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Trypanomosis in Camel (*Camelus dromedarius*) in Delo-Mena District, Bale Zone, Oromia Region, Southwest Ethiopia

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Abstract: Across sectional study was carried to determine the prevalence of camel trypanosomiasis (surra) in Delo-Mena district, Bale Zone, Oromia region, southwestern Ethiopia from September to December 2004. Blood samples were collected from randomly selected 395 camels. Wet film and Giemsa-stained blood smears were used for the detection of trypanosomes. Among these, 72 (18.22%) samples were positive for *Trypanosoma evansi* (*T. evansi*), the only *Trypanosoma* species identified. A higher infection was found in males (20.25%) as compared to females (17.72%). However, there was no statistically significant difference in prevalence between sex categories ($p > 0.05$). Highest 27.63% infection was noted in age group > 4 years, followed by 14.54 and 10.52% in 1 to 3 years and 3 to 4 years old camels, respectively. There was statistical significant difference ($p < 0.05$) in susceptibility among age groups. These results seem to indicate that *T. evansi* infection has a relatively low prevalence in the study area. There is a need of further study on the distribution and seasonality of the disease and its vectors in order to establish control measures in affected herds and avoid dissemination of the disease.

Key words: Blood % Camelus Dromedarius % Dalo-Mena % Ethiopia % Trypanosomosis

INTRODUCTION

Camels play a significant multi-purpose role in the dry lands of Ethiopia. The commonest uses of camels by the pastoralists are for transporting grain, water, salt and other goods as well as for milk and meat production. A study in Eastern Ethiopia indicated that camels work on average for 16 h per day, traveling 60 km [1]. They are very reliable milk producers even during the dry season and drought years when milk from cattle and goat is scarce [2].

Parasitism is one of the major problems that affect the productivity of camels. Of these parasitic diseases, camel trypanosomosis, also called surra, caused by *T. evansi*, is the main disease prevalent in most areas where camels are found [3]. Camel trypanosomosis causes anorexia, weakness and emaciation that lead to low milk and meat yield, poor traction power, increased abortion and death. 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% [4]. The disease is endemic in Africa, Asia and South America and in addition to camels it is reported in other species of domesticated livestock [5]. *Trypanosoma evansi* is mechanically transmitted by biting insects. Species of *Tabanus* and *Stomoxys* are vectors, although in America the vampire bat also acts as a vector as well as reservoir host [6].

In Ethiopia, the prevalence of camel trypanosomosis and its vectors have not yet been fully documented in most parts of the country. A study conducted in southern Ethiopia indicates that trypanosomosis is one of the leading health problems [1] and a prevalence of 21% has been reported in eastern Ethiopia [7]. However, there is no information in the literature on the prevalence of camel trypanosomosis and species of Trypanosomes species in the study area. The objectives of the present study were to determine the prevalence of camel trypanomiasis in the study area, identify the trypanosomes species prevalent and associated risk factors in camels in the study area and find the comparative infection rate in different age and sex groups of camels.

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MATERIALS AND METHODS

Study Area: A cross-sectional study was conducted between September and December 2011 in Dalo-Mena district, Bale Zone, Oromia region, south western Ethiopia. The district is located 555 km far from Addis Ababa, the capital city of the country. The average annual temperature ranges between 27-33°C. The area has two rainy seasons with the main rainy season from March to May and a small rainy season from September to November. The livestock population of the district comprises about 276,318 cattle,5246 sheep, 55,742 goat, 12, 582 donkey, 2, 452 horses, 9, 465 mule, 34, 957 camel and 36, 946 poultry [8].

Study Animals: A total of 395 indigenous breeds of camels (one hump camel) of different ages and of both sexes (79 male and 316 female), reared under extensive husbandry system were used to determine the prevalence of trypanosomiasis. The age of camels was determined by interviewing the owners and were grouped as young (<3 years old), middle (3-4years) and adult (> 4 years old).

Study Design and Sample Size Determination: A cross-sectional study design was used to determine the prevalence of camel trpanosomiasis in purposely selected sites of Dalo-Mena district. Simple random sampling was used to select each sampled camel. The desired sample size was determined based on the expected prevalence of 50% with 95% confidence level and 5% precision and calculated by the formula recommended by Thrusfield [9].

Sample Collection and Examination Procedures: Whole blood samples from 395 camels were collected by jugular vein puncture into 5 ml ethylene tetra-acetic acid (EDTA) coated vacutener tubes, kept in cooler box and transported immediately to the Goba Veterinary clinic laboratory for processing. For wet film technique, 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. Thin and thick blood smears were made, as per method described by Murray *et al*. [10]. Air dried smears were fixed in absolute methyl alcohol for 2-3 minutes. The slides were immersed in Giemsa's stain for 20-25 minutes and washed with tape water to remove excess stain. After air-drying, the slides were examined under oil immersion objective lens (100x) for detection and identification of *Trypanosoma* species based on their morphological characters [11].

Data Analysis: Data on individual animals and parasitological examination results was inserted into Ms-excel spread sheet program to create a database. The data were analyzed statistically using the Chi-square test (SPSS statistics 17.0). Differences between parameters were tested for significance at probability levels of 0.05 or less.

RESULTS

Of the total 395 blood samples collected and examined, 72 (18.22%) samples were positive for *T. evansi*. No other *Trypanosoma* species were detected. Highest trypanosome infection (27.63%) was recorded in age group of >4 years, followed by 14.54 and 10.52% in <3 years and 3 to 4 years old camels, respectively. There was statistical significant difference ($p>0.05$) between different age groups (Table 1). Out of the total examined camels, 16 (20.25%) positive cases were males and 56 (17.72%) cases females. Sex-wise analysis revealed that there was no statistical significant difference in prevalence ($P > 0.05$) (Table 2).

DISCUSSION

The overall prevalence of *T. evansi* infection in camels was found to be 18.22%. This might be associated with the season of the study period and sensitivity of the diagnostic techniques used. This result is higher compared with the investigations made by Hussain *et al.* [12], Takle and Abebe [13] and Shah *et al*. [14] who reported 13.2, 10.9, 10% prevalence of *T. evansi* in camels, in Saudi Arabia, Ethiopia and Pakistan, respectively.

The result of this study disagree with previous work of Pathak *et al*. [15], 7.5% and Tadesse *et al*. [16] 3.5%, in Jigijiga which reflects lower prevalence.

It is also disagree with the result of Zeleke and Bekele [7] (21%) in eastern Ethiopia selected semi-nomadic household, Mohamed [17] (20%) in Dire Dawa, southeastern Ethiopia with a slightly higher prevalence. In abroad countries various prevalence were reported by Pacholek *et al*. [18] (29%) in Niger, Enwsezor and Sackey [5] (28%) in Kenya, Al-rawshed *et al*. [19] (33%) in Jordan and Rami *et al.* [20] (35.4 and 43.3%) in morocco which indicates higher prevalence compared to the present study result. One possible explanation for the lower prevalence rate detected in this study could be or related to distribution, challenge and density of parasite vector as well as vector control management practices [21]. A more plausible explanation for the differences in prevalence rate could be the different sensitivity of different test methods,

Tabel 1: Age-wise prevalence of *T.evansi* infections in camels in the study area

Age	No. animals examined	No. positive	Prevalence (%)	Chi-Square (P^2)	P-value
<3years	110	16	14.54	15.311	0.000
3-4 years	133	14	10.52		
>4 years	152	42	27.63		
Total	395	72	18.22		

Tabel 2: Sex as a determinant and occurrence of *T. evansi* infection in camels

Sex	No. examined animals	No. positives	Prevalence (%)	Chi-Square (P^2)	P-value
Male	79	16	20.25	0.272	0.602
Female	316	56	17.72		
Total	395	72	18.22		

because different microscopic methods could result in small difference in positive rates in the survey of camel infection with *T. evansi* [22].

In this study, age-wise analysis revealed that there was significant difference in prevalence between age groups where a higher infection rate was recorded in older camels. 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 poor management. Atarhouch *et al*. [23] reported that the prevalence of *T.evansi* showed that a tendency for the infection rate to increase with age up to maximum in the 7-10 years old age. However, Pathak and Khanna [24] reported that all camels were equally susceptible to trypanosome infection regardless of breed and age.

In this study higher infection rate was recorded in males than females, this could be due to the fact that female camels were kept in house while males were used for work all the time and subject to graze out in the field. and However, other studies in Asia have reported sex related differences in prevalence in camels [14] where females (15.68%) were observed to be more susceptible to the disease than males (11.76%) counterparts. This record might be due to stress during pregnancy and lactation, which could decrease resistance in female camels and render them more susceptible to *T. evansi* infection.

CONCLUSION

The present study results seem to indicate that *T. evansi* infection has a relatively low prevalence in the study area. The disease causes a significant impact on the camel production and economic growth of the study area by affecting health and productivity of camels. There is a need of further study on the distribution and seasonality of the disease and its vectors in order to establish control measures in affected herds and avoid dissemination of the disease.

REFERENCES

1. Tefera, M. and F. Gebreab, 2004. A study on the productivity and diseases of camels in Eastern Ethiopia. Tropical Animal Health and Production, 33: 265-274.
2. Gebre, S. and G. Kaaya, 2008. Prevalence of camel ticks and haemoparasites in southern range lands of Ethiopia. Discovery Innovative, 20: 10-13.
3. Richard, D., 1976. The diseases of the dromedary (*Camelus dromedarius*) in Ethiopia. Ethiopian Veterinary Bulletin, 2: 46-67.
4. Njiru, Z.K., O. Bett, I.M. Ole-Mapeny, J. Githiori and J.M. Ndung'u, 2002. Trypanosomosis and helminthosis in camels: comparison of ranch and traditional camel management systems in Kenya. Journal of Camel Research and Practice, 55: 67-71.
5. Enwezor, F. and A. Sackey, 2005. Camel trypanosomosis A review. Veterinary. Archive, 75: 439-452.
6. Urquhart, G.M., J. Armour, J.L. Duncan, A.M. Dunn and F.W. Jennings, 1996. Veterinary Parasitology. 2nd ed. UK: Blackwell Science, pp: 103-113.
7. Zeleke, M. and T. Bekele, 2001. Camel herd health and Productivity in eastern Ethiopia selected semi-nomadic households. Revue D'elevage et De Medecine Veterinaire Des Pays Tropicaux, 55: 213-217.
8. Central Statistical Authority (CSA), 2008. Report on livestock and livestock characteristics; Volume II, Agriculture Sample Survey 2008/09.
9. Thrusfield, M., 2005. Veterinary epidemiology. 2nd ed. UK: Blackwell Science, pp: 228-247.
10. Murray, M.D., P.K. Murray and W.I.M. McIntyre, 1977. An improved technique for the diagnosis of African trypanosomes. Transactions of the Royal Society of Tropical Medicine and Hygiene, 71: 325-326.

11. Murray, M.D., J. Clifford and W.I.M. McIntyre, 1979. Diagnosis of African Trypanosomiasis in bovine. Trans. Transactions of the Royal Society of Tropical Medicine and Hygiene, 73: 120-121.
12. Hussain, H.S., N.A. Al-Asgah, M.S. AI-Khalifa and F.M. Diab, 1991. The blood parasites of indigenous livestock in Saudi Arabia. Arab-Gulf Journal of Scientific Research, 9: 143-160.
13. Takle, T. and G. Abebe, 2001. Trypanosomiasis and helminthoses: major health problems of camels (*Camelus dromedarius*) in the Southern rangelands of Borena, Ethiopia. Journal of Camel Practice Research, 8: 180-181.
14. Shah, S.R., M.S. Phulan, M.A. Memon, R. Rind and W.M. Bhatti, 2004. Trypanosomes infection in camels. Pakistan Veterinary Journal, 24: 209-210.
15. Pathak, K.M.L., J.K. Arora and M. Kapoor, 1993. Camel trypanosomosis in Rajasthan India. Veterinary Parasitology, 49: 319-323.
16. Tadesse, A., A. Omar, K. Aragaw, B. Mekbib and D.A. Sheferaw, 2012. Study on Camel Trypanosomosis in Jijiga Zone, Eastern Ethiopia. Journal of Veterinary Advances, 2: 216-219.
17. Mohammed, R., 1999. Camel trypanosomosis, prevalence and drug sensitivity test in Dire-Dawa administrative region, Southern Ethiopia. DVM thesis, Addis Ababa University Faculty of Veterinary Medicine, Debre-Zeit, Ethiopia.
18. Pacholek, X., D. Gamatic, S.G. Franek and R. Tibayrene, 2001. Prevalence of Trypanosoma evansi trypanosomosis in young camels in west Niger. Revue D'elevage et de Medecine Veterinaire desPays Tropicaux, 44: 177-182.
19. Al-Rawashdeh, O.F., L.A. Sharif, K.M. Al-Qudah and F.K. Al-Ani, 2003. Trypanosoma evansi infection in camels in Jordan. Revue D'elevage et de Medecine Veterinaire desPays Tropicaux, 20: 233-237.
20. Rami, M., T. Atarhouch, M.N. Bendahman, R. Azlaf, R. Kechna and A. Dakkak, 2003. Camels trypanosomosis in Morocco. A pilot disease control trial. Veterinary Parasitology, 115: 223-231.
21. Ford, J. and K.M. Katondo, 1977. Maps of tsetse fly (Glossina) distribution in Africa 1973, according to sub-generic groups on scale of 1:5,000,000. Bulletin of Animal Health and Production in Africa, 15: 188-194.
22. Delafosse, A. and A.A. Doutoum, 2004. Prevalence of Trypanosoma evansi infection and associated risk factors in camels in eastern Chad. Veterinary Parasitology, 119: 155-164.
23. Atarhouch, T., M. Rami, M.N. Bendahman and N.A. Dakkak, 2003. Camel Trypanosomosis in Morocco 1: results of a first epidemiological survey. Veterinary Parasitology, 111: 277-286.
24. Pathak, K.M.L. and N.D. Khanna, 1995. Trypanosomiasis in camel (*Camelus dromedarius*) with particular reference to Indian sub-continent: A Review. International Journal of Animal Science, 10: 157-162.