

KNOWLEDGE, ATTITUDE AND TREATMENT PRACTICES ASSOCIATED WITH THE CONTROL OF AFRICAN ANIMAL TRYPANOSOMIASIS AMONG FULANI CATTLE HERDERS IN SELECTED AREAS OF ENUGU STATE, NIGERIA

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ABSTRACT

The study assessed the knowledge, attitude and practices of Fulani cattle herders in relation to the control of African Animal Trypanosomiasis (AAT) in selected areas of Enugu State, Nigeria. Interviews and administered questionnaires were used to collect information on knowledge, control and treatment practices associated with AAT and tsetse from 49 cattle herders. Results showed that all the respondents have knowledge of tsetse and AAT. Most of them (98.0 %) know that the disease is transmitted by tsetse fly, which bites more in the rainy season and in the morning and have higher densities by the river banks. Majority (87.8 %) treats their animals with trypanocides when infected and use locally made herbal insecticides to control the flies. The study has established that the respondents have good knowledge of the AAT and tsetse, as important factors in disease control and treatment. However, the misuse and unsystematic use of some conventional trypanocidal drugs by the herders is reported to be one of the predisposing factors for the development of drug resistance which has become a menace in the control of the disease. In conclusion, more sensitization among herders on the control and treatment of AAT is needed. Researchers need to tap into the knowledge of the use of locally found herbs in the control of tsetse and AAT, and explore and exploit the knowledge gained for the development of insecticides for tsetse and novel drugs for AAT.

Keywords: Tsetse fly, African animal trypanosomiasis, Knowledge, Attitude, Practice, Treatment, Control

INTRODUCTION

Trypanosomes are protozoan parasites transmitted by blood sucking insects of the Genus: *Glossina* commonly known as tsetse fly. Trypanosomes cause the disease African trypanosomiasis in both man and animals, including; cattle, goats, sheep and pigs (Onyekwelu *et al.*, 2017). The disease is highly fatal in both animals and humans if left untreated (Enwezor and Ukah, 2000). African animal trypanosomiasis (AAT) is endemic in 37 countries in Africa, covering over 10 million km², an area that corresponds approximately to one-third of the Continent's total land area. The

disease is estimated to threaten about 147 million cattle with an annual economic loss in sub-Saharan Africa estimated at about US\$ 5 billion and it is considered by Africa's Heads of State to be one of Africa's AAT has been known to impede the socio economic development of many countries in sub Saharan Africa (Isaac *et al.*, 2017). Recently, an estimate of livestock Nigeria was given as 19.5 million cattle, 72.5 million goats, 41.3 million sheep, 7.1 million pigs, 28,000 camels and 974,499 donkeys. However, majority of these livestock are at risk of AAT infections because they are located within tsetse infested belts (Meyer *et al.*, 2016; Isaac *et al.*, 2017). The production losses in

cattle due to trypanosome infections have been estimated to be up to 20 % across a range of parameters, including mortality, calving rate, draft power, meat and milk production (Swallow, 2000). In animals, the disease causes low fertility, poor growth of the young, low milk production, poor carcass quality and high mortality (Cattand *et al.*, 2006). The major source of animal protein for most Nigerians is beef derived from cattle. African trypanosomiasis has been found to decrease population of livestock by causing death, reduces productivity and consequently reduces protein availability (Odeniran and Ademola, 2018). Chemotherapy and chemoprophylaxis remain the most major aspects of control and eradication of trypanosomiasis. However, before the advent of orthodox medicine, traditional methods were employed by herdsmen and locals in the treatment and control of trypanosomiasis and tsetse flies. This study was conducted to assess the knowledge, attitude and practices associated with AAT among Fulani herdsmen in selected areas of Enugu State, Nigeria.

MATERIALS AND METHODS

Study Area: The study was carried out in four Local Government Areas of Enugu State, namely: Nkanu East, Enugu South, Enugu East and Udi. It covers an area of 7,161 km² and has 2022 projected population of 4,411,119 persons (Wikipedia, 2019a). The state shares boundary with Abia, Imo, Ebonyi, Benue, Kogi and Anambra States. The temperature in Enugu State in the hottest month of February is about 87.16 °F (30.64 °C), while the lowest temperatures occur in the month of November, reaching 60.54 °F (15.86 °C). The lowest rainfall of about 0.16 cubic centimetres (0.0098 cu in) is in February, while the highest is 35.7 cubic centimetres (2.18 cu in) in July. The vegetation is that of a semi Savannah which is good for livestock grazing (Wikipedia, 2019b).

Ethical Considerations: An ethical approval was sorted and obtained from the Research Ethical Committee of the Nigerian Institute for Trypanosomiasis Research, Enugu, Nigeria.

Study Population: The study design was a cross sectional survey involving males and females Fulani's (120) who are settlers in the study areas. The males, who were more in number, were predominantly cattle rearers, although some are traders, while the females are predominantly traders who sell locally made cheese and fresh cow milk. This study was carried out within a period of one month (June 15 – July 14, 2019). All those who are males, rear cattle, of Fulani extraction and not below 15 years of age in the study population were included in the study.

Sampling Method: Four LGAs, Nkanu East, Enugu South, Enugu East and Udi were randomly selected by balloting from a sampling frame of 17 LGAs which make up Enugu State. Four clusters of Fulani settlement (a cluster per LGA), with a mean population of 30 persons in each cluster which served as the study population in the selected LGAs were sampled. All who met the inclusion criteria in each cluster (15 herders in each cluster) were included in the study.

Data Collection: Data was collected from the study subjects using a structured closed ended and pre-tested questionnaire. Those who could not read or write were guided by the researcher to respond to the questionnaire. Two members of the research team who speaks Hausa fluently served as interpreters where the respondents do not understand the English language or Pidgin English. The questionnaire contains questions on socio-demographic characteristics, knowledge, attitude and practice associated with African animal trypanosomiasis.

Data Analysis: Data obtained from this study were descriptively analyzed using Statistical Package for Social Sciences (SPSS) version 21.0. Results were presented in frequencies and percentages.

RESULTS

A total of 49 respondents took part in the study with ages 15 – 24 years 1(6.10 %), 25 – 34 years 18(16.3 %), 35 – 44 years 11(36.7 %),

45 – 54 years 7(22.4 %), 55 – 64 years 2(14.3 %) and 65 years and above 2(4.1 %). Among the respondents, 45(91.8 %) persons had no formal education, 3(6.1 %) had primary education and 1(2.0 %) had secondary education. Their marital status indicated that 10(20.4 %) were single and 39(79.6 %) were married (Table 1).

Table 1: Socio demographic characteristics of Fulani cattle herders in selected areas of Enugu State, Nigeria

Variable	Frequency	Percentage (%)
Age		
15-24	1	6.1
25-34	18	16.3
35-44	11	36.7
45-54	7	22.4
55-64	2	14.3
65 and above	2	4.1
Educational status		
Non – formal	45	91.8
Primary	3	6.1
Secondary	1	2.0
Marital status		
Single	10	20.4
Married	39	79.6
Duration of stay		
Below 1 year	1	2.0
Above 1 year	48	98.0

All respondents know about tsetse. 41(83.7 %) persons know the local name for tsetse fly as *Tsando* in Hausa. Equally, 41(83.7 %) of the respondents know the local name for African animal trypanosomiasis (AAT) as *Samore* in Hausa. Interestingly, 48(98.0 %) respondents have knowledge that the disease is transmitted by tsetse. A total of 46(93.9 %) of the respondents attested of the presence of tsetse fly in their respective settlements and 48(98.0 %) of them claimed they have been bitten by the fly. They all claimed the flies bite their cattle. When asked about the seasonal variation in fly bite, 37(75.5 %) responded that the flies bite more during the raining season. On daily biting pattern, 26(53.1 %) persons said that the fly bites in the morning, 18(36.7 %) said it bites in the afternoon and 5(10.2 %) claimed that it bites at any time of the day. With regards to habitat with more bites, 38(77.6 %) of the respondent indicated more bites occurs around the river bank (Table 2).

Table 2: Knowledge of the Fulani cattle herders associated with the control of African animal trypanosomiasis in selected areas of Enugu State, Nigeria

Variable	Frequency	Percentage (%)
Knowledge of Tsetse fly		
Yes	49	100.0
No	0	0.0
Awareness of tsetse fly bites		
Yes	49	100.0
No	0	0.0
Local name for tsetse fly		
Tsando	41	83.7
Bebeji	7	14.3
Loji	1	2.0
Knowledge of disease transmission by tsetse flies		
Yes	48	98.0
No	1	2.0
Local name for AAT		
Samore	41	83.7
Kufu	7	14.3
Tsando	1	2.0
Presence of tsetse fly in the area		
Yes	46	93.9
No	3	6.1
If bitten by tsetse flies		
Yes	48	98.0
No	1	2.0
Are cattle bitten by tsetse flies?		
Yes	49	100.0
No	0	0.0
Season of the year the flies bite more?		
Rainy	37	75.5
Dry	11	22.4
Always	1	2.0
What time of the day thus tsetse flies bite more?		
Morning	26	53.1
Afternoon	18	36.7
Anytime	5	10.2
Where they do bite more		
River bank	38	77.6
Open field	11	22.4
Total	49	100.0

On control and treatment practices associated with AAT, 43(87.8 %) respondents treated their cattle when infected using conventional drugs. 36(73.50 %) responded that they treated their cattle using herbs and 12(24.5 %) of them used the plant Male (*Khaya grandifoliola* C.DC., Sapindales: Meliaceae), 1(2.0 %) used Namijin Kadanya (*Lophira lanceolata* Tiegh. ex Keay, Malpighiales: Ochnaceae), while 36(73.5 %) did not respond. The results revealed that 13(26.5 %) claimed the plant materials for the

treatment of their animals were prepared as decoction, while 36(73.5 %) did not respond (Table 3).

Table 3: Attitude and treatment practices of the Fulani cattle herders associated with the control of African animal trypanosomiasis in selected areas of Enugu State, Nigeria

Variable	Frequency	Percentage (%)
What do you do when infected?		
Nothing	29	59.2
Treat	3	6.1
Scratch	2	4.1
No response	15	30.6
What do you do when a cow or bull is infected?		
Treatment with conventional drugs	43	87.8
Treatment with herbs	2	4.1
Treatment with both	1	2.0
Nothing	1	2.0
No response	2	4.1
Is there any treatment option?		
Yes	49	100.0
No	0	0.0
If 'yes', which treatment option?		
Traditional	36	73.5
Orthodox	13	26.5
If traditional, what is/are the name(s) of the plant(s) used for the preparation?		
Non-response	36	73.5
Male (<i>Khaya grandifoliola</i>)	12	24.5
Namijin Kadanya (<i>Lophira lanceolata</i>)	1	2.0
How do you prepare the plant material(s) for treatment?		
Non-response	36	73.5
Decoction	13	26.5
Is there any means of preventing the flies from biting?		
Yes	43	87.8
No	6	12.2
If 'yes', what means?		
Insecticides	47	95.9
Move cattle away from infested sites	2	4.1

DISCUSSION

The findings from this study showed that all of the respondents were aware of the tsetse fly and most of them know that the vector exist in that area and can transmit disease. Also,

majority of the respondents know the name of tsetse fly in Hausa language (*Tsando*) and the disease (*Samore*). They also know that the fly bites more during the rainy season, especially by the river side, where they water their animals. These findings are similar to that of a study carried out in Kaduna in which majority of the respondents are aware of the presence of tsetse fly and know that the vector is common during the rainy season when their population increases (Osue *et al.*, 2018).

A notable observation from the findings of this research is that most of the respondents would do nothing when they are infected with trypanosome, but will treat their cattle with drugs when the cattle are infected. This is probably due to cultural beliefs associated with the Fulani pastoralists, in which more value is placed on their cattle. Most respondents in this study believe that there are treatment options for AAT, however not all use conventional drugs for treatment, less than half of the respondents still use traditional herbal drugs for treatment. This however, does not support the report that many people in developing countries still rely on medicinal plants and traditional healing practices for daily healthcare needs of their animals in spite of advancement in orthodox medicine (Ojewole, 2004). But, similar to these findings is that of Osue *et al.* (2018) in which only a few respondents (20 %) use traditional treatment methods in treating their livestock in the past, and also claimed to have abandoned the practice for its assumed ineffectiveness. Since cattle herders have come to accept these conventional drugs for AAT, there is the tendency to abuse the use of these drugs either by over dosing or under dosing the animals with the drugs. The misuse and unsystematic use of these conventional trypanocidal drugs by pastoralists has been reported to be among the predisposing factors for the development drug resistance to the disease (Laxminarayan *et al.*, 2006; Zaman *et al.*, 2017).

Medicinal plants commonly used by the respondents for treatment of AAT were Male, Namijin Kadanya and Gambaje (*Hyphaene thebaica* (L.) Mart., Arecales: Arecaceae). However, most respondents are unwilling to go into details on herbal preparatory method. This

attitude was also reported in previous studies, in which there was difficulty in obtaining information on ethno-veterinary practice from livestock farmers who view question on ethno-veterinary practice as probing into family guided secret thereby exhibiting unwillingness to disclose how they treat livestock (Nalule *et al.*, 2011; Osue *et al.*, 2018). Most of the respondents (87.8 %) in this study affirmed that tsetse flies can be controlled. Common methods of controlling tsetse fly mentioned by the respondents are by the use of insecticides, burning of leaves to release smoke that chase away the flies and keeping the cattle in fly free enclosures. Similar practices have been adopted in controlling tsetse flies and ticks of cattle in Tororo district of Uganda (Okello *et al.*, 2021). However, environmentally unfriendly practices such as indiscriminate and improper use of insecticides by the herders can lead to pollution of the environment.

Conclusion: The study respondents have knowledge of the vector and disease. They also know that there are conventional drugs for the treatment of the disease. Most of them treat their animals themselves rather than involving a Veterinary specialist. This may hamper progress in the disease control and eradication. The pastoralists probably withheld vital information on their traditional control practices associated with the disease as a result of mistrust, therefore, there is need to constantly collaborate with the herders so that they will feel free and cooperate with researchers. Also, there is the need to sensitize the pastoralists on the negative effects of indiscriminate and improper use of trypanocides and insecticides.

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