

Epidemiology of small ruminant trypanosomosis in some communities Jos East, Plateau State: A Guinea Savana Zone, North-Central Nigeria

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ABSTRACT

An epidemiological survey of animal trypanosomosis was conducted in some communities of Jos East LGA, Plateau State, Nigeria where 558 peridomestic animals (sheep and goats) were bled for both parasitological and haematological analysis. The screening for the presence of trypanosomes using haematocrit centrifugation technique (HCT), thin and thick films revealed 51 (9.13978%) were found positive for trypanosomes. Out of this 36 (6.452%) infected with *T. vivax* while 15 (2.688%) were found to be infected with *T. brucei*. The PCV values were significantly higher in non-infected small ruminants.

Key words: epidemiology; peridomestic (small ruminants); trypanosomosis

INTRODUCTION

Small ruminants form an important part of the livestock industry in the sub-saharan Africa. They serve as valuable supplement to cattle in term of animal protein supply for the teaming population including the provision of manure for field crops. It has also been estimated that over 90% of sheep and goats in the sub-saharan Africa are found in East and West Africa (ILCA, 1989; ILCA, 1990). In spite the importance of these animals to the rural poor farming communities (dwellers), research into the incidence trypanosome infection in sheep and goats is limited.

In the reports of Krammer (1966) showed that trypanosomosis was of little importance in goats reared in the Eastern part of Nigeria. Also that goats are seldom infected with salivarian trypanosomes (Stephen, 1970). However, experimental studies have shown that small ruminants are fully susceptible to infection with pathogenic trypanosomes (Anosa, 1974; Whitelaw *et al.*, 1985; Shamaki *et al.*, 2006) The roles of small ruminants in the epidemiology of the disease in nature is still not known, but its been shown that goats and sheep could act as reservoir for the spread of animal and human trypanosomosis (Kalejaiye *et al.*, 1995; Yanan *et al.*, 2005; Dede *et al.*, 2005). On the Jos Plateau area in the recent past sheep and goats were screened from the abattoir for trypanosomosis, this revealed prevalent rate of 5.4% in sheep and 2.9% in goats respectively (Eche, 1995). Field surveys of the disease in sheep, goats and in cattle have been reported (Kanyari *et al.*, 1986; Yanan *et al.*, 2005). The results of this investigation presence natural occurrence of trypanosomes infections in small ruminants in these communities, the effect of the disease was discussed.

MATERIAL AND METHODS

Study areas: 4 communities (Angware, Durbi, Fobur and Federe) were the areas surveyed in Jos East LGA, Plateau state, North-Central Nigeria.

Animals: The small ruminants bled comprise mostly of the African dwarf breeds and few Yankasa breed of sheep. 3-5ml was collected from the jugular veins of each sheep and goats following proper

restrained into an ethylene diamine tetracetic acid (EDTA) bottles. Each sample was kept cool under ice pack in a flask after collection and transporting to the laboratory.

Screening of the blood for trypanosomes were carried out using the standard trypanosome techniques, haematocrit centrifugation technique (HCT), buffy coat method (BCM), thick and thin giemsa smear stained films. Also the pack cell volumes (PCV) of all the animals were recorded using micro-heamatocrit reader. Statistical analysis involving the means and standard deviations of infected and non infected PCV values of these animals to determine whether there is significant different between them. The data were subjected to the student's t-test where P greater than ($P > 0.05$) considered not significant. All positive dogs were treated with diminazene aceturate at the dose the dose rate of 3.5 mg/body weight.

Rat inoculation: 5 ml of the positive samples from sheep or goats were inoculated into laboratory rats and monitored for possible re-infection 40 days post infection in the laboratory rats for further investigation.

RESULTS

Table I, Showing the number of animals in each communities, the distribution of trypanosomes encountered.

	No of animals	No of +ve animals	<i>T. vivax</i>	<i>T. brucei</i>	<i>T. congolense</i>
Angware	188	24	9	15	-
Durbi	260	12	12	-	-
Federe	48	8	8	-	-
Fubur	62	7	7	-	-

Table II, Trypanosomes infection rates in different breeds of sheep and goats screened in these communities.

Breed	No Animals	No of +ve Animals	<i>T. vivax</i>	<i>T. brucei</i>	<i>T. congolense</i>
West African Dwaft	510	28	36(6.45%)	15(2.688%)	-
Yankasa	48	8	-	-	-

DISCUSSION

The small ruminants screened in this survey were predominantly peridomestic animals in these communities belonging to the rural poor farmers, these categories of animals are particularly suited to the traditional systems due to their small size with low feed requirement. Most of these animals were the West African Dwaft (WAD) breed, except for a few Yankasa breed of sheep that were sampled among them. This investigation confirms other reports earlier documented that *T. vivax*, *T. brucei* and *T. congolense* occurs naturally in domestic sheep and goats (Joshua and Ige, 1982; Kalejaiye *et al.*, 1995; Eche, 1995; Yanan *et al.*, 2005; Dede *et al.*, 2005). The dominance of *T. vivax* infection encountered in this study is a further confirmation ealier findings documentd (Joshua and Shantikmar, 1989; Daniel *et al.*, 1994; Kalu and Uzoigwe, 1996; Kalejaiye *et al.*, 2005).

The prevalence rate of trypanosomes recorded in this survey is 9.14% which is in confirmation with other surveys carried out in the recent past in ruminants where 8.4%, 8.3%, 7.5%, 8.85% and 7.5% respectively (Joshua and Ige, 1982; Eche, 1995; Omotainse *et al.*, 2001; Shamaki *et al.*, 2006; Yanan *et al.*, 2003).

The prevalence in sheep and goats ranges almost same with other large ruminants suggestive of the fact that small ruminants are not normally priotised subjects for veterinary supervision or included in

chemotherapeutic and chemoprophylactic campaigns of government or herdowners for diseases control programmes. The importance of livestock cannot be overemphasized; with the presence infection rate encountered in these small ruminants it is therefore evidently clear that Jos East LGA of Plateau State, Nigeria is enzootic for animal trypanosomosis. If the situation is left unattended to, which is already bad could still go up to an alarming proportion and will have deleterious effect on livestock production in the area. There is the need to embark on a comprehensive survey both wet and dry seasons for trypanosomosis control programme in this area and using modern diagnostic technologies for the identification of different species which these animals maybe serving as reservoir hosts for both animals/humans.

In conclusion, for a sustainable control measures to be put effectively in place, there should also be further investigation on the socioeconomic effect of animal trypanosomosis and the menace fly bites complained by the hunters, herdowners and crop farmers in the area.

REFERENCES

- Anosa, V.O. 1974. Experimental *T. vivax* infection of sheep and goats: The relationship between the parasitemia, growth rate and the anaemia. J. Nig. Med. Assoc. 3: 101-108.
- Daniel, A.D., Joshua, R.A., Kalejaiye, J.O. and Dada, A.J. 1994. Prevalence of trypanosomiasis in sheep and goats in a region of northern Nigeria. Rev. Elev. Med. Vet. Pays Trop. 47(3): 295-297.
- Dede, P.M., Hallid, I., Omoogun, G.A., Uzoigwe, N.R., Njoku, C.I., Daniel, A.D. and Dadah, A.J. 2005. Current tsetse and trypanosomosis situation on Jos Plateau, Nigeria: Epizootiological factors that may enhance disease transmission and spread. Rev. Elev. Med. Vet. Pays Trop. 58(1): 31-55.
- Eche, T.A. 1995. The Incidence of trypanosomiasis and other haemoparasites in sheep and goats of Southern Jos, Plateau State, Nigeria. Project Submitted to the Fed. College of Anim. Hlth. And Prod. Tech., Vom, In Fulfilment of the requirement for the award of a higher National Diploma in animal Hlth. And Prod. Tech.
- ILCA, 1989. International Livestock Centre for Africa. Annual Report. Addis Ababa. 1990.
- ILCA, 1990. International Livestock Centre for Africa. Annual Report . Addis Ababa. 1991.
- Joshua, R.A. and Shamtikutmar, S. 1989. Naturally occurring trypanosomiasis in some cattle herds around the Jos Plateau of Nig. Bull Anim. Prod. Africa 37: 95-96.
- Joshua, R.A. and Ige, M. 1982. The incidence of trypanosome infection in Sokoto red goats at slaughter. Bull. Anim. Prod. Afr. 30: 35-39.
- Kalejaiye, J.O., Yanan, E.G., Shamaki, B.U., Odoya, E.M., Evuti, A.M., Obaloto, O.B. and Ajagbona, V.N. 2005. Occurrence of ruminant trypanosomiasis in Toro L.G.A of Bauchi State. The Proceeding of the 42nd Congress of Nig. Vet. Med. Assoc. 197-198.
- Kalejaiye, J.O., Ayanwale, F.O., Oholi, R.A. and Daniel, A.D. 1995. The prevalence of trypanosome in sheep and goats at slaughter. Israel Journal of Veterinary Medicine 50(2): 57-59.
- Kalu, A.U. and Uzoigwe, N.R. 1996. Tsetse fly and trap on the Jos Plateau: Observation on outbreaks in B/Ladi L.G.A. Trop. Vet. 14:114-126.
- Kanyari, P.W.N., Munyua, W.K. and Wilson, A.J. 1986. Goats trypanosomiasis, trypanotolerance and epidemiology among goat breed in Kenya. Bull. Anim. Hlth. Prod. Africa. 34:93-97.
- Krammer, J.W. 1986. Incidence of trypanosomiasis in the West African dwarf sheep and goat in Nsukka, Eastern Nigeria. Bull. Epizoot. Dis. Afr. 14: 423-428.
- Omotainse, S.O., Kalejaiye, J.O., Eche, T. and Halid, I. 2001. The Prevalence of Animal Trypanosomiasis in Yamaltu Deba LGA of Gombe State, Nigeria. African J. of clin. Exp. microbiol. 2(2):10-12.

- Shamaki, B.U., Obaloto, O.B., Yusuf, A.B., Abubakar, A., Iliyasu, B., Omotainse, S.O., Yanan, E.G., Kalejaiye, J.O., Odoya, M.E. and Evuti, M.A. 2006. Comparative efficacy of Berenil (farvet) and Trypadim (merial) in the treatment *Trypanosoma congolense* in West African Dwarf (WAD) Goats. Journal of Research in Agriculture JRA, Vol., No.4.
- Stephen, L.E. 1970. Clinical manifestation of the trypanosomiasis in livestock and other domestic animals. pp. 774-794. In: The African Trypanosomiasis. Mulligan, H.W. (Eds), Allen and Unwin/ODA, London.
- Whitelaw, D.D., Kaaya, G.P., Moulton, J.E., Moloo, S.K. and Murray, M. 1985. Susceptibility of different breeds of goats in Kenya to experimental infections with *Trypanosoma congolense*. Trop. Anim. Hlth. Prod. 17:155-165.
- Yanan, E.G., Dede, P.M., Kalejaiye, J.O., Balak, G.G., Omotainse, S.O. and Uzoigwe, N.R. 2005. Prevalence of animal trypanosomiasis in large and small ruminants in Kadunu District, Mangu L.G.A, Plateau state Nig. The proceedings of the 42nd congress on Nig. Vet. Med. Assoc. 24-27.
- Yanan, E.G., Dede, P.M. and Uzoigwe, N.R. 2003. A survey of animal trypanosomiasis in selected Muturu herds from different locations on the Jos, Plateau State, Nigeria. Nigeria Veterinary Journal 24(3): 39-41.