

The Prevalence of Trypanosomosis in Female Wad Goats in Three Local Government Areas of Ibadan, Nigeria

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Abstract: Trypanosomosis is one of the major challenges to the utilization of the vast agricultural endowment of tropical Africa. The West African dwarf (WAD) goat is perhaps the most adapted goat to the climate in tropical Africa. This study investigated the prevalence of trypanosome infection in the WAD goat from three local government areas in Ibadan, the biggest city in West Africa between March-December, 2008. Wet, thin, thick films, Haematocrit Centrifugation Technique and Buffy Coat methods were used to detect trypanosomes in the blood samples collected through the jugular vein from One thousand, four hundred and fourteen goats. *T. congolense* alone accounted for the highest infection (i.e. 58.33%) while mixed infection involving *T. congolense* and *T. vivax* accounted for the least (i.e. 4.17%) infection. The percentages of infection caused by *T. vivax*, *T. brucei* and mixed infection with *T. vivax* and *T. brucei* were 16.67, 8.33 and 12.5%, respectively. No single blood sample was positive for mixed infection between *T. congolense* and *T. brucei*. The study showed that the total prevalence of trypanosomosis in WAD goat from the 3 local government areas in Ibadan was 1.70%. These results confirmed the prevalence of trypanosome infection in female WAD goats in Ibadan and could serve as a basis for future research efforts on trypanosome infection in the WAD goat in the locality.

Key words: Trypanosomosis • Prevalence • Female WAD goats • Ibadan

INTRODUCTION

Development in the livestock sector of the agricultural industry in sub-Saharan Africa has been hindered by many factors. Apart from the low reproductive potential of our indigenous breeds, management factors such as nutrition and infectious diseases are major factors that have limited the growth of the industry. Trypanosomosis caused by Trypanosomes (transmitted by tsetse flies) is one of the most important diseases of livestock in tropical Africa. Some reports have it that the disease (i.e. trypanosomosis) presents a major constraint in the development of the vast resources in terms of animal production available in the African content [1, 2]. About 10 million square kilometers in over 40 countries of Africa are occupied by tsetse fly transmitting trypanosomosis and placing about 48 million cattle at the risk of contracting the disease which has caused losses of animals in term of milk and meat [3]. The loss per year in livestock production in tsetse

infested countries of Africa has been valued at about 5 billion US dollars [4]. Most of the studies in trypanosomosis have been focussed on the cattle, while almost neglecting the small ruminant species e.g. the goat. This might probably be due to the observation that the West African dwarf goats are trypanotolerant [5, 6]. Studies conducted in East African countries reported that goats often times acquire natural infection associated with economic losses while survivors become reservoirs of the parasite [7]. The reduction in funding for research on trypanosomosis may have accounted for the paucity of information on the current status of the disease in many parts of the countries endemic for the disease. In Nigeria, some studies have described the prevalence of trypanosomosis in various species of livestock including ruminants and swine, [8-13]. In the goat, prevalence rate of trypanosomosis have been reported as 3.5% [11], 1.2% [12], 0.7% [14], 5.0% [15] and 8.1% [16] from different studies. None of these studies however investigated the prevalence of trypanosomosis in Ibadan where the

present work was carried out. Hence this study aimed at determining the prevalence of trypanosomosis in the West African dwarf goats in three local government areas (i.e. Akinyele, Ibadan North and Ibadan South) located within Ibadan, Oyo State, Nigeria.

MATERIALS AND METHODS

Location of Study: The study was conducted in three Local government areas i.e. Akinyele, Ibadan North and Ibadan South (LGAs) within the city of Ibadan, Oyo State, Nigeria between March and December, 2008.

Ruminant Animals: In each of the local government areas, between 438 and 500 female West African dwarf goats with age range 1-3 years from randomly selected markets and households were sampled. Age was assessed through dentition.

Method of Sampling: About 3-5 ml of blood was collected from the jugular vein in bijoux bottle containing 1 milligram powder of Ethylene Diamine Tetra Acetate (EDTA) per ml of blood for parasitology and haematology. Parasitological examination was carried out using the standard detection techniques (wet, thin and thick films) for quick assessment and by the Haematocrit Centrifugation Technique (HCT) for accurate diagnosis [17]. The Packed cell volume (PCV) of each animal was also read with the aid of the microhaematocrit method [18]. Trypanosome species were identified based on their morphological structures from Giemsa stained films.

Statistical Analysis: The data obtained from the study was analysed using the student’s t-test [19]. Analysis was done at 5% level of significance.

RESULTS

The result of the study on prevalence of trypanosomosis in the three local government areas selected within Ibadan is as shown in Table 1 below. A total of 1414 female goats were examined in the study as follows: 500 from Akinyele, 438 from Ibadan North and 476 from Ibadan South local government areas. In all, only 24 of the animals examined i.e. 1.70% were positive for trypanosomes. The species of trypanosomes found in this study were *Trypanosoma congolense*, *Trypanosoma vivax* and *Trypanosoma brucei*. *T. congolense* accounted for (41.67%), *T. vivax* (29.17%) and *T. brucei* (29.17%) of the total infection. Four (4) mixed infections were also encountered representing 20% of the total infection observed. Mixed infection involving *T. congolense* and *T. vivax* accounted for 25% while that involving *T. vivax* and *brucei* accounted for 75%. No single simultaneous infection between *T. congolense* and *T. brucei* was found.

DISCUSSION

The result of this study showed that the infection rate in Akinyele Local government (i.e. 2.00%) was higher than at Ibadan north (i.e. 1.60%) and Ibadan south (1.47%) local government areas. The result of this study also showed that the prevalence of natural infection of trypanosomosis in sampled goats from the three selected Local government areas within Ibadan, Nigeria was about 1.70%. This figure is slightly higher than 1.2% prevalence in goats in part of Abia State, Nigeria [12] but appreciably lower than 4.67% observed in Kaduna State [13] and 33.9% reported in goats from Benue State, Nigeria [8]. A prevalence of 3.5% in goats has also been reported in a study carried out at Ogbomoso, Oyo State Nigeria [11].

Table 1: Prevalence of Trypanosomosis in Female WAD goats in three local government areas in Ibadan, Oyo State, Nigeria

Local Government Area.	No of animals examined	No of samples positive for trypanosomes	No positive for <i>T. congolense</i>	No positive for <i>T. vivax</i>	No positive for <i>T. brucei</i>	Mixed infection			Overall infection (%)
						<i>T. congolense</i> and <i>T. vivax</i>	<i>T. congolense</i> and <i>T. brucei</i>	<i>T. vivax</i> and <i>T. brucei</i>	
Akinyele	500	10	5	2	1	0	0	2	2.00%
Ibadan north	438	7	5	0	1	0	0	1	1.60%
Ibadan south	476	7	4	2	0	1	0	0	1.47%
Total	1414	24	14 (58.33%)	4 (16.67%)	2 (8.33%)	1 (4.17%)	0	3 (12.51%)	1.70%

The differences in prevalence rates between the present study and similar ones cited above may be associated with husbandry style, climate type and distribution of tsetse flies all over the country [20]. The observation of Ameen *et al.* [11] is particularly striking that within a State, there could be differences in the prevalence of trypanosomiasis in a single species of livestock. Apart from the fact that differences may exist in husbandry system, it may suggest that level of exposure between the two geographical locations within the State differ. The period of investigation also differ and it is possible that as at the time of the present study, more awareness about the disease have occurred, leading to a greater embrace of possible control measures such as fly control, chemoprophylaxis and chemotherapy. Information about the trend of purchase and application of available trypanocides within the three selected local government areas in Ibadan will be required to confirm this fact. The present study also showed that among the three species of trypanosomes i.e. *T. congolense*, *T. vivax* and *T. brucei*, infection by *T. congolense* was most predominant among the three. This observation is in agreement with the report of some researchers [11, 12, 21] but disagree with other reports which observed that natural infections with *T. vivax* are the most prevalent [8, 9, 22, 26]. Again the study showed that the prevalence of natural trypanosomiasis was highest (2.00%) in Akinyele local government and least (1.47%) in Ibadan South local government area. This difference again may be connected with the level of exposure and education as well as concentration of livestock among the different local government areas. Ibadan South Local governments has about the highest population of literates and although, the no of goats sampled here was more than in Ibadan north, the prevalence rate was lower (1.47%). Akinyele local government area harbours the largest cattle market in Ibadan and it may not be surprising that the highest rate of natural infection was observed there. Since *T. congolense* has been observed to be transmitted mechanically [27] by vectors other than Glossina, the socio economic importance of this species is further confirmed in that in spite of effective tsetse control its transmission could be sustained. This factor may have contributed to a higher prevalence of infection due to *T. congolense*. It may however be true also as earlier suggested [11] that *T. congolense* may be most adapted to development in the tsetse selected local government areas. With the mixed infections encountered during the

study, *T. congolense* and *T. vivax* accounted for 25% while *T. vivax* and *T. brucei* accounted for 75%. No infection between *T. congolense* and *T. brucei* was found. This result bears some similarity to an earlier report [8] in which two mixed infections due only to *T. vivax* and *T. brucei* in goats were found. In cattle however, equal prevalence i.e 7.1% was observed in mixed infections between *T. congolense* and *T. brucei* and *T. vivax* and *T. brucei* [3]. The present finding may suggest that the coexistence of *T. vivax* and *T. brucei* in Tsetse is more favoured by certain factors than any other combinations between the species in the selected areas for the study. Similarly, the observation that 8.33% of single infections was due to *T. brucei* and 75% of mixed infections was due to *T. vivax* and *T. brucei* is of zoonotic importance since domestic animals are reservoirs of *T. brucei gambiense* [28].

In conclusion, the presence of natural infections as single or mixed by the three species of trypanosomes in the three selected local governments areas in Ibadan, Oyo State, Nigeria shows that the vector (i.e. Glossina sp.) are endemic in the selected areas. Although the WAD goat has been reported to be resistant to trypanosomiasis [29], reports on trypanosomiasis in goats in Nigeria have been associated with reduced reproductive potential [30]. The present study therefore suggests that the status of trypanosomiasis in should be investigated in other communities and control programs should be embarked on. The study also establishes the prevalence of trypanosomiasis in female WAD goat does in the three selected local government areas within Ibadan, Nigeria and suggest that part of the reduced reproductive potential observed in the goats may be traced to trypanosomiasis.

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