

Preliminary Studies on Prevalence of Ruminant Trypanosomosis in Ogbomoso Area of Oyo State, Nigeria

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Abstract: This study investigated the prevalence of ruminant trypanosomosis in five local government areas of Ogbomoso in Oyo State, Nigeria. The animals investigated were West African Dwarf sheep, goats and cattle. The investigation started from November 2005 to October 2006 involving both rainy (May-Oct) and dry season (Nov-April) in all the five local government. The trypanosomes from the peripheral blood of animals were detected by wet blood film and stained thin film examination while haematocrit centrifugation technique was used to determine the packed cell volume (PCV). The total sum of 2080 (940 sheep, 675 goats and 465 cattle) animals were examined. The results of the investigation showed that 87 animals were infected with the Trypanosomes giving a prevalence rate of 4.1% in ruminants. *Trypanosoma congolense* was incriminated for all the infection. The prevalence rate in sheep, goats and cattle was 4.7%, 3.5% and 3.9% respectively and the infection was at $P < 0.05$ in dry season in sheep, goats and cattle than in the rainy season. This confirmed ruminant trypanosomosis is important in the study area.

Key words: Ruminant • Prevalence • Trypanosomosis

INTRODUCTION

Ogbomoso is one of the major towns in Oyo state and it lies on longitude 8°15 North East ward from Ibadan capital of Oyo state. The altitude is between 800-600mm above sea level and the mean annual temperature is about 27°C while that of annual rainfall is 1247mm. The vegetation of the study area is derived savannah [1]. There are five local governments in Ogbomoso area. These are Ogbomoso North, Ogbomoso South, Orire, Ogo Oluwa and Surulere, all in Ogbomoso land.

Typanosomosis is one of the major constraints to livestock productivity in Sub-Saharan Africa. Only trypanotolerant breeds survive, reproduce and remain productive without treatment in testse-infested area [2]. In West African, ruminants play a crucial role in providing protein (milk, meat) and non-food commodities (manure, hides). They equally serve as a cash reserve and a form of saving for rural population and as protection against agricultural failure, therefore, the number of animals is more important than individual productivity [3,4]. In the Sub-Saharan African, domestic ruminant population

composed of 162 million cattle, 127 million sheep and 147 million goats. Africa has 11% of the total world cattle population and 26% of the world small ruminant population. Eighty-two percent of the total livestock biomass in Africa is ruminant, thus the ruminant population forms the most important group on the continent [5].

Prevalence of trypanosomosis has been reported by various workers (using different diagnostic, parasitological and Elisa techniques). In the epidemiology studies of trypanosomosis in different part of Nigeria, a number of workers have reported different rate of prevalence. In Zaria, northern Nigeria, Ahmed and Agbede [6] reported 1.2% in goats, Kalu and Lawani [7] showed a prevalence rate of 1.2±1.6% in sheep and 0.7±1.3% in goats in Kano state Nigeria. Daniel *et al.* [8] reported a prevalence rate of 7.4 % in sheep and 5.0% in goats in Bauchi state. In the Eastern part of Nigeria, especially in Abakaliki the prevalence rate of 4.6% was reported for small ruminant but prevalence rate of sheep -6.7% and goats-3.5%. In Nsuka area, Fakae and Chiejina [9] reported 61.6% in small ruminant. In recent studies

across all agro-ecological zone in Nigeria, Onyia [10] reported a prevalence rate of 8.6% in sheep, 8.1% in goat and 10% in cattle while survey by EEC- trypanosomosis control project reported 4.3% in cattle, 1.6% in sheep and 1.0% in goats. These is dearth of information on the prevalence of ruminant trypanosomosis in Ogbomoso, therefore this study focuses on preliminary investigation of ruminant trypanosomosis in Ogbomoso area of Oyo state, Nigeria.

MATERIALS AND METHODS

The study was carried out in five local government area of Ogbomoso area of Oyo state, namely; Ogbomoso North, Ogbomoso South, Oriire, Surulere and Ogo Oluwa. The study was done during the rainy season (May-October) and dry season (Nov-April) in all the five local governments. These five local governments were chosen because of the availability of ruminants in the area and presence of some ponds which made the area more conducive for tsetse-animal contact. The animals investigated were peri-domestic West African Dwarf sheep, goat and cattle. Random sampling was employed in bleeding the animals. In a group, all the animals were bled, but where they are more than five, every other animal was bled. About 1 or 2ml of blood was collected from the jugular vein of each animal using EDTA as anticoagulant. Trypanosomes were detected using the haematocrit centrifugation of Woo [11], wet blood

film and stained thin blood smears. Parasites were examined by observing 60 fields of a wet film preparation microscopically (x10 eye pieces and x 100 oil immersion objective) for identification of trypanosomes species.

PCV was estimated using a haematocrit centrifuge and reader [12,13] and in all, some total of 2080 animals were investigated and examined.

Statistical Analysis: Student's t-test was used to analyze the results of the PCV of the infected and non-infected animals. The statistical significance of prevalence in both rainy and dry seasons for cattle, sheep and goats in all the five local governments was analyzed using chi-square test.

RESULTS

Out of 2080 goats, sheep and cattle examined, 87 were infected with trypanosomes, with total prevalence rate of 4.18%. *Trypanosome congolense* accounted for all the infections. 24 goats were infected out 675 examined with prevalence rate of 3.5%, 45 sheep were infected out 940 examined with prevalence rate of 4.7% while 18 cattle were infected out 465 examined with the prevalence rate of 3.9% (Table 1, 2 and 3). The results of the study showed that infection was significantly higher in sheep than goats and cattle in the area ($P < 0.01$) although there was no significant different at ($P > 0.01$) in goats and cattle.

Table 1: Prevalence of trypanosomosis in WAD Sheep in Ogbomoso area of Oyo State, Nigeria

LGA	No of animal Examined	No of animal Positive			% Prevalence
		T. congolense	T. Vivax	T. Brucei	
Ogbomoso North	200	15	0	0	7.5
Ogbomoso South	250	7	0	0	2.8
Oriire	198	10	0	0	5.1
Surulere	202	10	0	0	4.6
Ogo Oluwa	90	3	0	0	3.3
	940	45	0	0	4.7

Table 2: Prevalence of trypanosomosis in WAD goats in Ogbomoso area of Oyo State, Nigeria

LGA	No of animal Examined	No of animal Positive			% Prevalence
		T. congolense	T. Vivax	T. Brucei	
Ogbomoso North	170	8	0	0	4.7
Ogbomoso South	190	3	0	0	1.6
Oriire	90	4	0	0	4.4
Surulere	110	3	0	0	2.7
Ogo Oluwa	115	6	0	0	5.2
	675	124	0	0	3.5

Table 3: Prevalence of trypanosomosis in Cattle in Ogbomoso area of Oyo State, Nigeria

LGA	No of animal Examined	No of animal Positive			% Prevalence
		T. congolense	T. Vivax	T. Brucei	
Ogbomoso North	50	3	0	0	6.0
Ogbomoso South	60	3	0	0	5.0
Orire	120	4	0	0	3.3
Surulere	115	5	0	0	4.3
Ogo Oluwa	120	3	0	0	2.5
	465	18	0	0	3.9

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± Prevalence, Ruminant, trypanosomosis

Table 4: Seasonal Prevalence of trypanosomosis in WAD Goats in Ogbomoso area of Oyo State, Nigeria

LGA	Dry season		Nov-April		Rainy season		May-October	
	No animal examined	No positive	%Prevalence	No Animal examined	No positive	% Prevalence	No positive	% Prevalence
Ogbomoso North	70	5	7.1	100	3	3.0		
Ogbomoso South	99	2	2.0	91	1	1.1		
Orire	50	4	8.0	40	0	0.0		
Surulere	70	2	2.9	40	1	2.5		
Ogo Oluwa	85	4	4.7	30	2	5.7		
	374	17	4.5	301	7	2.3		

Table 5: Seasonal Prevalence of Trypanosomosis in WAD Sheep in Ogbomoso area of Oyo State, Nigeria

LGA	Dry season		Nov-April		Rainy season		May-October	
	No animal examined	No positive	%Prevalence	No Animal examined	No positive	% Prevalence	No positive	% Prevalence
Ogbomoso North	72	9	12.5	88	6	6.8		
Ogbomoso South	90	5	5.5	160	2	1.3		
Orire	100	7	7.0	98	3	3.1		
Surulere	170	7	4.1	32	3	9.3		
Ogo Oluwa	50	3	6.0	40	0	0.0		
	482	31	6.4	418	14	3.3		

Table 6: Seasonal Prevalence of Trypanosomosis in cattle in Ogbomoso area of Oyo State, Nigeria

LGA	Dry season		Nov-April		Rainy season		May-October	
	No animal examined	No positive	%Prevalence	No Animal examined	No positive	% Prevalence	No positive	% Prevalence
Ogbomoso North	35	3	5.6	15	0	0		
Ogbomoso South	40	3	7.5	20	0	0		
Orire	80	4	5.0	40	0	0		
Surulere	70	3	4.3	35	2	5.7		
Ogo Oluwa	80	2	2.5	40	1	2.5		
	305	15	4.9	150	3	2.0		

Table 7: Mean PCV of sheep, goats and cattle in Ogbomoso Area of Oyo State, Nigeria

LGA	WAD Sheep PCV%		WAD Goats PCV%		Cattle PCV%	
	Infected	Non-infected	Infected	Non-Infected	Infected	Non-infected
Ogbomoso North	16.5(5)	28(5)	13.0(5)	27.6(5)	20(3)	35(3)
Ogbomoso South	13.0(5)	27.5(5)	15.9(3)	27.0(5)	20(3)	33(3)
Orire	18.0(5)	27.5(5)	16.0(3)	27.5(5)	21(3)	33(3)
Surulere	11.0(5)	27.5(5)	11.0(3)	28.0(5)	20(3)	34(3)
Ogo Oluwa	13.0(3)	27.5(5)	12.5(3)	28.0(5)	21(3)	34(3)
	14.3 (23)	27.6(25)	13.7(17)	27.6(25)	20.4(15)	33.8(15)

The values in the parenthesis indicated the number of animals

The mean PCV values for non infected goats, sheep and cattle were 27.6%, 27.6% and 33.8% respectively while the values were 13.7% 14.3% and 20.4% for infected goats, sheep and cattle respectively (Table 7). In using students t-test, infection significantly decreased PCV ($P<0.01$ and $P<0.05$) of ruminant in the area.

In the study area of all the five local governments during dry and rainy seasons, the results showed that out of 374 goats examined in dry season, 17 were infected with prevalence rate of 4.5%, while out of 301 goats examined during rainy season, 7 were infected with prevalence rate of 2.3% (Table 4). Out of 482 sheep examined during the dry season, 31 were infected with prevalence rate of 6.4%, while out of 418 sheep examined during rainy season, only 14 sheep were infected with prevalence rate of 3.3% (Table 5). Out of 305 cattle examined during dry season, 15 cattle were infected with prevalence rate of 4.9%, while out of 150 cattle examined during rainy season 3 cattle were infected with prevalence rate of 2.0% (Table 6). Infection was found to be significantly higher in the dry season in all the ruminant ($P<0.05$) than in the rainy season.

DISCUSSION

Trypanosomosis is one of the major constraints for livestock productivity in sub-Saharan Africa [2]. The prevalence of trypanosomosis have been studied by various workers in all agro-ecological zones in Nigeria. In this study the total prevalence rate of 4.1% was shown for all ruminants in Ogbomoso area of Oyo State, Nigeria, while Prevalence rate of 4.7% in sheep, 3.5% in goats and 3.9% in cattle were observed, this rate is nearly similar to reports in Ebonyi state with prevalence rate of 4.6% but is not as high as in some reports in other parts of the Nigeria. In Gboko local government area of Benue state, prevalence rate of 51.6% was reported in sheep and 33.3% in goats [14], while in Nsukka area of Eastern Nigeria 13.6% was reported by Fakae and Chiejina [9] in both WAD sheep and goats.

In Zaria prevalence rate of 1.2% was reported [6]. In recent studies across all agro-ecological zones in Nigeria, Onyia [10] showed a prevalence rate of 8.6% in sheep, 8.1% in goats and 10.0% in cattle with *T. congolense* accounted for 15.6%, 6.3% and 18.2% for sheep, goat and cattle respectively. The differences in level of prevalence depend in a number of factors like husbandry practiced [15], the climate and presence of tsetse flies. In the study area, all the ruminants undergo pastoral management due to the fact that sheep, goats and cattle were grazed

together [16], so they were exposed to the same level of infection. Infection rate in WAD sheep is higher ($P<0.01$) than goats and cattle even though they were maintained under the same husbandry system.

The predominance of *T. vivax* infection had been reported by many epizootiological studies in Nigeria [17-21]. The reverse is the case in this study, *T. congolense* was the only trypanosomes that accounted for the infection. The reasons for this may be due to the fact that *T. congolense* may well be adapted to development in the tsetse flies in this region than others. The infection rate in the study in dry season was higher ($P<0.05$) than that of rainy season in all the ruminants. This agreed with Anosa *et al.* [18] in South western Nigeria, Kalu and Lawani [7] in Kano state, Nigeria and Agu and Amadi [21] in Ebonyi state, Nigeria. The reasons for higher prevalence in dry season in the present study could be due to presence of few ponds during dry season which were available for many animals to drink and immediate surrounding of the surviving ponds also provided enabling environments for the tsetse flies with the high result of the fly- animal contact. The similar situation was observed in Ebonyi state by Agu and Amadi [21], although *Trypanosoma vivax* was incriminated [21-23], which was contrary to what was observed in this study.

There was a significant differences ($P<0.05$) in the PCV of both infected and non-infected sheep, goats and cattle in the area of study. This conformed with report of Anosa *et al.* [24], Anosa, [25], Ogunsanmi *et al.* [26] that anaemia was a cardinal symptom of trypanosomosis. Poor nutrition and intercurrent gastro-intestinal helminth infection could also contribute to the general low PCV.

In the Southern part of Nigeria, ruminants are of great economic importance, particularly in Ogbomoso area. These animals serve as sources of income for their owners by selling them for use in traditional ceremonies such as funerals, marriages and other social functions. They serve as sources of animal protein and farm yard manure. With the prevalence rate of 4.1% and low PCV recorded during this investigation, this may constitute huge economic loss to the people in the areas. The efforts should therefore be made to do further investigation as the Ogbomoso area is one of the area that links the south western part to the Northern region.

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