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Incidence of trypanosomes among White Fulani and Sokoto Gudali breeds of cattle in Niger state, Nigeria

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Abstract

The incidence of trypanosomes was investigated among cattle herds of white Fulani and Sokoto Gudali breeds in six out of twenty five Local Government Areas of Niger State within a period of six months covering May - October, 2007. Blood samples from 300 heads of cattle selected randomly from the Fulani herds were screened for Trypanosomes using a thin blood smear and haematocrit centrifugation techniques at the State Veterinary Centre, Bosso, Minna. The result revealed that the white Fulani breeds of cattle had higher incidence of Trypanosomes compared to Sokoto Gudali breeds representing 38.2 and 28.2% for white Fulani and Sokoto Gudali breeds respectively with an overall incidence of 6.3 %. It is clearly evident that the study area is endemic for trypanosomosis as such, effective control programme by way of prophylactic treatment is recommended.

Keywords: Niger state, Sokoto Gudali, Trypanosomes, White Fulani

Introduction

Trypanosomes are microorganisms that belong to the protozoan group. They are flagellated protozoan that swim actively in the blood and body fluids of their hosts. According to Gilbert *et al.*, (1999), trypanosomes are insect borne and their epidemiology is determined by the ecology of their vectors. The parasites undergo part of their life cycle in tsetse fly and are mostly limited to Africa.

Trypanosoma vivax, *Trypanosoma congolensis*, *Trypanosoma brucei* and *Trypanosoma simiae* are the four main species responsible for Africa trypanosomosis (Luckin, 1992). However, *Trypanosoma vivax* and *Trypanosoma congolensis* are the most economically dominant species in the areas where the disease occur (Swallau, 2000). The effect of trypanosome on animals include anaemia, retarded growth, low milk production, weight loss, infertility and still birth.

There are about 15 million cattle heads in Nigeria managed under traditional husbandry system and about 90% of these population are concentrated in the Northern region of the country, mostly around the North-west areas of Sokoto, Kebbi, Zamfara and Niger States; and North-East areas of Maiduguri, Potiskum, Yola and Bauchi (Turay *et al.*, 2005).

The epidemiology of trypanosomosis has become complex as a result, the causative agent has continued to wax strong in the sub-saharan Africa causing death of millions of cattle (Leeflag, 1974). Similarly, the Nigerian Institute for Trypanosomosis Research, Kaduna had received reports of outbreaks of animal trypanosomosis which resulted in deaths of cattle with yearly migration of the semi-nomadic fulanis out of Lere Local Government Area in Kaduna State during the raining season (Abenga *et al.*, 2000). The report shows that in a Fulani herd located 1 km away from Saminaka, 124 out of 150 (83%) animals were reported to have died in a space of three years. During a spot survey, the remaining 36 animals examined and were all found to be infected with *Trypanosoma vivax*. A similar study carried out by Omotainse *et al.* (2005) in Konshisha Local Government Area of Benue State involved a randomly sampled 163 cattle out of which 68 (41 .7%) were positive for trypanosomes.

It is in the light of this challenges that this study seeks to investigate the incidence of trypanosomes among the two predominant breeds of cattle found in Niger State.

Materials and Methods

Niger state lies between latitude 8°00'and 11°30'N and longitude 3°20' and 7°40'E. The state is bounded by Kog state in the South, in the South-west by Kwara state, in the South East by the Federal Capital Territory, in the north East by Kaduna while in the North, it is bounded by Sokoto and Kebbi states. The total land area of Niger State is estimated at 74, 222sqkm.

This study covered six Local Government Areas of Gurara, Paikoro, Chanchaga, Shiroro, Rafi and Bosso out of Twenty-five Local Government Areas of the state. The Local Government Areas under study were chosen based on their proximity to the state's boundary with Kaduna state where several cases of trypanosomosis have been reported in the past (Abenga *et al.*, 2000).

Blood samples were collected from 50 cattle each that were randomly selected from the Fulani herds in each of the selected Local Government Areas. The major breeds examined were the Bokolo (Sokoto Gudali) and the White Fulani which are predominant in the selected Local Government Areas.

Herds were visited once for sample collection. Blood samples were collected in the morning at about 8:00 am before the animals were released for grazing. 5mls of blood were collected through jugular vein of each animal, the samples were kept in EDTA bottles and conveyed in cold boxes with ice packs from the fields to the Veterinary Centre, Bosso, Minna for laboratory analysis using thin blood smear and Haematocrit centrifugation techniques respectively (Woo, 1970).

The data collected were subjected to descriptive statistical analysis. Chi-square test was also used to test the independence of location and the incidence of trypanosomes in cattle.

The hypothesis is stated as H_0 if incidence of trypanosomes in cattle is independent of location and H_1 if it is not independent of location (Bello and Ajayi 2000).

Results and Discussion

Table 1.0 shows herd locations within the six Local Government Areas of study where positive blood samples for trypanosomes were recorded. The study recored an incidence of 19 (6.3 %) representing 38.2% and 28.2% for White Fulani and Sokoto Gudali respectively.

Table 1: Overall incidence of trypanosomes in cattle examined from the selected locations in Niger State

LGA	Location	Cattle Breed (%*)			Positive	
		Sokoto Gudali	White Fulani	Total	Number	%**
Gurara	Diko	7	8	15	1	6.67
	Lambata	10	10	20	2	10
	Izom	8	7	15	0	0
Paikoro	Tunga Mallam	13	12	27	1	3.7
	Paiko	6	7	13	0	0
	Farin Doki	5	5	10	1	1
Chanchaga	Chanchaga	8	7	15	0	0
	Tunga Goro	7	8	15	0	0
	Kpata	10	10	20	0	0
Shiroro	Kuta	5	5	10	0	0
	Gwada	10	10	20	3	15
	Erena	10	10	20	5	25
Rafi	Pandogari	5	5	10	1	10
	Kusherki	10	10	20	2	10
	Gunna	10	10	20	0	0
Bosso	Bosso	5	5	10	0	0
	Beji	10	10	20	2	10
	Pyata	10	10	20	1	5
	TOTAL	150(28.2*)	150(38.2*)	300	19	6.3***

* = Incidence rate per breed
** = Incidence rate per location
*** = Overall incident rate

Table 2: Distribution of trypanosomes in the two breeds of cattle examined in Niger State

Local Government	Sokoto Gudali	White Fulani	Total positive
Gurara	1(4%)	2(8%)	3
Paikoro	1(4.2%)	1(4.2%)	2
Chanchaga	0(0%)	0(0%)	0
Shiroro	3(20%)	5(8%)	8
Rafi	1(4%)	2(20%)	3
Bosso	1(4%)	2(8%)	3
Total	7	12	19

Table 3: Test of independence of incidence of trypanosomes in cattle different locations in the study area

Locations (Variable)	X^2 cal	df	P value	Decision
Gurara	1.537	2	0.464	NS
Paikoro	1.485	2	0.476	NS
Chanchaga	0	0	0	0
Shiroro	3.126	2	0.210	NS
Rafi	0.946	2	0.623	NS
Bosso	0.521	2	0.771	NS

NS = not significant at 0.05 level

The result portends great implications for livestock production particularly for white Fulani cattle whose incidence to trypanosomes translates to 38.2% of the total population screened. The implications of bovine trypanosomosis has earlier been reported (Payne, 1990), indicating that white Fulani dominates the Nigerian cattle population and that 75% is concentrated in Northern states with only 25% in South. The outcome was also justified by earlier finding (Omotainse *et al*; 2005), that as a result of the urgent need for livestock to provide first class protein in the diet of African population, attention need to be directed to the control of trypanosomes, the causative agent of trypanosomosis, such that the cattle population is not adversely affected by it.

Table 1.0 and 2.0 shows incidence rates obtained in each of the six Local Government Areas of study for White Fulani to be; Gurara (4%), Paikoro (4.2%), Chanchaga (0%), Shiroro (12%), Raffi (4%) and Bosso (4%). For Sokoto Gudali; Gurara (8%), Paikoro (4.2%), Chanchaga (0%), Shiroro (20%), Rafi (8%), and Bosso (8%). The low incidence rates observed in Bosso and Chanchaga Local Government Areas may be due to the preventive and curative treatment of animals as earlier reported in previous studies in Niger State (Adama *et al*., 2009).

The high incidence rates observed in relation to the neighbouring states where similar studies have been conducted supports the views of (Leeflag, 1974), that the epidemiology of trypanosomosis has become complex as a result, the causative agent has continued to wax stronger in the sub-Saharan Africa causing the death of millions of cattle.

The chi-square test was presented in table 3.0. It indicates that the test is not significant at 0.05 level, as such we do not reject H_0. We therefore, conclude that the location of the animals do not have influence on the incidence of trypanosomes. Conversely, however, Shiroro Local Government Area shows higher incidence of trypanosomes to be 20 and 25% for white Fulani and Sokoto Gudali breeds respectively.

The higher incidence observed in the riverine areas of the state (Shiroro LGA), may be attributed to the conducive environment in this area for riverine species of tsetse flies such as palpalis to trive thereby influencing disease transmission (Rogers and Randolph, 1993).

Conclusion

The incidence rate of trypanosomes was found to be higher in white Fulani breeds of cattle as compared to the Sokoto Gudali breeds in the study area. Therefore, since Niger State serves as a route for pastoralists from the far north moving south wards in search of water and pasture, this seasonal movement may tend to promote the spread of trypanosomosis particularly among the white Fulani breeds which is the predominant breed in Northern Nigeria. Adequate preventive measures by way of regular sensitization of livestock farmers through preventive management practices organized by qualified Veterinary personnel as well as the application of Veterinary best practices in the state would help in reducing the incidence of trypanosomosis infection.

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