



Small Ruminant Trypanosomiasis in Rigasa, Suburban Kaduna, Northwest, Nigeria

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Received: December 2015

Revised and Accepted: January 2016

Abstract

Tsetse-transmitted Trypanosomiasis is still regarded as one of the most severe medical and veterinary problems in Africa. The potential of domestic animals serving as reservoirs for Trypanosomiasis infections in humans and animals (in South, East and West Africa) has been widely discussed. Small ruminant production is a very important aspect of livestock production in sub Saharan Africa. Small ruminants are estimated to provide up to 30% of meat and 15% of milk production in sub Saharan Africa. Prevalence rates in Northern Nigeria are varied from 1.0% to 35.20%. Small ruminants may also serve as reservoirs of infection to cattle. This is very significant as small ruminants have been shown to be relatively trypanotolerant and most owners do not routinely treat them for Trypanosomiasis; thereby further enhancing their capacity as carriers. This study was carried out to investigate the prevalence of Trypanosomiasis in herds of goats reared alongside cattle that were kept by extensive management within Kaduna metropolis. Trypanosomiasis was found to be prevalent in the area. The role of small ruminants as carriers and possible reservoir hosts for Trypanosomiasis in cattle is also discussed.

Keywords: *Trypanosomiasis, small ruminants, reservoir, point prevalence, Kaduna.*

1.0 INTRODUCTION

Tsetse-transmitted Trypanosomiasis is still regarded as one of the most severe medical and veterinary problems in Africa (Masiga *et al.*, 2002). The disease has been described as a very important constraint to increasing the livestock production potential of Africa and Nigeria (Hursey, 2000). It has been estimated that if Tsetse and Trypanosomiasis can be controlled,

over 90 million extra cattle can be produced in Africa with Nigeria able to multiply up to three fold its current population (Onyiah, 1997). The potential of animals serving as reservoirs for Trypanosomiasis infections in humans and animals (in South, East and West Africa) has been explored (Welburn *et al.*, 2001; Njiokou *et al.*, 2010; Hamil *et al.*, 2013). Small ruminant

production is a very important aspect of livestock production in sub Saharan Africa. They are estimated to provide up to 30% of meat and 15% of milk production in sub Saharan Africa (Luckins, 1992). The importance of Trypanosomiasis in small ruminants was previously downplayed, but a steady flow of research in the area is currently changing that perception (Kalu *et al.*, 1991; Osho *et al.*, 2002; Okoli, 2003; Gutierrez *et al.*, 2006; Yanan *et al.*, 2007;). Prevalence rates in Northern Nigeria are varied; from 1.6% in sheep and 1.0% in goats (EEC Mid-Term Report, 1992) to 35.2%, 7.5%, 9.14%, 9.49%/5.08% (sheep/goats) in small ruminants found in Benue, Gombe, Plateau and Kaduna States respectively (Omotainse *et al.*, 1994; Omotainse *et al.*, 2001; Lawani *et al.*, 2004; Yanan *et al.*, 2007). Small ruminants may also serve as reservoirs of infection to cattle

(Gutierrez *et al.* 2006; Yanan *et al.*, 2007; Samdi *et al.*, 2010). This is very significant; as small ruminants have been shown to be relatively trypanotolerant and most owners do not routinely treat them for trypanosomiasis. This further enhances their carrier status. Trypanosomiasis has been shown to produce acute, subacute, chronic or subclinical forms of infections in goats with *Trypanosoma vivax*, *T. congolense* and *T. evansi* being the most invasive in the species (Gutierrez *et al.*, 2006).

This study was carried out to investigate the prevalence of trypanosomiasis in a herd of goats found among a herd of cattle that are kept by extensive management within Kaduna metropolis. The role of small ruminants as carriers and possible reservoir hosts for trypanosomiasis in cattle is also discussed.

2.0 MATERIALS AND METHODS

1.1. Study area:

The study was conducted in Guguwa, Rigasa, Igabi local government area, Kaduna State, North West Nigeria. Rigasa is part of Kaduna metropolis. Kaduna State is located on latitude 10°N, longitude 10°E and altitude 616 m above sea level. Mean annual rainfall is between 880-1380mm. The area lies within the sub humid zone, which is characterized by a dry season period from November to April, and a rainy season from May to October. The vegetation consists of the typical Northern Guinea savannah woodland. Sampling was carried out at two points in Guguwa. They are N10°32'53.5" E 7°19'21.3" and N10°33'10.7" E 7°19'17.6" and elevation of 641m.

1.2. Sampling and Diagnosis:

A total of 51 goats were sampled from three herds. These goats are housed and sometimes herded

along with cattle belonging to Fulani herdsmen. About 3mls of blood was drawn from the jugular vein using a hypodermic needle and transferred into an Ethylene Diamine Tetra-acetic Acid (EDTA) sample bottle. Parasitological examination was carried out using the Standard Trypanosome Detection Method i.e Haematocrit centrifugation technique HCT (Woo, 1971), Buffy coat method BCM (Murray *et al.*, 1977), and Giemsa stained thick & thin films. The packed cell volume (PCV) of each animal was also determined while trypanosome species were identified based on their motility using the BCM and morphological features from Giemsa stained films.

1.3. Statistical analysis:

The data obtained from this study was analyzed using the student's t-test. A p-value of <0.05 or less was considered significant.

3.0 RESULTS

A summary of the results can be seen in the table below (Table 1). A total of 12 (23.53%) animals were found to be positive with *Trypanosoma*

congolense and *T. brucei*. The average PCV observed was 24.34%. The average PCV of infected animals (21.75) appeared lower than that

of uninfected (25.00). The values were statistically insignificant ($p>0.05$). No clinical

signs attributable to Trypanosomiasis were observed in the herds sampled.

Table 1: Summary of Results.

Index	Value	%
Total Number Sampled	51	
Number of positive Samples	12	23.53
Number of Negative Samples	39	
Trypanosome species	<i>T. congolense</i>	83.3
	<i>T. brucei</i>	16.7

4.0 DISCUSSION

A point prevalence of 23.53% is quite significant when compared to recent prevalences of 1.2% in Abia, south east Nigeria (Ohaeri, 2010) or previous reports of 5.0% (Daniel *et al.*, 1994) or 9.14% (Yanan *et al.*, 2007) in northern Nigeria. It is also important to note that the study was carried out in a suburban area, on the fringes of a highly populated urban settlement. An area where farming and human settlements are present greatly reduces vector (tsetse fly) population (thereby the possibility of infection) due to the fragmentation of their habitat (Ducheyne *et al.*, 2009). Another important point is the possibility of these small ruminants serving as reservoir hosts for cattle trypanosomiasis while showing no obvious clinical signs of disease (Ng'ayo *et al.*, 2005; Yanan *et al.*, 2007). The proximity of these animals to cattle combined with the habit of

farmers not treating them (small ruminants) for trypanosomiasis (Wayo, personal communication, 2010), makes them ideal as reservoirs for infection in cattle.

Of concern is also the proximity of these animals to an urban settlement and the possibility of their harboring human trypanosomes. *T. brucei* accounts for only 16.7% of the infection rate. However, it is possible that these could be human infective trypanosomes (Katunguka-Rwakishaya, 1996). Although it has not been proven to occur in this region, there is a need to carry out more expansive studies in the area in order to have a clearer picture of trypanosome species/strains and prevalence in the area. However, human serum-resistant *T. congolense* has been previously reported in the region (Joshua, 1989).

5.0 CONCLUSION

We can conclude that trypanosomiasis prevalent in the area. Further studies need to be conducted in order to ascertain the extent of its occurrence as well as its impact on the health and wellbeing of animals and man in the area.

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