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### Research Article

## Incidence and Management of Renal and Hepatic form of Equine Leptospirosis – A Report

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### Keywords

Equine Leptospirosis,  
Renal,  
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Urine,  
MAT and Treatment

### Abstract

A Kathiawari stallion, aged 8 years was presented Veterinary Hospital, Clinician Centre, Cuddalore with the case history of intermittent appetite and polyuria. Clinical examination revealed normal rectal temperature, congested conjunctival mucous membrane, dark yellow coloured urine, increase in heart and respiratory rates. Laboratory examination showed normal haematological values except for leucocytosis and decreased platelet count. Serum biochemistry showed an increase in BUN, Creatinine, Alkaline phosphatase (ALP), Total bilirubin and direct bilirubin values. Urinalysis revealed specific gravity of 1.017, proteinuria and bilirubinuria. The case was suspected for as Leptospirosis. Further confirmation was done by Microscopic Agglutination Test (MAT), which revealed 1:800 titre of *L. canicola* and 1: 800 *L. Pyrogens*. The horse was treated with Inj. Amoxycillin @ 22 mg/kg for every 12 hours for 6 days, Inj. RL @ 15 ml/kg b.wt and liv 52 @ 2 bolus / day PO. After 6 days of treatment, the horse was treated with Inj. Benzathine penicillin @ 20000IU/kg IM for 3 days to prevent the carrier status. The horse recovered well clinically and was put to regular work.

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### Introduction

Leptospirosis is a widespread zoonotic baffling disease caused by pathogenic *Leptospira interrogans* spirochetes. The infectious agent is capable of infecting man and animals. *Leptospira* gain entry to the host via per cutaneous route and following an incubation period, leptospiroemia may develop. The disseminated leptospire can replicate in many tissues but are eventually cleared from most tissues by the development of antibody. In some cases, infection may persist for long period of time in the kidneys, eyes and uterus and infectious leptospire may be shed intermittently for many months reported by Ellis et al [1]. In horses, leptospirosis was reported in Arora and Baxi [2]. Horses have rarely been reported as being important for the transmission of this agent to other animals and humans (Desvars *et al.*, [3]. In horses, the known to cause a variety of clinical manifestations: acute febrile illness, lethargy, anorexia, renal failure, abortion and

equine recurrent Uveitis Pearce *et al.*,[4] that is a typical manifestation and indicative of leptospirosis.

There is less known about leptospirosis in horses than any domestic animal and this paper reports the incidence and management of hepatic and renal form of equine leptospirosis.

### Case history and observations

An eight year old Kathiawari male horse was brought to the Veterinary Hospital, Clinician Centre, Cuddalore with a history of variable appetite and polyuria voiding dark yellow coloured urine since one week. Clinical examination revealed dull and depressed mentation, icteric and few petechiation of conjunctival mucous membrane, heart rate 45/ mt and temperature 39.5°C. Blood sample was collected from jugular

vein for hematology and serum biochemistry was analysed using Auto haemoanalyser (BC2800-VET) and A15 Biosystems auto analyser. Urinalysis revealed specific

gravity of 1.017, proteinuria and bilirubinuria (SIEMENS, Multistix 10SG) and microscopic examination revealed few epithelial cells.

Table 1. Haemato-biochemical analysis of Leptospirosis infected horse.

S.No	Haematology parameters	Values	Reference Value	Serum Biochemistry	Values	Reference Value
1.	Haemoglobin	10.5 g/dl	11 -19 g/dL	BUN	27.38 mg /dl	10-24 mg.dl
2.	PCV	31.4%	32 - 52 %	Creatinine	2.45 mg/ dl	1.2-1.9 mg.dl
3.	RBC	5.8 lakhs/cmm	6.5-12.5 lakhs/cmm	AST	279 IU/dl	226-366 IU/L
4.	WBC	14000/cmm	5,500-12,500/cmm	ALP	548 IU/dl	143-395 IU/L
5.	Platelets	1.2 lakhs/cmm	1-6 lakhs/cmm	Total bilirubin	2.70 mg/dl	1-2 mg/dl
6.	Blood picture	Leukocytosis and activated platelets		Direct bilirubin	0.66 mg / dl	0-0.4 mg/dl

Confirmative diagnosis was made for leptospirosis with Microscopic Agglutination Test (MAT). Thiermann and Garrett,[5] also opined that MAT is the gold standard test for leptospirosis. The collected urine and blood sample were subjected to Microscopic Agglutination Test. MAT was originally described by Galton *et al.* [6] and modified by Cole *et al.* [7]. For MAT, a battery of twelve pathogenic serovars viz; *Leptospira interrogans serovar Australis*, Autumnalis, Ballum, Canicola, Grippotyphosa, Hardjo, Hebdomadis, Icterohaemorrhagiae, Javanica, Pomona, Pyrogenes and Tarrasovi were used as antigens in the test. The test was carried out in a 96 well U-bottom micro-titre plate. Test sera were diluted to 1:50 in phosphate buffer saline (PBS) to obtain dilution of 1:100. To 25 µl each of the serum dilution, 25 µl of twelve leptospiral antigens was added. Appropriate antigens controls were set with 25 µl of PBS and 25 µl of antigen. Plates were incubated at 37°C for two hours. After incubation the result was read by examining a drop of serum-antigen mixture from each well under dark field microscope. The antibody titre was the highest dilution of serum showing agglutination of 50 per cent or more leptospiral organisms. Reciprocal agglutination titres of greater than or equal to 100 were considered as positive reactions. The serovar reacting at the highest titre was considered to be the infecting serovar. Ambily *et al.*, [8]. This animal showed higher MAT titre for *L. canicola* 1:400 and *L. pyrogenes* 1:800.

The Horse was treated with Inj. Amoxicillin @ 22 mg/kg for every 12 hours for 6 days, Inj. RL @ 15 ml/kg b.wt and liv 52 @ 2 bolus / day PO. After 6 days of treatment, the horse was treated with Inj. Benzathine penicillin @ 20000IU/kg I/M for 3 days to prevent the carrier status.

## Treatment and discussion

The arrival of diagnosis in this case is quite interest in terms of different clinical approaches. Pyrexia, icteric, depression, lethargy and anorexia were the clinical symptoms observed in this animal. These symptoms aid in the differential diagnosis of Equine infectious anemia (EIA), Equine viral arteritis (ERV) and leptospirosis. In serum biochemistry reports that elevated level of blood urea and nitrogen content also by observed and elevated Creatinine indicative of renal involvement. Renal dysfunction due to leptospirosis has been reported infrequently in the horse was reported by Frellstedt and Slovis,[9]. Divers *et al.*, [10] reported that acute renal failure occur following leptospiral infection. It helps us to think about either leptospirosis or equine infectious anemia which is a vector borne infection. Likewise, elevated alkaline phosphatase and total and direct bilirubin indicates the hepatic origin of problems, which denotes leptospirosis, equine infectious anemia or equine viral arteritis. But in this case having both renal and hepatic involvement of disease, which suggest either leptospirosis or equine infectious anemia. In haematology analysis all parameters are normal except leukocytosis with activated platelets. opined that in equine infectious anemia there is leukopenia with decreased platelets. Urinalysis shows proteinuria, pyuria, and often microscopic hematuria which was also reported by Ahmad *et al.*,[11]. In this case the specific gravity of the urine was 1.025, lower than normal denoting still some functioning renal tissues are present in this case which favor about chronic form of interstitial nephritis. The confirmative diagnosis was made with MAT with titre value of which revealed 1:400 titres of *L. canicola* and 1: 800 & *L. Pyrogenes*. *L.canicola* is a maintenance serovar of dogs is more pathogenic for equines to be an incidental host.

Verma *et al.*, [12] stated that Streptomycin (10 mg/kg) and/or penicillin (10,000-15,000 IU/kg) is the drug of choice for equine leptospirosis. Treatment for acute renal failure was commenced with intravenous administration of physiological saline solution (6 ml/kg bwt/h for 6 days 15 Frellstedt and Slovis [9]. After a good recovery of response, for carrier removal Benzathine penicillin was used @ 20000IU/kg I/M for 3 days and the horse showed an uneventful recovery.

## Conclusion

The occurrences of equine leptospirosis is rare and are often missed during diagnosis. Further, management of the condition is also challengeable task. The medical management in this case may provide baseline values for veterinarians to efficiently handle such cases. Prevention efforts against leptospirosis have focused primarily on the vaccination of domestic animals, both livestock and pets. The control of rodents in urban and rural areas can decrease environmental contamination and the risk of transmission to susceptible hosts. More strict prevention protocol and rodent management is necessary to articulate control strategies.

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