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African Animal Trypanosomosis in an Agrarian Settlement in Kaduna City, Kaduna State, Northern Nigeria

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ABSTRACT

Trypanosomiasis has been recognized as a major cause of sickness and death throughout sub-Saharan Africa as well as a major constraint on the use of livestock. Inadequate disease reporting and surveillance has hampered the control of the disease. This study sought to investigate the prevalence of Trypanosomiasis among cattle in Gwaraji district (an agrarian settlement on the fringes of Kaduna metropolis), Igabi Local government area of Kaduna State in Northern Nigeria. A total of 94 cattle were sampled from about 30 herds. These cattle belong to Fulani herdsmen. Parasitological examination was carried out using the Standard Trypanosome Detection Method. The overall infection rate was 25.53% and the trypanosome species observed were *Trypanosoma congolense* (70.83%), *T. brucei* (16.66%) and mixed infections of *T. brucei* and *T. congolense* (12.5%). The implication of the species identified, method of diagnosis and public health concerns were discussed.

Keywords:

Trypanosomiasis, Trypanosomes,
Cattle, Agrarian, Kaduna, Nigeria

INTRODUCTION

It has been reported that since the dawn of the 20th century, Trypanosomiasis (Human and Animal) has been recognized as a major cause of sickness and death throughout sub-Saharan Africa as well as a major constraint on the use of livestock (Allsop 2001). It lies at the heart of Africa's poverty with estimates of gross national per capita income showing that 20 of the world's 25 poorest countries are affected by trypanosomiasis (Bauer et al. 2011). Although there are more prevalent human diseases (particularly diarrhoea, malaria and AIDS) and livestock diseases of similar economic importance, trypanosomiasis arguably represents the greatest debilitating limitation on agricultural production and sustainable human livelihoods on the continent (Allsop 2001, Hursey 2000).

It has been estimated that the control of the disease in Nigeria can potentially triple the current cattle population (Onyiah 1997). It is also estimated that about of 5-10% increase in GDP and almost \$5 billion dollars savings (from annual losses) is projected once the disease is controlled in sub-sahara Africa (Auty et al., 2015; Ilemobade 2009). Also, about 10 million km² of the region (representing about 46% of the total land) is infested with tsetse flies (the vector of the disease) distributed over a belt spanning between latitudes 15°N and 20°S. 46–62 million head of cattle and other livestock species are at risk of contracting the disease (Simukoko et al. 2007).

Inadequate disease reporting and surveillance has hampered the control of the disease. This study sought to investigate the prevalence of Trypanosomiasis among cattle in Gwaraji district (an agrarian settlement on the fringes of Kaduna metropolis), Igabi Local government area of Kaduna State in Northern Nigeria.

MATERIALS AND METHODS

Study area:

The study was conducted in Gwaraji district, Igabi Local government area, Kaduna State, North West Nigeria. The area is a suburban part of Kaduna metropolis where the main occupation of the inhabitants is farming. The cattle herders in their midst are the Fulani who engage in minimal farming activities and some migrate with their cattle in search of pasture.

Kaduna State is located on latitude 10°N, longitude 10°E and altitude 616 m above sea level. The mean annual rainfall is between 880-1380mm. 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.

Sampling was carried out at one point N11°67'27.5" E 3°60'43.1" and elevation of 634m.

Sampling and Diagnosis:

A total of 94 cattle were sampled from about 30 herds. These cattle belong to Fulani herdsman. Animals sampled were selected by simple random sampling.

About 3mls of blood was drawn from the jugular vein using a hypodermic needle and transferred into an Ethylene Diamine Tetra-acetic Acid (EDTA) sample bottle. Parasitological examination was carried out using the Standard Trypanosome Detection Method i.e Haematocrit centrifugation technique HCT (Woo, 1971), Buffy coat method BCM (Murray et al., 1977), 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.

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.

TABLE 1: Table showing Prevalence and species observed

Index	Value	%
Number sampled	94	
Number positive	24	25.53
Number negative	70	
Trypanosome species		
<i>Trypanosoma congolense</i>	17	70.83
<i>Trypanosoma brucei</i>	4	16.66
<i>T. brucei/T.congolense</i>	3	12.50

The overall infection rate was 25.53% and the trypanosome species observed were *Trypanosoma congolense* (70.83%), *T. brucei* (16.66%) and mixed infections of *T. brucei* and *T. congolense* (12.5%). The average packed cell volume (PCV) of infected animals (26.62) appeared higher than the average PCV of non infected (26.40). This was however statistically insignificant (p>0.05).

DISCUSSION

The results are similar to earlier reports in cattle 29.2% (Samdi et al., 2012), 25.23% (Dauda et al., 2017), 37.5% (Haruna et al., 2017) but differ from earlier reports in the region 9% in Lere (Abenga et al. 2004) or other parts of Northern Nigeria 3.8% in Benue (Enwezor et al., 2012) 6.2% in Gombe

(Shamaki et al., 2009) and 19.9% - 67.6% (at different times of the year, Majekodunmi et al., 2013). Animals presented also displayed clinical signs consistent with Animal Trypanosomiasis.

The high occurrence of *T. congolense* among the Trypanosome species concurs with some previous reports (Simukoko et al., 2007, Dauda et al., 2017 and Haruna et al., 2017). But differs with others in the area where *T. vivax* was more prevalent (Abenga et al., 2004, Shamaki et al., 2009, Samdi et al., 2012 and Enwezor et al., 2012). The use of more sensitive diagnostic methods would have helped get more accurate results in terms of specific parasites and prevalence (Simukoko et al., 2007).

Of concern is also the observation of *T. brucei* parasites which are not distinguishable from Human Trypanosomes from this parasitological method which could be a potential public health concern (Karshima et al., 2012). Further and more widespread studies with more sensitive diagnostics are necessary. It can be established from this study that Trypanosomiasis is present in the locality and a potential threat to cattle production.

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