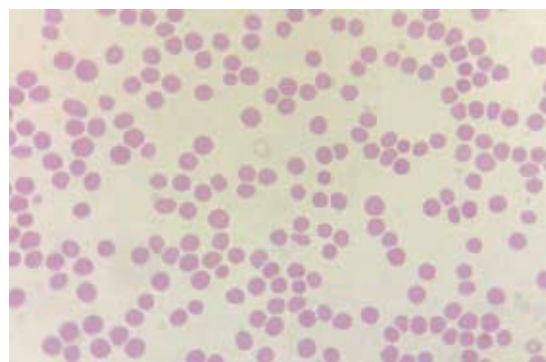


Fig. 2: Blood smear showing intracellular Mycoplasma organisms (Giemsa staining)

Table 1: Haematology and serum biochemical changes of the cat with ARF on the day of presentation (Day 0)

Parameters	Cat (with ARF)	Normal range
WBC ($10^3 / \mu\text{l}$)	13.7	5.5 -19.5
Lymphocytes (%)	6.3	27-36
Granulocytes (%)	90.3	45-64
Monocytes (%)	3.4	0-5
RBC ($10^6 / \mu\text{l}$)	7.45	5-10
Haemoglobin (g%)	9.5	9.8-15.4
PCV (%)	29.2	30-45
Platelets ($10^3 / \mu\text{l}$)	287	300-800
Creatinine (mg/dl)	4.356	0.8 -2.3
Calcium (mg/dl)	12.84	7.5 -10.8
Phosphorous (mg/dl)	13.07	3 -7

cat showed improvement in clinical signs. By day 10 post-therapy, the cat regained appetite, started taking water and improved biochemical parameters were observed (Table 2). Peripheral blood smears on 10th day post-therapy revealed absence of the organism.

The mortality rate in cats with ARF was found to be 47 per cent. Urine

production in cats was identified as a prognostic indicator. Cats with non-oliguria have better chances of survival compared to oliguric and anuric cats (Worang and Langston, 2008). However, some studies revealed no association between azotaemia and the outcome in cats with ARF (Langston *et al.*, 1997). A study on dogs with ARF showed that even dogs with initial severe increase in serum creatinine might recover

Table 2: Serum biochemical changes during the treatment period

Parameters	7 th day follow-up	10 th day follow-up	Normal range
Creatinine (mg/dl)	1.71	1.69	0.8 -2.3
Calcium (mg/dl)	9.204	9.42	7.5 -10.8
Phosphorous (mg/dl)	4.636	4.56	3 -7

with normal serum creatinine value (Vaden *et al.*, 1997). Infectious as well as toxicity are among the leading causes of ARF in dogs and cats. Hyperkalaemia is a common laboratory manifestation in oliguria and anuria associated with ARF (Langston and Gordan, 2021). Physiologic (0.9 per cent) saline contains no potassium and is a suitable choice for the hyperkalemic patient (Langston, 2009). Decreased ability to reabsorb and recycle bicarbonate coupled with reduced excretion of hydrogen ions by the damaged renal tubules in acute kidney injury leads to metabolic acidosis which can be effectively treated with sodium bicarbonate (Monaghan *et al.*, 2012). In the current case study, early diagnosis and proper treatment with fluids, renal supplement and phosphate binder was found to reverse ARF during a 10-day treatment period. Cats infected with *Mycoplasma hemofelis* showed lower levels of total RBC count, Haemoglobin and PCV, but no statistical difference was observed in total WBC and total Platelet count (Santos *et al.*, 2014). Treatment of *Mycoplasma* spp. with enrofloxacin @ 5 - 10 mg/kg PO q 24 h for 14 days was well tolerated by cats and was equally effective

or more effective than doxycycline @ 5 mg/kg PO q 12 h for 14 days (Dowers *et al.*, 2002). Serum creatinine, calcium and phosphorous values though non-specific were found to be useful in diagnosis and evaluating treatment response in cats with acute renal failure. The mechanism of renal failure by *Hemobartonella* is not understood. However, it has been thought that renal failure causes metabolic reactions inducing oxidative stress and can cause reactive *Hemobartonella* infection from latent organisms (Gazyagci *et al.*, 2018). In the current study, *Mycoplasma* was found on peripheral blood smear examination and renal insufficiency was diagnosed based on serum creatinine and decreased urine output. Stress induced by renal insufficiency may have been a contributing factor for Mycoplasmosis.

CONCLUSION

A two and a half year old male Persian cat with a history of vomiting and diarrhoea was diagnosed with renal insufficiency based on history, laboratory evaluation and ultrasonographic findings. The cat was treated with fluid therapy,

enrofloxacin for Mycoplasma, sodium bicarbonate, Lisybin, RKleen syrup as renal supplement, and Gelusil syrup as phosphate binder.

Ethics statement: This study does not involve animal experimentation and was conducted on cases reported in the hospital, following standard operating protocols of animal handling and sample examination, upon informed consent of owners.

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