INCIDENCE OF TRYPANOSOMOSIS IN BUFFALOES IN INDORE AND RATLAM DISTRICTS OF MADHYA PRADESH

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ABSTRACT

The present study was undertaken to record the Incidence of trypanosomosis in buffaloes screened in and around Indore and Ratlam districts of Madhya Pradesh. The result indicate overall incidence 14.8 per cent while incidence in Indore and Ratlam districts were 12.8 per cent and 16.8 per cent respectively. Adult buffaloes > 4 years of age exhibited highest incidence followed by > 2-4 years of age and least incidence was recorded in calves of 0-2 years of age. Highest incidence of trypanosomosis was recorded in females than in males in Indore and Ratlam districts as 14.42 per cent and 20.65 per cent, respectively. Highest incidence of trypanosomosis in buffaloes was found in summer followed by monsoon and least in winter in Indore district while in Ratlam district highest incidence was found in Monsoon followed by summer and winter season.

Key words: Incidence, trypanosomosis, buffaloes

Introduction

Trypanosomosis commonly known as "Surra" caused by *Trypanosoma evansi* is most widely distributed in Asia, Africa and Central and South America affecting domesticated livestock (Konnai *et al*., 2009). *T. evansi* being the most commonly occurring species of trypanosomes. This chronic disease caused by the first pathogenic trypanosome *T. evansi* was identified by Griffith Evans in 1880 from the blood of Indian horses and camels. India has the distinction of being the country where the first two mammalian trypanosomes i.e. *T. lewisi* and *T. evansi* were discovered and *T. evansi* being the most commonly occurring species of trypanosomes (Singh and Singla, 2014). Trypanosomosis is manifested by pyrexia, directly associated with parasitaemia, together with progressive anaemia, loss of condition and lassitude. Vectors involved in the spread of disease are Muscoid and Tabanid biting flies. The disease is underestimated in buffaloes due to cryptic nature. Moreover there is no pathognomonic clinical sign of Surra, resulted into inadequate information on epidemiology and subsequently inaccurate data about magnitude of the disease in the country, making monitoring and strategic control planning difficult (Aulakh, 2003). Total economic losses due to Surra is INR 9,872.33 per lactation in buffaloes (Singh *et al.,* 2014*)*. It clearly depicts that losses due to Surra is the highest among important diseases of livestock.

Materials and Methods

Animals: A total 250 buffaloes were screened (125 animals from each district) and clinically examined with special attention to signs related to trypansoma infection in and around Indore and Ratlam district.

Samples: Blood samples from 250 buffaloes from different places of Indore and Ratlam district of M.P. were collected aseptically from jugular and ear vein by sterile sharp needle in clean and dry test tube and kept in vial with anticoagulant (EDTA 2 mg per ml of blood) and were brought to the Department of Veterinary Medicine, College of Veterinary Science and A.H. Mhow for examination.

Diagnosis: Various conventional parasitological methods like wet blood film, Giemsa stained thick and thin blood smear and buffy coat technique (Plate 1) of Rathore and Sengar (2005) were followed for diagnosis of trypanosoma infection in buffaloes. The incidence rate of trypanosomosis was calculated based on blood sample examination.

Risk Factors: To study the effect of age and sex on trypanosomosis in animals, the animals were grouped into their age groups 0-2, > 2-4 and > 4 years and two groups male and female, respectively. Similarly based on seasons, animals were sub divided into summer, monsoon and winter respectively. Information related to age, sex and season were recorded and incidence was calculated age, sex and season wise.

Result and Discussion

Overall incidence was found 14.8 per cent while incidence in Indore and Ratlam districts were 12.8 per cent and 16.8 per cent respectively. These findings are in close agreement with many researchers had reported that buffaloes have higher incidence rate of trypanosome infections such as Jaiswal *et al.* (2015) and Migri *et al.* (2016). This might be due to the reason that buffaloes act as reservoir most frequently (Table 1; Fig. 1)

Age wise incidence in Indore district: A total of 125 samples of buffaloes were examined, the highest incidence was found in adults age (> 4 years) as 23.4 per cent, followed by age group > 2-4 years (10 per cent) and lowest in calves (0-2 years) as 2.63 per cent in Indore district (Table 2; Fig. 2) and in Ratlam district the highest incidence was found in adults age (> 4 years) as 23.64 per cent, followed by in > 2-4 years of age as 20.59 per cent and lowest in calves (0-2 years) as 2.78 per cent (Table 2; Fig. 3). The present study revealed that when the age increased, the incidence rate also

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Plate 1: Photomicrograph showing *T. evansi* in BCT under oil imersion

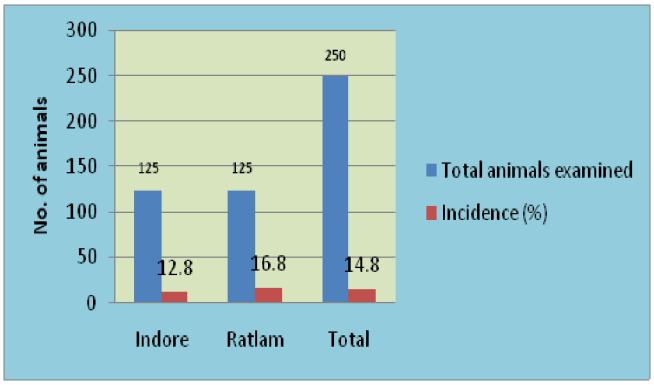

Fig. 1: Incidence of trypanosomosis in buffaloes in Indore and Ratlam district

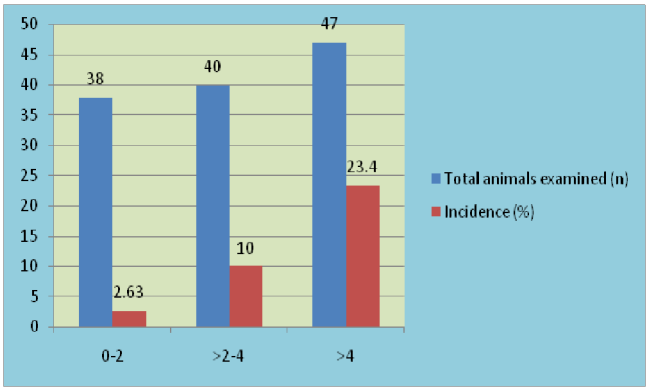

Fig. 2: Age wise incidence of trypanosomosis in buffaloes in Indore

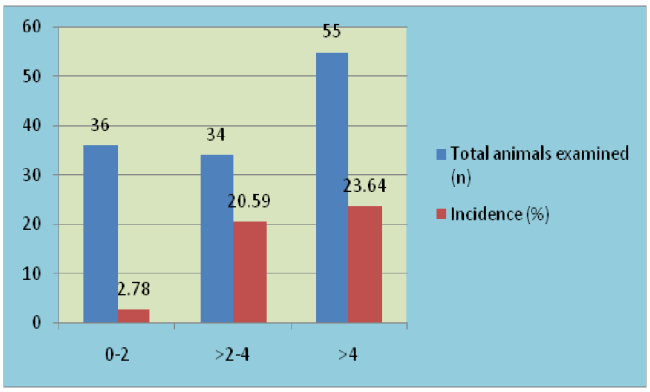

Fig. 3: Age wise incidence of trypanosomosis in buffaloes in Ratlam

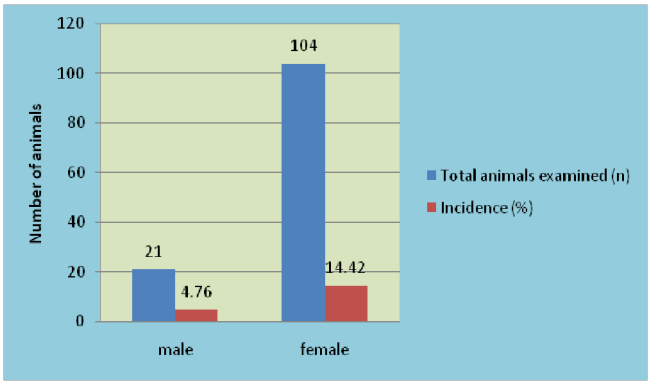

Fig. 4: Sex wise incidence of trypanosomosis in buffaloes in Indore

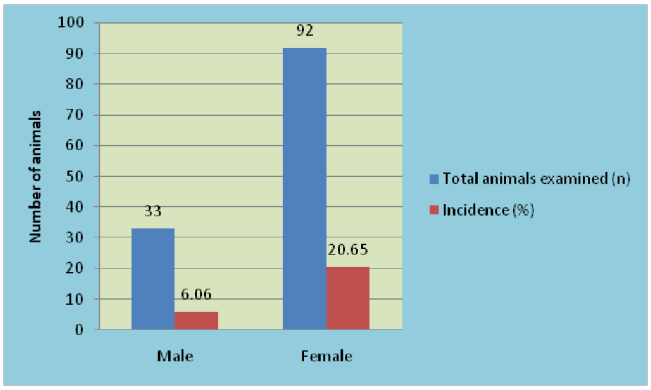

Fig. 5: Sex wise incidence of trypanosomosis in buffaloes in Ratlam

increased. This may be due to the immune compromization in very old individuals. Our observations correlate with the results of previous studies on incidence of haemoprotozoan parasites in bovines and which is in agreement with Singla *et al.* (2013); Rani *et al.* (2015) and Benalfew *et al.* (2016).

Sex wise incidence: Out of total 125 samples examined higher incidence in female animals (14.42 per cent) was recorded as compared to male (4.76 per cent) animals in Indore district (Table 3; Fig. 4) and similarly in Ratlam district higher incidence in female animals (20.65 per cent) was recorded as compared to male (6.06 per cent) animals (Table 3; Fig. 5). These results are in agreement with the Das *et al.* (1998) and Solanki, (2016). Higher incidence in female population may be due to hormonal disturbances which pretence it to weakened immune system (Maharana *et al.* 2015). This variation of infection rates was recorded between females and males in the present study may be attributed to the stress of lactations and successive pregnancy.

Season wise incidence: Out of total 125 samples, the seasonal incidence was studied and the highest incidence were recorded as 5.6 per cent in summer season followed by rainy season 4.8 per cent and lowest in winter season i.e. 2.4 per cent in Indore district (Table 4; Fig. 6) same results were described by Mamoudou *et al.* (2016) and Solanki, (2017), while in Ratlam district (Table 4; Fig. 7) the highest incidence was recorded as 8.8 per cent in monsoon season followed by summer 6.4 per cent and lowest in winter season i.e. 1.6 per cent these are in favour with the results of Agrawal *et al.* (2013) and Muraleedharan, (2015). Most of the animals suffering during summer and monsoon months might be due

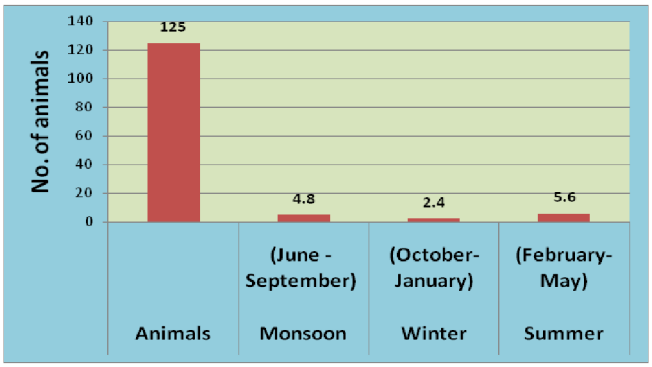

Fig. 6: Season wise incidence of trypanosomosis in buffaloes in Indore (n=125)

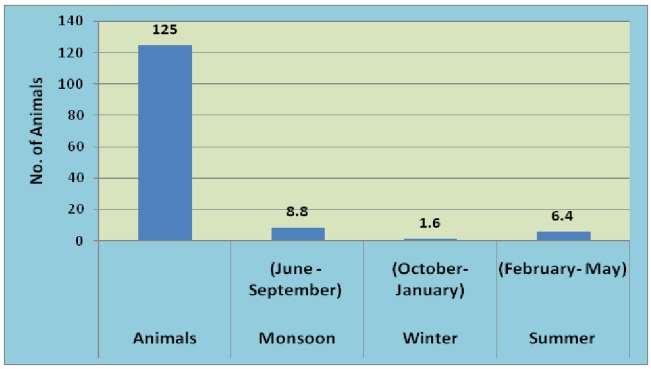

Fig. 7: Season wise incidence of trypanosomosis in buffaloes in Ratlam (n=125)

Table 1: Incidence of trypanosomosis in buffaloes in Indore and Ratlam districts

District	Total animals		Incidence (%)
	Examined	Positive Cases	
Indore	125	16	12.8
Ratlam	125	21	16.8
Total	250	37	14.8

Table 2: Age wise incidence of trypanosomosis in buffaloes in Indore and Ratlam districts.

Age in years	Total animals Examined		Positive cases		Incidence	
	Indore	Ratlam	Indore	Ratlam	Indore	Ratlam
0-2	38	36	1	1	2.63	2.78
>2-4	40	34	4	7	10	20.59
>4	47	55	11	13	23.4	23.64

Table 3: Sex wise incidence of trypanosomosis in buffaloes in Indore and Ratlam districts

Sex	Total animals Examined		Positive cases		Incidence	
	Indore	Ratlam	Indore	Ratlam	Indore	Ratlam
Male	21	33	1	2	4.76	6.06
Female	104	92	15	19	14.42	20.65

Table 4: Season wise incidence of trypanosomosis in buffaloes in Indore and Ratlam districts

Season	Total animals Examined		Positive cases		Incidence	
	Indore	Ratlam	Indore	Ratlam	Indore	Ratlam
Monsoon (June - September)	125	125	6	11	4.8	8.8
Winter (October-January)	125	125	3	2	2.4	1.6
Summer (February-May)	125	125	7	8	5.6	6.4

to high abundance of vectors in these seasons of the year (Maharana *et al.*, 2015). The disease is seasonal and the incidence is higher during rainy and post rainy seasons due to preponderance of *Tabanus* flies.

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References

Agrawal V, Das G and Nath S (2013) Incidence of *Trypanosoma evansi* in cross breed cattle in Indore, Madhya Pradesh. *Environm. Ecol.* **31**(4): 1635-1637.

Aulakh GS (2003). Haemato-biochemical and therapeutic studies on haemoprotists in bovines. M.V. Sc., Thesis, Punjab Agricultural University, Ludhiana, India.

Benalfew E, Tilahun A, Berhanu A, Teshale A and Getachew A (2016). A study on cattle trypanosomosis and its vectors in Gimbo and Guraferda districts of Southwest Ethiopia. *J. Vet. Med. Anim. Health*. **8**(9): 112-119.

Das AK, Nandi NC and Mohankumar OR (1998) Prevalence of bovine surra in Guntur district, Andhra Pradesh. *Ind. Vet. J.* **75**(6): 526-529.

Jaiswal AK, Sudan V, Neha and Verma AK (2015) Insight into trypanosomiasis in animals: various approaches for its diagnosis, treatment and control: a review. *Asian J. Anim. Sci.* **9**(5): 172-186.

Konnai S, Mekata H, Mingala CN, Abes NS, Gutierrez CA, Herrera JRV, Dargantes AP, Witola WH, Cruz LC, Inoue N and Onuma M (2009) Development and application of a quantitative real-time PCR for the diagnosis of Surra in water buffaloes. *Inf. Genetics Evolution*. **9**(4): 449-452.

Maharana BR, Kumar B, Prasad A, Patbandha TK, Sudhakar NR, Joseph JP and Patel BR (2015) Prevalence and assessment of risk factors for haemoprotozoan infection in cattle and buffaloes of south west Gujarat, India. *Ind. J. Anim. Res*. **50**(5): 733-739.

Mamoudou A, Njanloga A, Hayatou A, Suh PF and Achukwi MD (2016) Animal trypanosomosis in clinically healthy cattle of north Cameroon: epidemiological implications. *Parasites Vectors*. **9**: 206.

Migri S, Bharkad GP and Gatne ML (2016) Prevalence of clinical and subclinical form of trypanosome evansi infection in buffaloes of Mumbai region (MS) of India. *Buffalo Bulletin*. **35**(4): 679-685.

Muraleedharan K (2015) An Update on Trypanosoma Infection in Livestock of Karnataka State, *Ind. Vet. Research Int.* **3**(3): 46-54.

Rani NL, Suresh K and Rajesh K (2015) A retrospective study on clinico-epidemiological aspects of trypanosomiasis in buffaloes. *Int. J. Vet. Sci.* **4**(2): 97-100.

Rathore VS and Sengar YS (2005) Diagnostic Parasitology, Pointer Publishers, Jaipur, pp. 75-79.

Singh SK, Sudan V, Singh AP and Yadav BK (2014) Evaluation of clinical markers for diagnosis of bovine theileriosis- a study of 21 calves. *Intas Polivet*. **15**(1): 91-95.

Singh V and Singla LD (2013) Trypanosomosis (Surra) in Livestock. *Research Gate*. pp. 305-330.

Singla LD, Sharma A, Kaur P, Tuli A, Bhat SA and Bal MS (2013). Bovine trypanosomosis in Punjab: assessment of seroprevalence by CATT/ *T. evansi. Int. J. Adv. Research*. 1(9): 364-371.

Solanki A (2016). Epidemiology of haemoprptozoan infections and economical losses in buffaloes. M.V.Sc. Thesis (Medicine). Nanaji Deshmukh Veterinary Science University, Jabalpur.