J. Protozool. Res., 7, 48-53 (1997)

Haemorrhagic *Trypanosoma vivax* Outbreak in Cattle in Mbale and Tororo Districts in Eastern Uganda

J. W. MAGONA, W. KATABAZI, W. OLAHO-MUKANI, J. S. P. MAYENDE AND J. WALUBENGO

Livestock Health Research Institute (LIRI), P. O. Box 96, Tororo, Uganda

Received 20 March 1998 / Accepted 26 April 1998

Key words : trypanosomosis; Buffy Coat Technique; packed cell volume.

ABSTRACT

Surveys were carried out between March and May, 1997 to rule out acute trypanosomosis, following reports from Farmers and field Veterinarians in Mbale and Tororo districts of an outbreak of strange disease causing considerable deaths of cattle, manifesting with anaemia, bleeding through the skin and ears, before death and, petechial haemorrhages on the tongue and enlarged spleen observed at postmortem. A total 808 cattle were examined by Buffy Coat Technique (BCT) for trypanosomosis and tsetse trapping was done in 5 subcounties in Mbale and Tororo districts. Bovine trypanosomosis was found to be prevalent in 8.7% to 26.5% of the cattle in Mbale district and in 27.8% to 34.8% of the cattle in Tororo district. Trypanosome infections found were largely due to *Trypanosoma vivax*. Cattle infected with trypanosomosis had a lower mean PCV (23.6±0.64) than those free (mean PCV of 26.9±0.25). Of the cattle examined, 43% had PCV (packed cell volume) below or equal to 24, hence manifested anaemia. According to the findings, clinical signs and high mortality, the outbreak was sue to haemorrhagic *T. vivax*. This is the first time an outbreak of haemorrhagic *T. vivax* is reported in Uganda. Tsetse flies caught were predominantly of the *Glossina fuscipes fuscipes* species (F/T/D/: 0.7-3.0) but few were of *G. pallidipes* (F/T/D/: 0.1). Immediate implementation of integrated control programme involving application of pour-on, chemotherapy and deployment of insecticide impregnated traps was recommended.

INTRODUCTION

Animal trypanosomosis endemic in Mbale and Tororo districts of Eastern Uganda. *Trypanosoma vivax, T. congolense* and *T. brucei* are the common *Trypanosoma* species found in cattle (Nyeko et al. 1989). Cases of bovine trypanosomosis have been previously observed to be chronic, mainly manifesting with anaemia and emaciation. Although the acute form of trypanosomosis due to haemorrhagic T. vivax had been reported elsewhere in East Africa (Mwongola et al. 1981; ILRAD 1984; Dirie et al. 1988; Stevenson and Okech 1997) none has been reported in Uganda. Despite the previous history of chronic form of trypanosomosis in cattle in the area, considerable cattle mortality was reported in February and April, 1997. Surveys were therefore carried out to establish the cause of death in the cattle and rule out acute trypanosomosis.

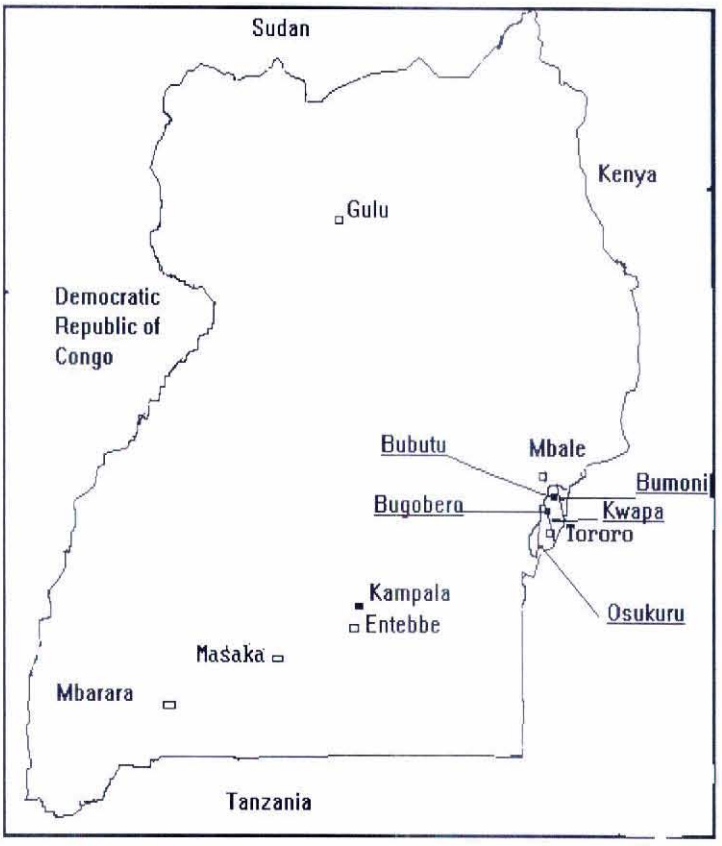

Fig. 1 Map of Uganda showing locations (underlined) where outbreaks of Haemorrhagic *Trypanosoma vivax* occurred in cattle between March and May, 1997.

MATERIALS AND METHODS

Survey area

Surveys were carried in areas where disease outbreaks had been reported. The areas included Bumoni, Bubutu and Bugobero subcounties in Mbale district and Osukuru and Kwapa subcounties in Tororo district (Fig. 1).

Selection of survey sites

One village was selected from each subcounty. Selection of villages was based on reports of the disease outbreak. Farmers in selected villages were informed through local Chiefs and Veterinary staff to bring all their cattle to selected centres. Examination of cattle took place at one centre per day.

Cattle

Eight hundreds and eight (808) cattle examined were of the Nkedi Zebu breed. Records revealed that 80% of the herds examined had 1 to 10 cattle and 20% had over 10 cattle. Cattle of all ages were presented by the farmers.

Examination for trypanosomosis

Cattle were bled from the jugular vein using non-heparinized vacutainers. About 5 ml of blood was taken from each animal. One ml of blood was immediately taken from each vacutainer into Bijou bottle with EDTA. Non-heparinized micro-haematocrit capillary tubes were filled with blood (70μl) in the Bijou bottles and sealed with Plasticine at one end. The filled capillary tubes were then centrifuged for 5 min. The Packed Cell Volume (PCV) was read using the Mocro-haematocrit Reader (Hawkley, England) followed by examination for trypanosome under microscopy by Buffy Coat Technique (BCT) according to Murray et al. (1977). Confirmation of trypanosome species identification was done based on the parasite morphology on Thin and Thick blood smears stained with Giemsa.

Tsetse trapping

During tsetse trapping, 9 biconical traps baited with acetone were left in the field for 48 hrs and were checked every day until removed. Flies caught were sexed, aged and counted then the apparent tsetse density was expressed as the flies per day per trap (F/T/D).

RESULTS AND DISCUSSION

Table 1 shows the prevalence of trypanosomosis in cattle in areas affected

with haemorrhagic *T. vivax*. The highest mortality rate of cattle almost 100% for small herds, was reported in Maresi, Mella and Angorum villages. Correspondingly, these were villages with a high prevalence of *T. vivax* infection (26.5-34.8%).

Previous surveys found only *Glossina fuscipes fuscipes* in Tororo and Mbale districts in Eastern Uganda (Okoth et al. 1991). However, tsetse surveys done during the outbreak found *Glossina pallidipes* (Table 2) in the areas during the outbreak. *Glossina pallidipes* seems to be quite important in the transmission of haemorrhagic *T. vivax* as similarly reported in Kenya on Galana ranch by Stevenson and Okech (1997).

Table 1 Prevalence of trypanosomosis in cattle in areas with the outbreak in Mbale and Tororo districts, Eastern Uganda, 1997.

Month	District	Subcounty	Village	Cattle examined	Prevalence of trypanosomosis (%)			
					T.b.	T.c.	T.v.	overall
March	Mbale	Bumoni	Bukoma	173	0.0	0.0	8.7	8.7
March	Mbale	Bubutu	Maresi	68	0.0	0.0	26.5	26.5
March	Mbale	Bugobero	Bunefule	97	0.0	0.0	15.5	15.5
May	Tororo	Kwapa	Mella	276	0.0	0.0	34.8	34.8
May	Tororo	Osukuru	Angorom	194	0.5	0.0	27.8	28.3

T.b.: *Trypanosoma brucei*, T.c.: *T. congolense*, T.v.: *T. vivax*.

Table 2 Tsetse species caught areas with haemorrhagic *Trypanosoma vivax* outbreak in cattle in Mbale and Tororo districts, Eastern Uganda, 1997.

Month	District	Subcounty	Village	Tsetse species	F/T/D
March	Mbale	Bumoni	Bukoma	nil	0.0
March	Mbale	Bubutu	Maresi	nil	0.0
March	Mbale	Bugobero	Bunefule	*G. f. fuscipes*	1.0
April	Tororo	Osukuru	Nyalakot	*G. f. fuscipes*	0.7
April	Tororo	Osukuru	Nyalakot	*G. pallidipes*	0.1
May	Tororo	Kwapa	Mella	nil	0.0
May	Tororo	Osukuru	Angorom	*G. f. fuscipes*	3.0

According to Fig. 2, cattle with *T. vivax* infection expressed signs of anaemia and had a lower mean PCV (24%) compared to those which were free of the infection (27%). The presence of *T. vivax* in the blood of cattle with the haemorrhagic syndrome and such a high prevalence of *T. vivax* infections in herds most affected with the outbreak, helped to confirm the presence of haemorrhagic *T. vivax*. Other haemorrhagic syndromes were ruled out based on clinical signs, history of recent vaccinations against epidemic diseases like Rinderpest and by detection of trypanosomes in blood of cattle in affected herds and areas.

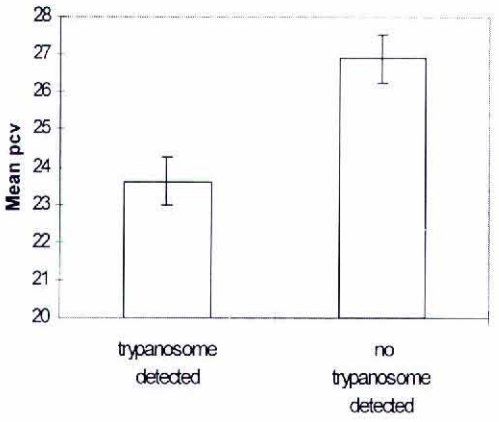

Fig. 2 Comparison of mean PCV of cattle detected infected (n=78) to cattle detected free of trypanosomosis (n=187) in Tororo district, Eastern Uganda, 1997.

The fact that the outbreak occurred in areas previously with tsetse and trypanosomosis control and also in areas originally thought free of tsetse and trypanosomosis, it implies that cattle in the area were quite susceptible due to none or little exposure to trypanosomosis to the extent that mild strains of *T. vivax* could have become virulent and hence led to the outbreak. Stabilates were made for further experimental investigation and sera were collected for further serological studies. It is now clear that haemorrhagic *T. vivax* is more widespread in East Africa beyond the Coast of Kenya where it was thought to be confined. The epidemic was later controlled after by chemotherapy using isometamidium chloride and deployment of tsetse traps.

ACKNOWLEDGEMENTS

I appreciate the assistance accorded to the survey team by Drs. Musunga, Okello and Were of Mbale District Veterinary Office during the disease investigation. I am grateful to Michael Oretum and Godfrey Odyek for technical assistance. This paper is published with the permission from Director of LIRI.

REFERENCES

Dirie, M. F., Wallbank, K. R., Molynuexx, D. H., Bornstein, S. & Omer, H. A. 1988. Haemorrhagic syndrome associated with *T. vivax* infections of cattle in Somalia. *Acta Tropica 45:* 290-292.

ILRAD Report 1984. Anaemia in trypanosomosis due to haemorrhagic *T. vivax* may provide a clue. *ILRAD Report 2:* 4.

Murray, M., Murray, P. K. & McIntyre, W. I. M. 1977. An improved parasitological technique for the diagnosis of African trypanosomosis. *Trans. Royal Soc. Trop. Med. Hyg. 71:* 325-326.

Mwongela, G. N., Kovatch, R. M. & Fazil, M. A. 1981. Acute *Trypanosoma vivax* infection in dairy cattle in Coast province of Kenya. *Trop. Animal Health Prod. 13:* 63-69.

Nyeko, J. H. P., Ociba, P. M., Saimo, M. M., Buga, R., Okuna, N. M. & Mayende, J. S. P. 1989. Bovine trypanosomosis survey in the human sleeping sickness districts of Uganda. *In:* Proceedings of the 20th meeting of the Int. Scient. Council for Tryps. Research and Control (I. S. C. T. R. C.), Mombasa-Kenya. 1989. *115:* 295.

Okoth, J. O., Okeith, V. & Ogola, A. 1991. Control of tsetse and trypanosomosis transmission in Uganda by application of Lambachhalothrin. *Med. Vet. Entomol. 5:* 121-128.

Stevenson, P. & Okech, G. 1997. Haemorrhagic *Trypanosoma vivax* on Galana Ranch in Kenya. *In:* Proceedings of the 24th meeting of the Int. Scient. Council for Tryps. Research and Control (I. S. C. T. R. C.), Maputo-Mozambique. October, 1997.