



## Case Report

### A Retrospective Study on Clinico-Epidemiological Aspects of Trypanosomiasis in Buffaloes

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#### ABSTRACT

A study was carried out to determine the prevalence of trypanosomiasis in buffaloes in Krishna district, Andhra Pradesh, Gannavaram from January 2002 to December 2011. The prevalence of trypanosomiasis was 9.35% with more prevalence in rainy season (46.92%). The major symptoms manifested were drop in milk yield, fever reduced appetite corneal opacity, lacrymation, urticaria, circling, shivering, stiff gait, emaciation, anemia, epistaxis and abortion. About 88.07 per cent (827/939) of the affected buffaloes revealed reduction in milk yield.

**Key words:** Abortion, Milk yield, T. Evansi, Trypanosomiasis

#### INTRODUCTION

Trypanosomiasis is a disabling and debilitating tropical disease of domestic animals caused by flagellate haemoparasite of the genus *Trypanosoma*. Trypanosomiasis in buffaloes was first recorded in India by Lingard (1897) and has been recognized as a disease of great economic importance. However the incidence of trypanosomiasis in cattle and buffaloes in India has been underestimated because the infection in them was usually subclinical and buffaloes may act as reservoirs. The infection usually becomes patent and clinical when the animals are exposed to various stress conditions like hard work, transportation, inclement weather, malnutrition and other concurrent infections.

Trypanosomiasis in buffaloes has a significant impact on the economics of the dairy farmers. Trypanosomiasis directly constrains the productivity of cattle by reducing birth rates, increasing abortion rates and increasing mortality rates (Mersha *et al.*, 2013). The acute disease in bovine is characterized by high fever, emaciation, lacrymation, reduced milk yield, corneal opacity, nervous signs and death may occur within 24 hours of onset of clinical signs. Chronic surra can lead to loss of body condition with impaired reproductive performance (Radostits *et al.*, 2007). The indirect losses due to infection are poorly defined, but remained an important factor in the field due to failure to vaccinate against bacterial and viral infections, which in turn lead to severe immune-suppression produced by the disease (Holmes, 1980).

Trypanosomes are mechanically transmitted by blood sucking flies chiefly *Tabanus striatus*, *Stomoxys calcitrans*, *Haematobia irritans* and *Lyperosia* species. The parasite in the vector survives for a very brief period and therefore Tabanid flies form the most suitable for transmission from one host to other due to their interrupted feeding habit.

Bovine trypanosomiasis is a pertinent problem and the incidence is more in coastal districts of Andhra Pradesh especially in buffaloes. The disease is almost endemic in various parts of coastal Andhra Pradesh and may flare up during fly breeding season (Bhaskara Rao and Hafeez, 2005). It is difficult to assess the economic losses due to non availability of epidemiological data, misdiagnosis and poor monitoring.

The purpose of this study was to investigate the prevalence and clinical manifestations of trypanosomiasis infected naturally prevailing in and around Gannavaram, Krishna District, Andhra Pradesh, India.

#### MATERIALS AND METHODS

The prevalence of trypanosomiasis in buffaloes, presented to the Teaching Veterinary Clinical Complex, Gannavaram was studied from January 2002 to December 2011. A total of 12,314 buffaloes of different age groups were screened for trypanosomes. The positive cases recorded during the above period were further analyzed in relation to age, season and to provide detailed information on the symptomatology of the disease. The presence of trypanosomiasis in buffaloes was ascertained by direct microscopic examination of wet blood films. For this a

drop of blood was collected from the ear vein of suspected animals on a clean grease free glass slide and covered with an 18x18 mm thin cover glass and examined under light microscope. The trypanosomes were seen moving actively in positive cases (Bidyashankar *et al.*, 2005). The trypanosome species was identified as *T. evansi* on examination of Giemsa stained smears based on morphology. The buffaloes were subjected to general clinical examination in relation to history, signalment and clinical signs. The detailed history of the buffaloes under investigation was collected from the owners and recorded in the prescribed format for analysis.

## RESULTS

Out of 12,314 blood samples examined 1151 (9.35%) were found positive for trypanosomes. The year wise prevalence varied from 2.96% to 22.11% with higher prevalence in the year 2003. Out of infected buffaloes, 1023 (88.88%) were adults (> 3 year) followed by 114 (9.90%) heifers (1-3 years) and 14 (1.22%) were calves (upto 12 months). Higher prevalence was recorded in rainy season (46.92%) followed by winter (36.40%) and less incidence in summer (16.68%). The prevalence of trypanosomiasis according to age, season and year are presented in Tables 1 and 2.

Out of 1151 affected buffaloes, 939 were lactating. The symptoms exhibited by the affected animals are presented in Table 3. The animals exhibited one or more of the recorded symptoms which included drop in milk yield (88.07%), fever (31.01%), reduced appetite (53.52%), corneal opacity (7.56%), lacrymation (18.68%), urticaria (2.35%), circling (1.99%), shivering (18.77%), stiff gait (37.97%), emaciation (4.69%), anemia (4.26%), epistaxis (0.26%), abortion (0.17%) and edema of dependent parts (2.52%).

## DISCUSSION

### Prevalence of the disease

In the present study the prevalence of trypanosomiasis in buffaloes was 9.35% and was in close agreement with the findings of Bhaskara Rao and Hafeez (2005) who reported it to be 7.28%. Laha *et al.* (1989) recorded an incidence of 2.69% in buffaloes of India, while Krishnappa *et al.* (2002) recorded the same in Karnataka as 12.9%. On the contrary Roy *et al.* (2004) recorded a high prevalence (22.03%) of trypanosomiasis in Chattisgarh. However, the prevalence varied with the vector, availability of host and/or climatic conditions (Rajesh kumar *et al.*, 2010).

### Age

The present study revealed that the infection was seen mostly in adult buffaloes (88.88%) followed by heifers (9.90%) and calves (1.22%). Calves and young animals less exposed since they are either tethered or kept close to the homestead where biting fly habitat has been destroyed so the trypanosomes challenge is higher in older animals may be due to biting flies feeding preference for old animals and they are usually driven for grazing and watering. Roy *et al.* (2004) recorded highest prevalence in the age group of 1-3 years (33.54%) followed by 3-6 years

**Table 1:** Age wise Prevalence of trypanosomiasis

Total no of animals screened	Age	No of animals affected	Prevalence %
12314	12 months	14	1.22
	1-3 years	114	9.90
	>3 years	1023	88.88

(23.95%) and opined that the higher incidence in adult buffaloes might be due to the fact that majority of the animals are exposed to ticks and experience the infection.

### Season

Highest prevalence (46.92%) was observed in rainy season, followed by winter (36.40%) and less number of cases was recorded in summer season (16.68%) (Table 2). The seasonal prevalence of the disease was also reported by previous workers (Krisnappa *et al.*, 2002; Agrawal *et al.*, 2003). The infection occurred throughout the year, but month wise prevalence was more in September followed by October and November months. The disease was encountered more after the onset of monsoons due to high prevalence of biting flies from July to November with a peak from August to October (Prasad *et al.*, 1997).

### Clinical symptoms

Majority of the animals which were positive to the infection (88.07%) exhibited marked drop in milk production. Satis *et al.* (1999), Chand *et al.* (2008) and Suman Kumar (2009) also reported sudden drop in milk production. This could be due to hypoglycemia caused by rapid consumption of glucose by the trypanosomes. Krishnappa *et al.* (2002) reported that the reduced milk production was the major economic loss in trypanosome infection.

Anorexia of varying degrees was recorded in 53.52% of animals. Rajesh Kumar *et al.* (2010) and Sivajyothi *et al.* (2011) also reported loss of appetite/anorexia as one of the major clinical sign in buffaloes with Trypanosomiasis. This might be attributed to severe parasitemia and reduced ruminal motility as an effect of hypoglycemia. The other clinical signs observed were presented in Table 3. Similar observations were made by Madhan Mohan *et al.* (2003). High fever was observed in 357 (31.01%) animals was in accordance with the findings of Ramakrishna and Yoganand (2008) who stated that rise in temperature could be due to antigen-antibody reaction while Raina *et al.* (1985) opined that fever was not consistent finding in buffaloes.

Anemia was recorded in 4.26% of affected buffaloes which might be due to increased erythrophagocytosis, hemolysis and dyshemopoiesis (Gill, 1977). Progressive emaciation could be due to prolonged hypoglycemia and reabsorption of body fat from subcutaneous tissues. Development of oedema and was due to hypoproteinemia and anemia. Edema, corneal opacity, convulsions were also reported by Sahu *et al.* (2008). Abortions were recorded in two buffaloes and were in accordance with the findings of Krishnappa *et al.* (2002) and Pathak and Narendra Singh (2005). Nervous symptoms in this study could be attributed to hypoglycemia, inflammatory changes due to cerebral anoxia, effects of toxic end products of protozoal metabolism, occlusion of cerebral vessels by invading protozoa (Ramakrishna and Yoganand, 2008). During the present study period,

**Table 2:** Year and season -wise prevalence of trypanosomiasis

Year	No of animals screened	No of cases positive			Total no of cases found positive	Prevalence %
		Summer	Rainy	Winter		
2002	1167	30	63	48	141	12.08
2003	1307	41	148	100	289	22.11
2004	1424	6	54	36	96	6.74
2005	1339	16	32	20	68	5.07
2006	1407	12	67	74	153	10.87
2007	1432	41	69	51	161	11.24
2009	1239	13	66	53	132	10.65
2010	1206	24	16	18	58	4.81
2011	1793	9	25	19	53	2.96
Total	12314	192 (16.68)	540 (46.92%)	419 (36.40%)	1151	9.35

**Table 3:** Symptomatology observed in buffaloes with trypanosomiasis

Symptom	No.of animals	Percentage
Drop in milk yield	827/939	88.07
Fever	357	31.01
Reduced appetite	616	53.52
Corneal opacity	87	7.56
Lacrymation	215	18.68
Urticaria	27	2.35
Circling	23	1.99
Shivering	216	18.77
Stiff gait	437	37.97
Emaciation	54	4.69
Anemia	49	4.26
Epistaxis	3	0.26
Abortion	2	0.17
Edema of dependent parts	29	2.52

mortality was recorded in four (0.35%) cases which might be due to anemia, hypoglycemia or due to asphyxiation (Pathak and Narendra Singh, 2005). Lodha and Singh (1963) and Gill (1991) also recorded 20 to 90 per cent mortality in an acute form of the disease with prominent nervous symptoms.

### Conclusion

The present study revealed the epidemiological aspects and symptoms in naturally infected trypanosomiasis in buffaloes with significant impact on milk production

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