

THERAPEUTIC MANAGEMENT OF HAEMORRHAGIC CYSTITIS IN A HORSE

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SUMMARY

Primary cystitis seems to be rare in horses, although the true incidence is unknown. A five years old non-descript male horse was presented to OPD, RVP, IVRI with the complaint of passing blood tinged urine for past 3 days along with reduced feed intake. On clinical examination, the horse appeared dull with congested mucus membrane of eye and other vital parameters were inconclusive. Ultra scan study revealed distended urinary bladder with large quantities of floating particulates in the urine. Microscopic examination of urine showed triple phosphate crystal and culture examination revealed growth of *Staphylococcus hemolyticus* (>10000 CFU/ml). Cystitis was diagnosed based on the clinical findings. Treatment was initiated with hemocoagulase, enrofloxacin, flunixinmeglumine, furosemide, tetanus toxoid and crystalloids. Urinary bladder flushing was done with metronidazole. The horse showed clinical and hematological improvement after 5th day of treatment and recovered uneventfully at the end of treatment regime.

Keywords: Hemorrhagic cystitis, Horse, *Staphylococcus hemolyticus*, Triple phosphate crystals

Primary cystitis is a rare phenomenon in horse. In horses, cystitis is often reported as secondary to anatomical and physiologic disorders such as congenital abnormalities, spinal cord disease, urolithiasis, bladder paralysis, tumor andiatrogenic trauma which results in abnormal emptying of the bladder (Ramiro, 2007, Gore *et al.*, 2008) or sometimes in response to administration of drugs like cyclophosphamide and phenylbutazone (Aleman *et al.*, 2011). Although the exact pathogenesis remains unclear, viral pathogens, toxin ingestion and environmental stressors may also be act as possible etiologies behind the syndrome (Morgan *et al.*, 1990; Goehring *et al.*, 2010). Repeated urinary catheterization for diagnostic or therapeutic purpose is also an important risk factor for cystitis (Schumacher *et al.*, 2002). Horses grazing on pastures dominated with sorghum, Sudan grass, or sorghum-Sudan hybrid grass may also develop cystitis (Schmitz, 2007). Cystitis is more commonly noticed in mare than the stallion, and ascending infections from urinary tract and/or reproductive tract are the main causes for higher incidence in mare (Reed *et al.*, 2004). Clinical evidences of cystitis are excessive urination, haematuria, dribbling of urine or urine scalding of the perineum. Diagnosis of cystitis can be made through physical examination, urinalysis, urine culture, transrectal palpation, cystoscopy and ultrasonography (Sprayberry, 2004).

A five years old non-descript male horse was presented to OPD, Referral Veterinary Polyclinic, Indian Veterinary Research Institute (IVRI) with the complaint of passing large blood clots in urine for past 3 days, inappetance with normal defecation and previously treated for same but there was no clinical recovery. On clinical examination, the horse appeared dull, depressed, heart rate of 32 beats/

min, respiration rate of 13 breaths/min, rectal temperature of 100.2 °F and congested conjunctival mucus membranes. It passed blood tinged urine (Fig. 1a) which was collected aseptically for urinalysis and culture examination. Whole blood and serum samples were collected for routine haemato-biochemical examination.

Horse was tentatively diagnosed to be suffering from either urolithiasis, bladder neoplasia or lower urinary tract infection based on anamnesis, clinical signs and pathology. Haemoprotozoa diseases were excluded from the differential diagnosis by peripheral blood smear examination which was found to be negative for any haemoparasites. Hematological changes were not much conclusive. Ultrasound scan study revealed few organized contents appearing like soft tissues (probably clots) and wall of bladder was (Fig. 1b) of normal thickness (1.5mm). Corrugation was evident on the left dorsal wall. Triple phosphate crystals along with RBC, WBC and bacteria were noticed in the microscopic examination of urine. Routine urine culture on blood agar (Blood agar base with 5% defibrinated sheep blood) showed pure growth of Gram positive, oxidase negative and catalase positive haemolytic colonies (>10,000/ ml of urine). Three isolated colonies were picked and characterized using growth and biochemical characteristics (Singh, 2009) and were identified as *Staphylococcus haemolyticus*. Antimicrobial sensitivity assay done as per standard protocol (Singh, 2013) on Mueller Hinton agar using commercial antibiotic discs (BBL difco, USA) revealed zone of inhibition of nitrofurantoin, ciprofloxacin, chloramphenicol, meropenem and imipenem as 20, 23, 26, 25 and 24 mm, respectively. Finally, it was tentatively diagnosed as a case of cystitis.

The horse was treated with haemocoagulase 1ml

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Fig. 1. (a) Macroscopic blood clot in urine; (b) Blood clot on bladder wall; (c) Difference in the colour of urine after treatment

(total dose) IM, enrofloxacin @ 5 mg/Kg IV, flunixinmeoglumine @ 1.1 mg/Kg IV, furosemide @ 2 mg/Kg SC, tetanus toxoid 5 ml (total dose) IM and fluid therapy with NS and RL (2 liters each). Urinary bladder flushing was done by urethral catheterization using a PVC catheter under aseptic condition. Bladder was flushed with one litre of normal saline followed by 500 ml of 0.5% metronidazole. On 3rd day of treatment, there was mild improvement but, still bleeding was there. Inj. haemocoagulase was replaced with ethamsylate and rest of the same medication was administered for another 2 days. On 5th day, bleeding stopped completely (Fig. 1c) and the horse was returned to normal appetite. The owner was advised to continue the antibiotic treatment for another 7 days. Culture found negative for *S. hemolyticus* after therapy.

In horses, urolith formation often accompany with cystitis. Older age horses especially mares are highly susceptible for cystitis. Equine species excretes urine with high mineral content, especially calcium carbonate (Diaz-Espineira et al., 1997). Hematuria and stranguria in horse occurs due to idiopathic hemorrhagic cystitis. Urine examination revealed triple phosphate crystals in this case. Ultrasonographic examination helps in differentiating hemorrhagic cystitis from bladder tumor. After completion of therapy, thickness of bladder wall was normal and there was absence of any corrugation and concretion. Selection of appropriate antibacterial agent by urine culture and subsequent sensitivity is of paramount important. The most commonly isolated bacteria from horses with ascending cystitis are *E. coli*, *Proteus*, *Klebsiella*, *Corynebacterium*, *Staphylococcus*, *Streptococcus* and *Pseudomonas* (Schott, 2004). Horse with cystitis should be treated with antimicrobial agents those are excreted high concentration in urine such as penicillin, gentamicin, amikacin, enrofloxacin, or potentiated sulpha (Schumacher et al., 2002). *Staphylococcus haemolyticus*

is a member of coagulase-negative staphylococci, a common cause of uncomplicated urinary tract infections especially in young sexually active females. In India, *S. haemolyticus* has been shown to cause >5% cases of urinary tract infections in humans (Singh, 2019a) and animals (Singh, 2019b). Because of the high antibiotic-resistant phenotype and ability to form biofilms, it is difficult to treat *S. hemolyticus* infection (Singh, 2019b). In the present case, systemic enrofloxacin and bladder flushing with metronidazole gradually reduced bacterial load. Effectiveness of enrofloxacin for the treatment of cystitis has also been reported by several workers (West, 1997; Traxer et al., 2001).

In conclusion, the present report communicates the successful therapeutic management of haemorrhagic cystitis owing to *Staphylococcus hemolyticus* using fluoroquinolone antimicrobial and ancillary therapy.

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