



Research Article

Epidemiological Survey on Trypanosomiasis in Dromedary Camels of District Tank Khyber Pakhtunkhwa, Pakistan

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Abstract | Trypanosomiasis is a major enzootic disease of the dromedary camel caused by *Trypanosoma evansi* (surra). The present study was conducted in District Tank southern part of Khyber Pakhtunkhwa Pakistan. The objective of this study was to determine the prevalence of camel Trypanosomiasis and to find the comparative infection rate in different age and sex groups of camels. A total of 300 blood samples were used for diagnosis. After analyses, 5.67% (17/300) samples were found positive for *Trypanosoma evansi* using thick and thin blood smears techniques as per method described by (Adam *et al.* 1971). A higher infection rate was found in females (6.67%) as compared to males (4.67%). Highest (9.00%) infection was noted in camels above 4 years of age group followed by (5.00%) in camel under 2 years age group while lowest (3.00%) in 3-4 years age group camels. It was concluded that 5.67% (17/300) samples were found positive for *Trypanosoma evansi* infection. Infection rate was found higher in females (6.67%) than males (4.67%). Highest (9.00%) infection was noted in camels above 4 years of age group.

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Introduction

Trypanosomiasis is one of the most important and pathogenic protozoal disease of camel caused by *Trypanosoma evansi*. The parasite has a widespread range of distribution throughout tropical and sub-tropical regions of the world. *Trypanosoma evansi* was first reported from India, where the word "Surra" is used to describe this disease. *T. evansi* can also cause ailment in other species of animal e.g. horses

cattle, buffaloes, sheep and goats (Lukins, 1992). Trypanosomiasis in camels causes reduced feed and water intake, intermittent fever, progressive weakness, as the disease progresses the hump disappears, rough and dull hair coat with hair loss at the tail. Prominent oedematous swelling under the belly especially in the morning time, pregnant animals may abort and death occurs usually in new-born calves of diseased dams. The camel may live up to four years with sub-clinical infection and some may eliminate the

parasite and eventually recovered (Evans *et al.*, 1995). Trypanosomiasis is one of the important single cause of economic losses in camel rearing regions, causing up to 30.0% morbidity and around 3.0% mortality (Rutter, 1967; Luckins, 1988; Njiru *et al.*, 2002). The objective of the present study was to identify the trypanosomiasis prevalent in camels of District Tank Khyber Pakhtunkhwa Pakistan and to find out the comparative infection rate in different age and sex groups of camels.

Materials and Methods

Study area

The study was conducted in District Tank Southern part of Khyber Pakhtunkhwa Pakistan. A total of 300 camels were used in this study. These camels were separated into three age and sex groups A, B and C each having 100 animals, (150 males and 150 females), as given below:

- Group A: Animals upto 2 years age (male and female)
- Group B: Animals from 3 to 4 years age (male and female)
- Group C: Animals above 4 years age (male and female)

Sample size

A total of 300 blood samples were collected from different villages of District Tank.

Samples collection

Blood samples were collected from jugular vein or ear vein puncture into 5 ml ethylene tetra-acetic acid (EDTA) coated vacutainer tubes (Xinrui Medical Device Co., Ltd China), kept in cool box and transferred immediately to Veterinary Research Centre Tank for processing. Before collection in EDTA tubes (Xinrui Medical Device Co., Ltd China), direct smears were prepared in the field while samples were collected randomly from the animals of the respective area including both the healthy as well as morbid animals, if any.

Sample examination procedures

Thin and thick blood smears were prepared, as per method described by (Adam *et al.*, 1971) and air dried. Dried smears were fixed in absolute methyl alcohol for 2-3 minutes. The slides were immersed in Giemsa's stain for 20-25 minutes. After drying, the slides were examined under microscope (at 100x oil

immersion objective) for detection of *Trypanosoma* species according to their morphological characters.

Results and Discussion

Blood samples from 300 camels, 150 each from male and female were collected and examined for detection and identification of *Trypanosoma* species. During the investigations, *T. evansi* was the only species recognized from the samples of infected camels.

Table 1: The prevalence of *Trypanosoma evansi* in different age and sex groups of camel.

S. No.	Age group	No. of sample examined	No of positive sample	Percentage of positive sample
A.	Upto 2 years			
	Male	50	03	6.00
	Female	50	02	4.00
	Total	100	05	5.00
B.	3-4 Years			
	Male	50	01	2.00
	Female	50	02	4.00
	Total	100	03	3.00
C.	Above 4 years			
	Male	50	03	6.00
	Female	50	06	12.00
	Total	100	09	9.00
Overall				
	Male	150	07	4.67
	Female	150	10	6.67
	Total	300	17	5.67

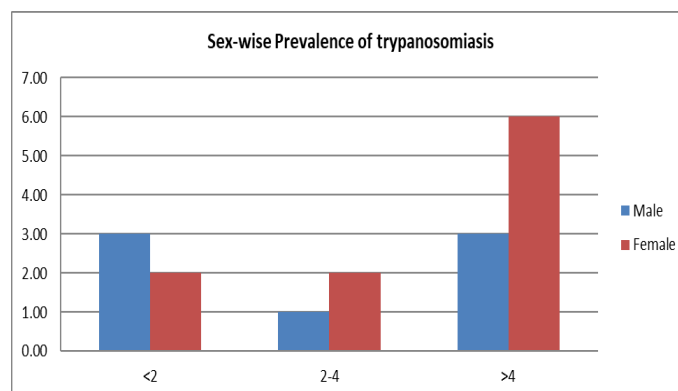


Figure 1: Sex-wise Prevalence of trypanosomiasis.

	Male	Female
<2	3.00	2.00
3-4	1.00	2.00
>4	3.00	6.00

Table 1 shows that out of total 300 samples, only 17 (5.67%) samples were found positive for *Trypanosoma evansi* specie. After analyses, 5.67% (17/300) samples were found positive for *Trypanosoma evansi* using thick and thin blood smears techniques. A higher infection rate was found in females (6.67%) as compared to males (4.67%). Highest (9.00%) infection was noted in camels above 4 years of age group followed by (5.00%) in camel below 2 years age group while lowest (3.00%) in 3-4 years age group camels.

Several studies in Pakistan shown that *Trypanosoma evansi* is endemic in camel population, horses and bears (Murtaz *et al.*, 2006; Muhammad *et al.*, 2007). Table 1 shows that 300 blood samples were used for diagnosis. After analyses, 5.67% (17/300) samples were found positive for *Trypanosoma evansi* using thick and thin blood smears techniques. A higher infection rate was found in females (6.67%) as compared to males (4.67%). Highest (9.00%) infection was noted in camels above 4 years of age group followed by (5.00%) in camel below 2 years age group while lowest (3.00%) in 3-4 years age group camels. Similar study was conducted by Hussain *et al.* (1991) and recorded higher infection rate 13.2% of *Trypanosoma evansi* in camels. Shah *et al.*, 2004 reported that 14 (13.72%) samples were found positive for *Trypanosoma evansi* species out of total 102 collected in Tandojam District of Sindh. A highest infection rate (15.68%) was noted in females, as compared to males 11.76%. The highest prevalence of *Trypanosoma evansi* in blood samples of female camels recorded might be due to stress during pregnancy and lactation decreased resistance in female and render them more predisposed to Trypanosomiasis. Female above four years age shows a higher infection rate (23.52%) while second higher infection (17.64%) noted was in very young age group camels of under 2 years. Lower infection rate (5.88%) was recorded in middle age groups of camels of both genders. In male camels, the higher prevalence recorded was 17.64% in those above 4 years of age. The higher prevalence in old camels at this stage might be due to heavy stress through their use for transportation of goods from one place to another and secondly may be due to poor management. Similar results were also recorded for female camels. However, Pathak and Khanna (1995) reported that all camels were equally susceptible to trypanosome infection regardless of breed and age. Hassan *et al.* (2006) conducted study in Punjab province of Pakistan and recorded prevalence of surra

in camels in the Punjab region ranged between 3.3% and 4%.

The prevalence of surra in camels observed in District tank Khyber Pakhtunkhwa region is 5.67% and can be considered as low compared with other endemic regions (56% in Somalia, or 48% in Kenya) Further studies are needed in order to establish control measures in the affected herds, detect possible reservoirs and avoid dissemination of the disease controlling animal movements in the country.

Conclusions and Recommendations

It was concluded from the present study that 5.67% (17/300) samples were found positive for *Trypanosoma evansi*. Infection rate was higher in females (6.67%) as compared to males (4.67%). Highest (9.00%) infection was noted in camels above 4 years of age group followed by (5.00%) in camel below 2 years age group while lowest (3.00%) in 3-4 years age group camels.

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Novelty Statement

The study was performed to determine the Epidemiological Survey on Trypanosomiasis in Dromedary Camels. The explored information of this study will give an overall idea about the distribution of Blood parasitic infection among the study areas. It will also provide some epidemiological ideas in the occurrence of such disease. However, this study will make the way to take further extensive study related to these infections which will help to take necessary preventive and control measures against them.

Author's Contribution

IK and SA imagine idea of the manuscript. IK collected and processed blood samples. SA analyzed the data and drafts the manuscript. All authors reviewed the final version of the manuscript.

Conflict of interest

The authors have declared no conflict of interest.

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