



Field Investigation on the Prevalence of Trypanosomiasis in Camels in Relation to Sex, Age, Breed and Herd Size

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ABSTRACT

Blood samples were collected from 240 camels (183 male and 57 female) of four breeds from six districts of Sindh. An overall infection was determined as 11.25%. Species of *Trypanosoma* was identified as *Trypanosoma evansi*. District wise infection was found to be 2.5, 7.5, 12.5, 15.00, 22.5 and 7.5% in Hyderabad, Mirpur Khas, Umerkot, Badin, Thatta and Larkana, respectively. A higher infection was found in females (15.79%) as compared to males (9.84%). Highest (14.96%) infection was noted in age group >7 years, followed by 8.57 and 4.65% in 3 to 7 years and less than to 3 years old camels, respectively. Four breeds of camels were surveyed and the highest infection rate was found in Sakrai breed (21.82%), followed by 16.67, 6.15 and 5.95% in Kharai, Sindhi and Dhathi breeds respectively. When herd size was considered, infection rate was 1.67, 6.67, 15.00 and 21.67% in herds possessing 1 to 5, 6 to 10, 11 to 20 and more than 20 animals, respectively.

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INTRODUCTION

Camel is an important animal in the socio-economic system of Asia and Africa. There are approximately 1.2 million heads of dromedary camels in Pakistan, placing it at the third position in camel rearing countries (FAO, 2000). Out of this, majority of animals (41%) are found in Balochistan, which is the largest province followed by Sindh (30%), Punjab (22%) and North Western Frontier Province (7%; GOP, 2006). Primarily, camels are being raised for draught purposes, while in some cases, they are serving human beings by providing milk and meat (Ali *et al.*, 2009). They mainly exist in two types, namely riverine and mountainous. First type is well adapted to work in deserts and plains, while the latter is well adapted to work in mountain regions due to their strong and hard feet. Camels in the agrarian based country are contributing 2% towards the total milk production by supplying 798000 tonnes of milk/annum (Anonymous, 2008-2009). Their daily milk yield varies from 4 to 12 litres and under intensive management may produce as high as 40 litres of milk per day (Qureshi, 1986). Hence, Pakistani dromedary deserves to be the world's best milk type camel parallel to the Nili-Ravi buffaloes belonging to the same country. Draught attributes of mountainous camels are very admirable, as they can carry a load up to 600 Kg (Heston *et al.*, 1985), with pulling capacity up to 4600 Kg. Camel

calves possess a promising growth rate of 0.70 Kg/day under ordinary conditions of feeding and management (Iqbal, 1999).

Parasitism is one of the major problems that affect the productivity of camels. Parasitic diseases either lower the working efficiency or even may result in death of the animal. Camel trypanosomosis, also known as surra, is caused by *Trypanosoma evansi*. The disease is the most important single cause of economic losses in camel rearing areas, causing morbidity of up to 30.0% and mortality of around 3.0% (Njiru *et al.*, 2001).

In Pakistan, previous studies on the prevalence of sura have been carried out in North West Frontier Province (NWFP) and different area of Punjab (Bano and Jan, 1986; Khan *et al.*, 1987; Waheed *et al.*, 2003; Hassan *et al.*, 2006). The present study was planned to investigate the prevalence of *T. evansi* infection in camels in relation to age, sex, breed and herd size in different districts of Sindh province of Pakistan.

MATERIALS AND METHODS

Experimental animals

A total of 240 camels of different breeds and of both sexes (183 male and 57 female) were used to determine the prevalence of trypanosomiasis in 2008. The samples

were collected from the Hyderabad, Mirpur Khas, Umerkot, Badin, Thatta and Larkana districts of Sindh province of Pakistan (40 camels from each district). Furthermore, animals were divided into three age groups viz. less than 3 year (group A), 3 to 7 year (group B) and above 7 years (group C).

Collection of blood samples

From each animal, 5 ml blood was collected aseptically with the help of a disposable syringe from jugular vein and transferred into the screw capped tubes containing 0.5 ml of 1% ethylene diamine tetra acetate (EDTA) solution. Blood samples were transported to the Department of Veterinary Parasitology, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University, Tandojam to determine the prevalence of trypanosomiasis.

Examination of blood samples

A drop of blood was placed on a clean glass slide and a cover slip placed on it, allowing the blood to spread as a thin layer of cells. This was then examined under microscope to observe motile trypanosomes. For thin and thick smear staining techniques, a drop of blood was placed on the clean glass slide and another slide used to prepare the thin blood smear. Similarly, a large drop of blood was taken on the centre of another microscope slide for the thick smear and spread with a corner of another slide so that an area of approximately 1.0–1.25 cm in diameter was covered. The smears were allowed to air dry. The dried blood smears were fixed in absolute methyl alcohol for 5 minutes and allowed to dry (thick smear was dehaemoglobinized prior to fixing). The dry smears were stained with Giemsa's stain, washed with phosphate buffered saline to remove excess stain, allowed to dry and examined under microscope (1000 X).

Identification of *Trypanosoma evansi* was made on the basis of morphological characteristics (Chandler and Read, 1961). Prevalence of trypanosomiasis was calculated by using point prevalence formula (Thrusfield, 1995).

RESULTS AND DISCUSSION

The overall prevalence of trypanosomiasis in camels was recorded as 11.25%. Affected camels showed increased body temperature, anemia, emaciation, dullness, impaired appetite, edema, coughing and laboured breathing. Highest infection rate was recorded in Thatta district (22.5%), followed by 15.00, 12.5, 7.5, 7.5 and 2.5% in Badin, Umerkot, Mirpur Khas, Larkana and Hyderabad districts, respectively (Table 1). These results are parallel with the investigations made by Tekle and Abebe (2001), Hussain *et al.* (1991) and Shah *et al.* (2004), who reported 10.9, 13.2 and 13.72 % prevalence of *Trypanosoma evansi* in camels, respectively. Al-Rawashdeh *et al.* (2000) examined 140 blood samples of camels and overall infection rate of trypanosomiasis was recorded as 33%.

The results indicated that incidence of trypanosome was higher in females (15.79%) than males (9.84%). Higher infection recorded in females might be due to

stress during pregnancy and lactation, which could decrease resistance in female camels and render them more susceptible to *Trypanosoma evansi* infection. Shah *et al.* (2004) also reported higher infection rate of trypanosomiasis in female camels (15.68%) as compared to males (11.76%).

Our findings revealed highest prevalence of trypanosomiasis in above 7 year age group (14.96 %), followed by 8.57 and 4.65% in age groups 3 to 7 year and less than 3 years, respectively (Table 2). The higher prevalence in old camels might be due to heavy stress through their use for transportation of goods from one place to another and secondly due to poor management.

Infection rate according to herd size was recorded and the results highlighted highest prevalence in herds possessing more than 20 animals (21.67%), followed by 15.00, 6.67 and 1.67% in herds possessing 11 to 20, 6 to 10 and 1 to 5 animals, respectively (Table 3). Breed wise analysis revealed highest infection rate in Sakarai breed (21.82%), followed by 16.67, 6.15 and 5.95% in Kharai, Sindhi and Dhati breed, respectively (Table 4). However, Pathak and Khanna (1995) reported that all camels were equally susceptible to trypanosome infection regardless of breed and age.

Table 1: District-wise and sex-wise prevalence of trypanosome in animals (n = 40)

Districts	Male	Positive (%)	Female	Positive (%)	Overall (%)
Hyderabad	35	1(2.86)	5	0(0)	1 (2.5)
Mirpur Khas	30	2(6.67)	10	1(10)	3 (7.5)
Umerkot	27	3(11.11)	13	2(15.38)	5(12.5)
Badin	30	4(13.33)	10	2(20)	6(15)
Thatta	25	5(20.00)	15	4(26.66)	9(22.5)
Larkana	36	3(8.33)	4	0(0)	3 (7.5)
Total	183	18(9.84)	57	9(15.79)	27(11.25)

Table 2: Age-wise prevalence of trypanosomes in camels

Age (Years)	Total No.	Positive (%)
Less than 3	43	2 (4.65)
3 to 7	70	6 (8.57)
More than 7	127	19 (14.96)

Table 3: Herd-size wise prevalence of trypanosomes in camels

Herd Size	No. Herds	Total animals	Positive (%)
1 to 5	40	60	1 (1.67)
6 to 10	4	60	4 (6.67)
11 to 20	3	60	9 (15.00)
More than 20	5	60	13 (21.67)

Table 4: Breed-wise prevalence of trypanosomes in camels

Breed	Total No.	Positive (%)
Sindhi	65	4 (6.15)
Dhati	84	5 (5.95)
Kharai	36	6 (16.67)
Sakarai	55	12 (21.82)

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