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PREVALENCE OF TRYPANOSOMIASIS IN SHEEP IN THE KACHIA GRAZING RESERVE, KACHIA, KADUNA STATE, NIGERIA

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ABSTRACT

An investigation was carried out in the Kachia grazing reserve in Kaduna, Nigeria, to determine the prevalence of trypanosomiasis among sheep. The reserve has had a history of high prevalence of the disease and farmers in the area are known to ignore the control of trypanosomiasis in sheep and goats and focus more on cattle. The sheep studied showed lacrimation, pale mucous membranes, hair loss, lameness and tick infestation. Blood samples from 110 sheep were collected and examined by using the Standard Trypanosome Detection Method i.e. Haematocrit Centrifugation Technique (HCT), Buffy Coat Method (BCM), and Giemsa stained thick and thin blood films. The packed cell volume (PCV) of each animal was also determined. An overall point prevalence rate of 40.9% (45 positive) was recorded. The average PCV of the infected sheep (19.6 ± 0.45) appeared lower but statistically not significant ($p > 0.05$) than that (18.6 ± 0.51) in those non-infected. The trypanosomes observed were *T. congolense* (40.0%), *T. Brucei* (28.8%), *T. vivax* (17.7%) and mixed infections (13.3%). The potential of small ruminants serving as reservoirs of infection for cattle, insufficiency of professional Veterinary services, absence of alternative trypanosomiasis control methods other than chemotherapy and poor land use practices which forces migration of herds and complicates the control of the disease in the area were discussed.

Keywords: Prevalence, Trypanosomiasis, Sheep, Grazing reserve, Chemotherapy, Reservoir.

PREVALENCE DE LA TRYPANOSOMIASE CHEZ LES MOUTONS DE LA RESERVE DE PATURAGE DE KACHIA, KACHIA, ETAT DE KADUNA, NIGERIA.

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RÉSUMÉ

Une étude a été menée dans la réserve de pâturage de Kachia à Kaduna au Nigeria, pour déterminer la prévalence de la trypanosomiase chez les moutons. La réserve a eu une histoire de prévalence élevée de la maladie dans les moutons et les agriculteurs dans la région sont connus pour ignorer le contrôle de la trypanosomiase dans les moutons et les chèvres et se concentrer davantage sur le bétail. Les moutons étudiés ont présenté des larmolements, des muqueuses pâles, une perte de cheveux, une boiterie et une infestation de tiques. Des échantillons de sang de 110 moutons ont été recueillis et examinés en utilisant la méthode de détection de trypanosomes standard, c'est à dire Technique d'hématocrite par centrifugation (HCT), Méthode Buffy Coat (BCM), et des films de sang Giemsa colorés, épais et minces. L'hématocrite (PVC) de chaque animal a également été déterminé. Un taux de prévalence ponctuelle globale de 40,9% (45 positifs) a été enregistré. Le PCV moyen des moutons infectés ($19,6 \pm 0,45$) est apparu plus faible mais statistiquement non significatif ($p > 0,05$) que celui ($18,6 \pm 0,51$) chez les sujets non infectés. Les trypanosomes observés étaient *T. congolense* (40,0%), *T. brucei* (28,8%), *T. vivax* (17,7%) et les infections mixtes (13,3%). Le potentiel des petits ruminants servant de réservoirs d'infection pour le bétail, l'insuffisance des services vétérinaires professionnels, l'absence de méthodes alternatives de lutte contre la trypanosomiase autres que la chimiothérapie et les mauvaises pratiques d'utilisation des terres qui obligent la migration des troupeaux et compliquent le contrôle de la maladie dans la région ont été discutés.

Mots clés : Prévalence, Trypanosomiase, Moutons, La réserve de pâturage, Chimiothérapie, Réservoirs.

1.0. INTRODUCTION

Trypanosomiasis is an important constraint to the development livestock and agriculture in sub-Saharan Africa with estimated annual losses due to direct and indirect effects of the disease running into billions of dollars (\$5 billion US dollars yearly) or 3 £billion pounds annually (1, 2). It is estimated that without the presence of tsetse in sub-Saharan Africa, 90 million additional cattle could be produced (3). Losses due to the disease include; reduction in herd sizes as a result of livestock deaths and drop in calving rate, reduced market value of animals as a result of loss in condition, drop in milk production, reduced workefficiency of draft animals and prevention of mixed farming (4).

Small ruminants play an important role in the rural economies of sub-saharan Africa. They are kept mainly to generate income, as savings and for ceremonial purposes. They also serve as valuable supplement to cattle in term of animal protein supply for the teaming population including the provision of manure for field crops (5).

In spite of the importance of these animals to the rural poor farming communities (dwellers), research into the incidence trypanosome infection in sheep and goats is limited. Current research is changing notions about the importance of the disease among small ruminants (5,6,7,8). Most worrisome also, is the potential that small ruminants have in serving as reservoirs of infection for cattle (5,1). Trypanosomosis seems to be reemerging as a very important livestock disease in Nigeria, assuming major clinical importance in small ruminants and extending to previously designated tsetse free zones (6). This prompts the need for more detailed work in the area. Previous reports in Northern Nigeria range from 1.6% in sheep and 1.0% in goats (9) to 35.2%, 7.5%, 9.14% respectively (10,11,5) in small ruminants found in Benue, Gombe & Plateau States. A survey carried out by the Nigerian Institute for Trypanosomiasis Research (NITR) in the Kachia grazing reserve (12) revealed an infection rate of 9.49% in sheep and 5.08% in goats.

This study seeks to update information on the prevalence of trypanosomiasis in small ruminants in the area, as adequate information will allow for proper planning of control activities (13,14) as well as serve as valuable scientific data.

2.0. MATERIALS & METHODS

2.1. Study Area
The Kachia grazing reserve (KGR) lies between latitudes 10° 03' and 10° 03' N and longitudes 7° 55'

and 8° 06'E. It is 780m above sea level in the south east of Kaduna state, which is about 90 kilometers from Kaduna town. It is the major part of Ladduga district of Kachia Local Government Area in Kaduna State, Nigeria and has an area of 33,411 hectares with an estimated population of 18,000 people, 50,000 cattle and 30,000 sheep & goats. The area lies within the sub humid zone, which is characterized by a dry season period from November to April, and a rainy season from May to October. The vegetation consists of the typical Northern Guinea savannah Woodland. Rainfall ranges between 1000-1200mm per annum.

The grazing reserve is divided into 6 blocks and each of the blocks consists of several settlements which are communities with separate names. The settlement patterns are mainly hamlets and farm compounds. Most families have goats & sheep. Goats usually graze near homes while sheep usually graze alongside cattle. Each block has a school, an earth dam and at least 2 boreholes. The first and central block (Nassarawa) is where the clinics, drug store, community centre and market are located. The study was carried out during the rainy season (August/September) of 2010.

2.2. Experimental Method

In each block, one village is selected in a day as a converging point: A total of 110 animals were sampled with 26, 37, 22, 15 & 10 in blocks 1, 2, 3, 4, and 5 respectively. In each block, animals that could be sampled along with cattle were randomly selected from each farmer by the Veterinarian. Three millilitre (3 ml) of blood was collected from the jugular vein into sample bottles containing ethylene diamine tetra acetate (E.D.T.A). Parasitological examination was done in the Laboratory using the Standard Trypanosome Detection Method i.e. Haematocrit centrifugation technique HCT(15), Buffy coat method, BCM(16), and Giemsa stained thick & thin films. The packed cell volume (PCV) of each animal was also determined while trypanosome species were identified based on their motility using the BCM and morphological features from Giemsa stained films.

2.3. Statistical analysis

The data obtained from this study was analyzed using the student's t-test. A p-value of <0.05 or less was considered significant.

3.0. RESULTS

A summary of the results can be seen in the table below. A total of 45 (40.9%) animals were found positive with 4, 8, 12, 15 & 6 animals in blocks 1, 2, 3, 4 & 5 respectively. The highest prevalences were in blocks 5 (60%) & 4 (100%) and the most encountered species of trypanosomes was *T. congolense* (40.0%).

PCVs (Packed Cell Volume) as low as 11% but the average PCV among infected animals was 19.6±0.45 and among uninfected 18.6±0.51 but was not statistically significant. Most samples showed very

high parasitaemia. There were also no specific clinical signs attributable to Trypanosomosis observed on the animals.

TABLE 1: SUMMARY OF RESULTS

Blocks	1	2	3	4	5	Total
Number Sampled	2 6	3 7	2 2	1 5	1 0	1 1 0
Number Positive	4	8	1 2	1 5	6	4 5
Point prevalence	15.3%	21.6%	54.5%	100%	60%	40.9%
Species: <i>T. brucei</i>	1	4	2	4	2	13 (28.8%)
<i>T. congolense</i>	2	4	7	3	2	18 (40.0%)
<i>T. vivax</i>	1	-	3	2	2	8 (17.7%)
<i>T. brucei/T. congolense</i>	-	-	-	2	-	2 (4.4%)
<i>T. b / T. c / T. v</i>	-	-	-	4	-	4 (8.8%)

4.0. DISCUSSION

The prevalence rate of 40.9%, is quite high. This is undoubtedly contributing to the poor condition & performance observed in the sheep of the reserve. Infection rates were also higher in blocks farthest from the main entrance into the reserve which also has proximity to occasional professional veterinary services as roads are less motor able in the more interior parts of the reserve (3, 4 and 5) and also farmers tend to treat less in these blocks compared to the more exterior ones (1 & 2) who are less enlightened as it were. *T. congolense* and *T. brucei* were also the most prevalent species identified which differs from previous reports in the reserve (12) and elsewhere (5,11) where *T. vivax* has been implicated as more dominant in sheep & goats. However, it is interesting to note that this result tallies with a concurrent study in cattle where *T. congolense* and *T. brucei* were also highest. This brings to fore the issue of the potential of small ruminants as reservoirs of infection. This study, however, needs to be carried out with more sensitive diagnostic tools for greater clarity.

Of note is also the absence of alternative control methods other than chemotherapy. Most herdsmen administer drugs themselves or employ the use of quacks (17) mostly in order to save costs but also due to an insufficiency of professional Veterinary services. There is no resident Veterinarian in the reserve. These practices lead to poor drug use patterns such as under dosing, use of fake & wrong drugs as well as poor handling and administration of trypanocides. This may be creating a problem of drug resistance in the area (17). Alternative control methods such as the use

of traps, odour baits & insecticide treated cattle usually help to reduce frequent treatment and help prevent or delay the development of drug resistance (18). The Nigerian Government's Grazing Reserve Act of 1964 was promulgated as a response to the problem of alienation of grazing lands. The law was also taken as one of the policy measures to address some of the constraints confronting livestock development in Nigeria. Thus, grazing reserves were established not only to protect grazing lands from crop farming and provide easier access to them by pastoralists but also to encourage the sedenterization of nomadic/transhumant pastoralists through legally secured titles to grazing land & water as well as a means of promoting livestock development (19). Other than the KGR, Kaduna has gazetted and earmarked other grazing reserves in Anchau, Kagarko and Birnin Gwari. However, the KGR is the only functional and organized among them all. And so, though the area was set aside exclusively for grazing of livestock, it has gradually become a settlement for Fulani herdsmen who have unfortunately also taken up crop farming and other commercial activities. This has gradually reduced the pasture available, forcing migration during the dry season, further complicating the control and containment of the disease in the area both in and outside the reserve.

5.0

CONCLUSION

This study has shown that trypanosomiasis is still a problem among small ruminants and may present a greater problem to cattle by acting as reservoirs of infection thereby threatening food security in the area and the region at large. It is necessary that more studies be carried out with more sensitive diagnostic

techniques for greater clarity of the problem. Other control activities also need to be embarked upon in order to reduce drug pressure and thereby prevent or delay the development of drug resistance. Better management practices also need to be carried out by

authorities over the reserve in order to provide professional health services and systems as well as proper land use practices so as to ensure the optimal use of the reserve and contain & control the spread of diseases.

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