

Rare report of orchitis in a bull due to *Trypanosoma evansi* infection

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Abstract A 9 years old bull was presented to the hospital with a history of scrotal swelling for a period of 12 days and progressive emaciation with intermittent fever. Clinical examination revealed the swollen and painful scrotum with fluid thrill, mild abduction and disorientation of hindlimbs were noticed. Ultrasonography of the testes revealed the anechoic fluid in between the visceral and parietal layers of tunica vaginalis of testis with variation in the echogenicity of the testes. Stained peripheral blood smear examination revealed the presence of *Trypanosoma evansi* organisms. The bull was administered with diminazene aceturate, enrofloxacin, flunixin meglumine, multivitamin injections and dextrose normal saline. Uneventful recovery was noticed following the therapy.

Keywords Bull · *Trypanosoma evansi* · Orchitis · Ultrasonography

Introduction

Trypanosoma evansi is one of the most pathogenic trypanosomes in the world causing disease known as “surra” in animals. It causes a serious, often fatal disease in domestic as well as pet animals. Development of the

clinical signs varies with the type of host and depends on the host’s immunity and stress levels (Sivajothi and Reddy 2018). Commonly reported clinicopathological findings are anaemia, intermittent fever and corneal opacity. In a few animals, reduction in the working ability and reproductive performance is associated with the reduction in serum thyroxin levels (Reddy et al. 2016). Literature is available on the development of the testicular lesions in *T. evansi* infected experimental animals but, orchitis due to natural *T. evansi* infected bulls was limited (Shehu et al. 2006). Hence present communication put the record on orchitis in a bull due to *T. evansi* infection.

Case history and observations

A 9 years old bull was presented to the Veterinary Clinical Complex, College of Veterinary Science, Proddatur with the history of swelling of the scrotum for a period of 12 days and progressive emaciation with intermittent fever. Clinical examination revealed the disorientation of hind limb with mild abduction and fluid thrill and pain while palpation of the scrotum (Fig. 1), rectal temperature 103.2 °F, heart rate 88/min and respiratory rate 32/min. Whole blood with an addition of EDTA, serum and peripheral blood smear were collected for laboratory analysis. Trans-scrotal ultrasonography was carried out to assess the abnormalities related to the testes in accordance with the previous studies (Reddy et al. 2018).

Stained peripheral blood smear examination revealed the presence of the *Trypanosoma evansi* organisms (Fig. 2). Haemato-biochemical findings revealed reduced packed cell volume (28%), haemoglobin (9.2 g/dL), total erythrocyte count ($4.1 \times 10^6/\mu\text{L}$) and total leucocyte count (10,660/ μL) with neutrophilia (54%). Serum analysis

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Fig. 1 Testicular enlargement

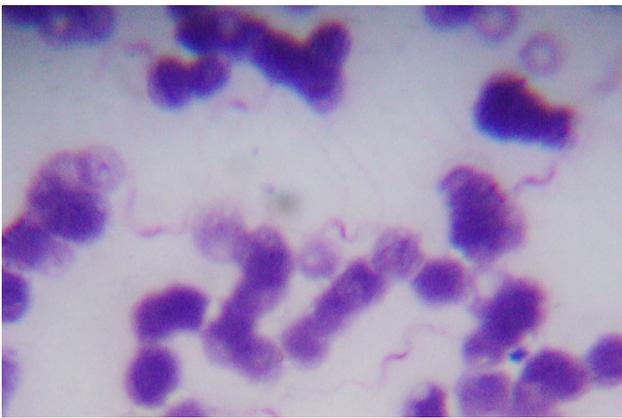


Fig. 2 Microscopic examination of the stained blood smears—presence of *Trypanosoma evansi* organisms ($\times 1000$)

revealed total protein (6.81 g/dL), albumin (2.88 g/dL), calcium (8.89 mg/dL), inorganic phosphorus (4.12 mg/dL), creatinine (2.11 mg/dL) and blood urea nitrogen (48.65 mg/dL) levels. Serum sample was negative for brucellosis. Ultrasonography of the testes revealed the presence of anechoic fluid in between the visceral and parietal layers of tunica vaginalis of testis and variations in the echogenicity of the two testes (Fig. 3). Ultrasonographic guidance fine needle aspiration of the scrotal contents revealed the presence of the serous fluid and microscopic examination revealed the presence of mature and immature neutrophils. Bull in the present study owned by the former and study was carried out with the full consent and cooperation of the owner. The present study was carried out on the clinical case presented to the hospital so, approval of the institutional animal ethical committee is not required.



Fig. 3 Scrotal ultrasonography—clear anechoic fluid with different echogenicity of the testes

Treatment and discussion

The bull was administered with inj. diminazene aceturate (7 mg/kg body weight, QD, IM, 3 days) (Jatau et al. 2010), inj. enrofloxacin (10 mg/kg body weight, QD, IV, 21 days), inj. flunixin meglumine (1.1 mg/kg body weight, QD, IM 3 days), multivitamin injections, boli containing live yeast culture, 5% dextrose normal saline (10 ml/kg body weight) as supportive therapy. Improvement in the scrotum was noticed by the third day of post-therapy and recurrence was not reported up to the 18 months of observatory period.

The bull was free from brucellosis, no history of testicular trauma, presence of the scrotal serous fluid and emaciation with intermittent fever indicative of orchitis due to chronic *Trypanosoma evansi* infection. Recorded haemato-biochemical findings were in agreement with the previous reports (Sivajothi et al. 2014). Inflammation of the testes is due to primary or secondary causes. Orchitis leads to severe discomfort for the bulls which will have an effect on the reproduction and working ability. In the present study, scrotum and the scrotal contents were assessed by the ultrasonography examination in accordance with the Reddy et al. (2018) who advised ultrasonography is one of the diagnostic procedures for assessment of the internal structures of the scrotum. In mature bulls accumulation of fluid within the scrotal vaginal cavity due to local inflammation or traumatic lesions and without any evidence of above. During ultrasonography, accumulated fluid is in the scrotal vaginal cavity is serous in nature it may appear as anechoic and it is in purulent it will have mixed echogenicity and in chronic cases, it becomes as fibrinous in nature and appeared as hyperechogenic in nature. During the early stages of orchitis, inflammation process of the

testes due to invasion by trypanosomes, which further results in enlargement of the scrotal size and development of the abnormal vital signs. But, during the chronic infection, it leads to inflammatory changes in testes which further cause decrease in scrotal circumference and atrophy of testicles. Variation in the echogenicity of the testes in the present study supported by Okubanjo et al. (2014) who reported the variation of the size of testes in rams infected with *Trypanosoma congolense*. During the pathogenesis, degenerative changes in the testes, delayed puberty further leads to loss of libido was reported in trypanosomiasis. According to Wada et al. (2016) direct trypanosomal damage and pathological changes in the testis are responsible for the aspermia in *Trypanosoma evansi* infected male goats. During the *T. vivax* infection it causes testicular and epididymal lesions and leads to development of the infertility and sterility in animals chronically affected with *T. vivax* (Sekoni et al. 2004). In camels, *T. evansi* causes the elevation of the estradiol levels and reduction in the levels of testosterone levels which further leads to production of abnormal sperm (Al-Qarawi et al. 2004). *T. evansi* causes degeneration of the seminiferous tubules and spermatids, testicular atrophy, decrease of epididymal sperm reserves and severe testicular degeneration (Shehu et al. 2006). *T. evansi* does not cause fatal disease in cattle but, in the present study, orchitis was developed due to chronic *T. evansi* infection. Present study findings were supported by the similar testicular abnormality findings in the *T. evansi* infected rams, camels and in experimental studies in laboratory animals (Al-Qarawi et al. 2004; Shehu et al. 2006; Wada et al. 2016).

Conclusion

In conclusion, the present study puts the record on the development of the orchitis due to *Trypanosoma evansi* infection and its successful management in a bull.

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Author's contribution Both the authors had equal role for the study. S. Sivajothi diagnosed the case as suffering from *Trypanosoma evansi* and prepared the manuscript for submission. B. Sudhakara Reddy has done the ultrasonography and edited the manuscript.

Compliance with ethical standards

Conflict of interest Both the authors have no conflict of interest regarding publication of the article.

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