



PREVALENCE OF *TRYPANOSOMA* INFECTION IN CATTLE IN THE TEACHING AND RESEARCH FARM (TREFAD), UNIVERSITY OF AGRICULTURE, ABEOKUTA, OGUN STATE, NIGERIA

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Abstract

The survey was conducted at the cattle unit of the Teaching and Research Farm (TREFAD), University of Agriculture, Abeokuta, Capital city of Ogun state in the South-west Nigeria. Samples were collected from 49 cattle comprising of Three pure breeds and Three cross breeds. Forty-two were females (85.7%), while seven were males (14.3%). The breeds were Seventeen White Fulani (34.7%), Fifteen Muturu (30.6%), Nine Ndama (18.4%), Five white Fulani and Muturu crosses (10.2%), Two Ndama and White Fulani crosses (4.1%), One Muturu and Ndama crosses (2.0%). Thirty-three cattle were infected with hemoparasites while eleven cattle were not infected with hemoparasite. The research shows that prevalence of *Trypanosoma* infection was 0%. The zero percent recorded was attributed to the fact that TREFAD is an institutional farm; veterinary supervision is adequate, which may lead to the appropriate use of drugs or use of drugs of standard quality. The survey also shows that other hemoparasite such as *Anaplasma*, *Babesia* and *Theileria* were prevalent in TREFAD with *Babesia* being the most prevalent (57.1%). There was a significant difference between the packed cell volume (PCV) and within the group using 95% confidence interval with significant level of ($p < 0.05$). There was a variation in the RBC of the infected cattle, as cattle with hemoparasite infection have a lower RBC compared to the non- infected cattle.

Key Word: Prevalence, *Trypanosoma*, Infection, Cattle, Research Farm, Abeokuta.

1. Introduction

African trypanosomiasis is a complex, debilitating and zoonotic protozoan disease of man and animals. This disease is found in many regions of the world, but mainly in sub-Saharan Africa between latitude 14°N and 29°S (WHO, 1998). It is estimated that about 60 million people (WHO, 1998) and 48 million cattle (Kristjanson *et al.*, 1999) are at risk of contracting African trypanosomiasis from the 23 species and 33 subspecies of tsetse flies infesting 10million km² of Africa stretching across 40countries. African trypanosomiasis is responsible for 55,000 human, 3 million livestock deaths annually (Abenga *et al.*, 2002; Samdi *et al.*, 2010a) and hinders mixed farming through reduced work efficiency of draft animals. The disease is caused by trypanosomes, protozoa of the genus *Trypanosoma*. The *Trypanosoma* species of economic importance in cattle are *Trypanosoma congolense*, *T. vivax* and *T. brucei*.

The disease in animal is called Animal African Trypanosomiasis (AAT) while it is referred to as Human African Trypanosomiasis (HAT) or sleeping sickness in Humans. The disease is mainly controlled by chemotherapy in animals. Trypanosomes have continued to be a menace in the livestock industry in Nigeria despite the age long attempt to control the disease. The disease has received attention more in organized farms than in domestic and peridomestic animals. However, apart from the organized Fulanis, government and some large individual farms, the majority of Nigerian livestock are kept within or around homestead. It is therefore very important to intensify surveillance and treatment of trypanosomiasis in these animals as well as in those that are reared primarily outside the human settlement (NIT, 1980-1983).

In many areas endemic for trypanosomiasis such as in Nigeria, the epidemiology of the disease is poorly understood. Animal trypanosomiasis is also recognized as a major health problem in Nigeria. It is responsible for about 80% of Nigeria landscape being unsuitable for livestock production (Ugochukwu, 1983). In Nigeria, studies have been carried out in many areas especially in the North and central Nigeria (Kalu and Lawani, 1996; Kalu *et al.*, 1991, 2001).

The prevalence of trypanosome infection in trade cattle at Lafenwa abattoir has been studied by Okwelum *et al.*, (2011). However, in some areas such as Odeda (Abeokuta environ), the study of the epidemiology of the disease is lacking. Also, the status of the disease in the Teaching and Research farm University of Agriculture Abeokuta (TREFAD) needs to be updated since the disease is infectious and can easily be transferred from an infected herd to a healthy herd via tsetse bite. The lack of an update on the disease prevalence in Odeda area, the economic importance of the disease especially the risk it poses to humans and other livestock calls for the need to study its prevalence in TREFAD so as to put adequate measure in place to forestall the effect on both man and animal in the community. Therefore this study was

aimed at studying the Prevalence of Trypanosome infection in cattle in TREFAD, Federal University of Agriculture, Abeokuta, Nigeria.

2. Materials and Methods

2.1 Study Area

The study was conducted at cattle unit of the Teaching and Research farm (TREFAD), University of Agriculture Abeokuta. Abeokuta is the capital city of Ogun State in South-west Nigeria, situated at 7°09'39" N, 3°20'54" W and it is 76m above sea level and falls within the rainforest vegetation zone of south-western Nigeria (Google earth, 2006).

2.2 Sampling

Blood samples were collected from each animal in the cattle unit. Before the collection of blood samples, sex breed and temperature of the animals were recorded. Five millilitres (5ml) of blood were collected via the jugular vein using vacuum Ethylene Diamine Tetraacetic Acid (EDTA) kits labelled. Samples were immediately conveyed in a cold-box to the Parasitology laboratory in the College of Veterinary Medicine, FUNAAB, Abeokuta for processing and examination.

2.3 Examination of the Samples for Blood Parasites

The blood samples were processed and examined using thin blood smear method and micro-haematocrit centrifugation technique (Woo, 1970) and buffy-coat smear for detecting the presence of blood parasites. Isolates were identified based on morphological and biometrical data, according to Hoare (1972).

2.4 Packed Cell Volume (PCV): This was determined using the micro-haematocrit centrifuge and reading done using a PCV Reader.

2.4 Blood Cells Count

The red blood cell (RBC) and total white blood cell (WBC) counts were obtained using Neubauer Chamber. The differential blood counts were determined as proportion of different types of leucocytes (WBC) on the blood smear and were expressed in percentages.

2.5 Statistical analyses

Animals were grouped according to the parasite species identified from their blood and expressed as percentages of the total to show the prevalence rate for each parasite species. Prevalence rates were expressed in a descriptive statistics. Groups were then subjected to Analysis of Variance (ANOVA) using Statistical Package for Social Sciences (SPSS).

3. Results and Discussion

Samples were collected from 49 cattle comprising 3 pure breeds, and 3 cross breeds. 42 were female (85.7%) while 7 were male (14.3%). The breeds were 17 white Fulani (34.7%), 5 White Fulani and Muturu (10.2%), 15 Muturu (30.6%), 9 Ndama (18.4%), 2 Ndama and White Fulani (4.1%), 1 Muturu and Ndama (2.0%).

Table 1: Shows the frequency and percentage of hemoparasite infection amongst the various breeds of cattle.

Parasite	Frequency	Percentage
Non parasite species	11	22.4
<i>Babesia bovis</i>	28	57.1
<i>Anaplasma marginale</i>	8	16.3
<i>Anaplasma & Babesia species</i>	1	2.0
<i>Theileria annulata</i>	1	2.0
<i>Trypanosoma species</i>	0	0
Total	49	100.0

From the table 1: A total of 49 cattle were sampled and none was found to be infected with trypanosome. A total of 38 animals were found to be infected with other blood parasites. 28 cattle were infected with *Babesia* (57.4%), 8 cattle were infested with *Anaplasma* (16.3%), 1 cattle was infested with both *Anaplasma and Babesia* (2.0%), 1 cattle was infected with *Theileria* (2.0%), while 11 was free from blood parasite infection (22.4%). The percentage prevalence was as follows: *Babesia* (57.1%), *Anaplasma* (16.3%), *Anaplasma and Babesia* (2.0%), *Theileria* (2.0%), *Trypanosoma specie* (0%). *Babesia* is seen to have the highest prevalence.

Table 2: Shows the relationship between breed and hemoparasite infection using cross tabulation

BREED	NPS	<i>Babesia species</i>	<i>Anaplasma Babesia</i>	<i>Anaplasma</i>	<i>Theileria</i>	Total
WF	1		1	1	0	17
WF & M	2	3	0	0	0	5
M	3	9	0	2	1	15
N	4	1	0	4	0	9
N & WF	1	0	0	1	0	2
M & N	0	1	0	0	0	1
Total	11	28	1	8	1	49

KEY: N= Ndama; WF= White Fulani; M= Muturu; NPS= Non parasite species

Table 2: Shows that *Babesia* infection is found in 28 animals (57.1%) has the highest prevalence with White Fulani having the highest susceptibility.

Table 3: Shows the mean and std. deviation of the various Breeds in relation to Body temperature, Hemoparasite, PCV, WBC and RBC

BREED	Body T ^o C	HEMOPARASITE	PCV	WBC	RBC
WF	38.5294	2.12	26.9412	7.5941	4.9647
MEAN	17	17	17	17	17
	.36702	.600	4.66999	1.82739	1.42344
N					
STD.D					
WF	38.2800	1.60	35.4000	6.5800	6.5800
MEAN	5	5	5	5	5
%	.58907	.548	2.30217	1.57861	1.57861
N					
M					
STD.D					
M	38.2600	2.27	30.9383	8.8800	6.2867
MEAN	15	15	15	15	15
	.44689	1.163	3.34086	2.73788	1.57701
N					
STD.D					
NDAMA	38.2444	2.44	32.7778	7.7667	6.5667
MEAN	9	9	9	9	9
	.45031	1.509	3.73424	2.55098	1.45086
N					
STD.D					
NDAMA	38.6000	2.50	29.5000	7.7500	6.5000
MEAN	2	2	2	2	2
&	0.000	2.121	.70711	4.03051	1.97990
N					
WF					
STD.D					
M	37.2000	2.00	35.00	5.8000	9.1000
MEAN	1	1	1	1	1
%	-	-	-	-	-
N					
NDAMA					
STD.D					
TOTAL	38.3449	2.18	30.3673	7.8857	6.1061
MEAN	49	49	49	49	49
	.46100	1.034	4.6679	2.35390	1.6961
N					
STD.D					

KEY: WF= White Fulani; PCV= Packed cell volume; BC= White blood cell; M= Muturu ; RBC= Red blood cell; N= Ndama

From table 3: The total mean body temperature and std. deviation of all the cattle Breeds is 38.3449±.46100, the total mean hemoparasite and standard deviation is 2.18±1.034, the total mean PCV and standard deviation is 30.367±4.6679, the mean WBC and standard deviation is 7.8857±2.35390 and the mean RBC and standard deviation is 6.1061±1.6961.

Out of the observed animals, 7 had a PCV of 30, 6 had a PCV of 29, 5 had a PCV of 35 while 1 had a PCV of 39 and mean PCV value of the study also resulted in 30.3673. Statistically significant difference ($p < 0.05$) in mean PCV was observed using 95% confidence interval with significant level of 0.05. There was no significant difference between the age group and hemoparasite, PCV, WBC and RBC using 95% confidence interval with significant level of 0.05. There was no significant difference between sex and hemoparasite prevalence, PCV, WBC, AGE GROUP and Body temperature using 95% confidence interval with significant level of 0.05.

There was a significant difference between the RBC and Breed using 95% confident interval with significant level of $P < 0.05$. There was a significant difference between PCV and hemoparasite using 95% confidence interval with significant level of $P < 0.05$.

3.1 Discussion

The prevalence of bovine trypanosome infection in the TREFAD is 0% which shows the status of the farm as no previous finding has been made. The zero prevalence of trypanosome can be attributed to the fact that TREFAD is an institutional farm hence; Veterinary supervision is adequate, which may have led to the adequate use of drugs. There was a significant difference between PCV within the group using 95% confidence interval at significant level ($p < 0.05$). There was a variation in the RBC of the infected cattle. As cattle with hemoparasite infection have a low RBC compared to non hemoparasite animal. There were no significant differences between body temperature of sex and within the group. There were no significance differences between the Age group and the body condition of the Animal. Hemoparasite infection did not depend on age, as animal of different ages are susceptible to hemoparasite infection.

4. Conclusion

From the study it is possible to conclude that trypanosomosis is not a potential threat to the health and productivity of cattle in TREFAD as it is under control. The blood parasites encountered in the area of study were *Babesia*, *Anaplasma* and *Theileria*. This indicates that the reduction in RBC count may be due to other Hemoparasite. This makes the cattle to be anaemic and loss in body conditions. In Nigeria, cattle are considered as one of the principal livestock, and their survival and development are necessary to ameliorate the worsening situation regarding the supply of animal protein. Cattle production in the country has been restricted to the northern part because of the fact that the south-west (forest zone) is highly infested with tsetse flies which transmit trypanosomosis. The result shows that intensive commercial production of cattle coupled with good management could be encouraged and high cattle production is achievable on this Farm under therapeutic control of trypanosomosis in cattle.

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