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Prevalence of Trypanosomosis in Cattle at Slaughter in Kaduna Central Abattoir

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ABSTRACT

The aim of this study was to collect information on trypanosomiasis as government and international donors funding for area wide survey has decreased. It is also to determine the prevalence of Trypanosomosis in slaughtered animals at different periods at the beginning (May), peak(August) and after (November) the rainy season. A total of 634 samples were collected and parasitologically examined using standard Trypanosome detection technique (STD) and concentration methods (HCT and BCM) for parasite detection. Physical examination of animals was carried out at slaughter. The overall infection rate was 2.2% while infection rate in males (2.7%) appeared higher than females (1.5%). The trypanosome species observed were *T. congolense* (50%), *T. brucei* (21.4%), *T. vivax* (14.2%) as single infections and *T. congolense/T. brucei* (7.1%,) and *T. congolense/T. vivax* (7.1%) as a mixed infections. The infection rates at the beginning (3.8%) appeared higher than the infection rates after (2.5%) and the peak (0.4%) of the rainy season. The packed cell volume of the infected (23.1±1.9) appeared significantly ($p<0.05$) lower than the packed cell volume of control (36.5±1.1). Also, it was noted that 142 (22%) of sampled animals were grossly emaciated and 57% of the animals found positive were emaciated and weak. This survey does not reflect the true prevalence but rather it provides significant information on the upsurge of trypanosomosis.

Key words: Periods, trypanosome, abattoir, cattle, sex, clinical signs

INTRODUCTION

The current threat of African animal trypanosomosis ranked among the top 10 cattle diseases on sustainable livestock production and mixed farming, coupled with failure of vector control as well as chemotherapy/chemoprophylaxis to control the present resurgence of the disease, presents a major constraint in the development of the African continent (Perry *et al*., 2002; Abenga *et al*., 2002; Samdi *et al*., 2010a). These constitude a major threat to attaining food security in several parts of subsaharan Africa and Nigeria (Samdi *et al*., 2010b). It is currently estimated that about 60 million people and 48 million cattle (Kristjanson *et al*., 1999; Samdi *et al*., 2010a) are at risk of contracting African trypanosomosis from the 23 species and 33 subspecies of tsetse flies infesting 10 million km^2 of Africa stretching across 40 countries. The trypanosoma species of ecomic

importance in cattle are *Trypanosoma congolense, T. vivax* and *T. brucei*. Tsetse transmitted African trypanosomosis 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 loss in livestock production and mixed agriculture alone is valued at 5 billion US dollars yearly in Africa however effective and sustainable control measures can result in up to 3 fold increase in the current estimated livestock population in Nigeria (Onyiah, 1997). The decrease in national and international funding for research and surveillence of trypanosomiasis has resulted in insufficient information on the current status of the disease (Maikaje *et al*., 2009). This study seeks to determine the prevalence of trypanosomosis in trade cattle at slaughter in Kaduna abattoir using clinical signs and parasitological techniques.

MATERIALS AND METHODS

The study was conducted at the Kaduna abattoir within the months of May, August and November 2009 targeting the periods before, during (peak) and after the rainy season. A total of 634 cattle were sampled. Five millilitre of blood was collected from the jugular vein at slaughter into bijou bottles containing one milligram powder of Ethylene Diamine Tetra Acetate (EDTA) per millilitre of blood. The blood samples were kept cool in a flask containing ice packs. Parasitological examination was done in the laboratory using the Hematocrit Centrifugation Technique (HCT) where cappillary tubes are fill up to 2/3rd with blood and centrifuged to concentrate the parasites (Woo, 1971), Buffy Coat Method (BCM) here the parasites are located and identify within the buffy coat region and Giemsa stained thin films where smares are made, stainned with Giemsa and view under an oil immersion field. The Packed Cell Volume (PCV) of each animal was also determined using a hematocrit reader. Trypanosome species were identified based on their motility and morphological structures from Gemsa stained films. Physical examination of animals at slaughter was carried out.

RESULTS AND DISCUSSION

The prevalence of trypanosoma infection and the specie of trypanosome seen in male and female cattle at slaughter at the Kaduna central abattoir was shown in the Table 1. Out of the 634 cattle sampled 14 (2.2%) were infected with trypanosomes. The infection rate in bulls (2.7%) appeared higher than the infection rate in cows (1.5%) but is not statistically significant ($p<0.05$). While the infection rates at the beginning (3.8%) appeared higher than infection rates at the peak (0.4%) and after (2.5%) the rainy season. The packed cell volume of the infected (23.1±1.9) appeared significantly ($p< 0.05$) lower than the packed cell volume of control (36.5±1.1). Also, 142 (22%) of sampled animals were grossly emaciated. Trypanosme infection rate was higher in

Table 1: Trypanosome infection rates in cattle at slaughter in Kaduna, North Central, Nigeria

Sex	Rainy season	No. examined	No. positive	Infection (%)	*T. vivax*	*T. congolense*	*T. brucei*	Mixed	Overall infection rate (%)
Bull	Beginning	118	4	3.38	1	2	-	1	
	peak	130	1	0.76	-	1	-	-	2.70
	After	122	5	4.09	-	2	3	-	
Cow	Beginning	91	4	4.39	1	2	-	2	
	Peak	97	0	0.00	-	-	-	-	1.51
	After	76	0	0.00	-	-	-	-	
Total		634	14	2.21	2	7	3	3	2.21

emaciated 10 (7.0%) than in non emaciated cattle 4 (3.0%). The trypanosome species observed were *T. congolense* (50%), *T. brucei* (21.4%), *T. vivax* (14.3%) as single infections and *T. congolense/ T. brucei* (7.1%) *and T. brucei/T. vivax* (7.1%) as mixed infections. The overall infection rate of 2.2% in cattle at slaughter in Kaduna was significantly different from the national trypanosomiasis prevalence rate in cattle obtained by the EEC-Trypanosomiasis control project between 1989 and 1991 (Onyiah, 1997). Although, Abenga *et al.* (2002) reported similar infection rates in cattle at slaughter in Kaduna, North central Nigeria, these rates indicate a general resurgence in the menace of trypanosomosis in Nigeria with negative economic impact on meat quality of animals at slaughter.

Surveys conducted between 1989 and 1991 in Northern Nigeria, where two thirds of Nigeria's livestock resources are concentrated showed a prevalence rate of 4.3% in cattle. A higher prevalence rate of 10.0% was obtained in a wider survey of all agro ecological zones between 1993 and 1996 (EEC Mid-Term Report, 1992; NITR/NARP External Review, 1996; Onyiah, 1997). More recent studies in the region have revealed prevalences ranging from 5.5 to 17.8% to over 50% (Qadeer *et al.*, 2009).

The result of this study signifies that trypanosomosis is still an important constraint in livestock production and productivity. The prevalence of trypanosome infection (2.2%) and emaciation rate (22%) reported in cattle at slaughter appears reasonably high giving the economic importance of cattle in generating income and contribution to food security. The higher infection rate during rainy season may be attributed to increase in both tsetse and other biting flies population during this peroid of the year making such vectors to also encroach on settlement areas. However, the low infection rate or absence of infection may be attributed to decrease in both tsetse and other biting flies population as a result of environmental, weather and anthropological changes. The study support the findings of Samdi *et al.* (2008) that *T. congolense* was the predominant trypanosome specie and the higher infection rates arising from *T. congolense* confirms the economic importance of the species infection in livestock in Nigeria giving the complementary roles played by other haematophaguos flies despite epidemiological studies support only the mechanical transmission of *T. vivax* but not *T. congolense* but experimental studies confirm that both species can be mechanically transmitted (Onyiah, 1997; Desquesnes and Dia, 2003, 2004).

Mechanical transmission of trypanosome by other vectors other than *Glossina* has been identified as a factor responsible for spread of the parasite to many parts of the world and maintenance of transmission in the presence of tsetse control (Davila and Silva, 2001; Samdi *et al.*, 2010a).

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