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BOVINE TRYPANOSOMIASIS (NAGANA) IN PORT HARCOURT ABATTOIRS, RIVERS STATE, NIGERIA

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ABSTRACT

This study was conducted between June and October 2014 to determine the current prevalence of bovine trypanosomiasis in four abattoirs in Port Harcourt metropolis, Rivers State, Nigeria. Parasitological survey (buffy coat technique, thin film) and hematological study (packed cell volume (PCV) were employed. Of the 200 blood samples examined, 62 cattle were infected giving an overall prevalence of 31%. Three different *Trypanosoma* species were encountered in the study area, 27 (13.5%) *Trypanosome brucei, 18* (9%) *T. congolense* and 7 (3.5%) *Trypanosome vivax*, while 10 (5%) had mixed infections. White Fulani 45(35.16%) had the highest prevalence of occurrence while Rumuokoro abattoir recorded the highest prevalence of *T. brucei* (18%) infection. The common breeds identified were the White Fulani and Sokoto Gudali. The White Fulani had higher infection status 45 (35.16%) than the Gudali 17 (23.60%). Among the risk factors, sex and age were found to have no significant association with the prevalence of trypanosomosis ($p>0.05$) in the study area. In this study infected White Fulani animals were with mean PCV value of 23.29 ± 3.97% while Sokoto Gudali infected animals had (22.82 ± 3.89%). This study concluded that trypanosomiasis is still of considerable importance in cattle in the study area. However, importance of the infection is enough reason for thorough examination of the ruminant carcasses presented for public consumption to reduce the risk of human infection.

KEYWORDS: Prevalence, bovine trypanosomiasis, abattoir, White Fulani.

INTRODUCTION

Trypanosomiasis is regarded economically as the most important disease of cattle on the African continent. It is a disease caused by blood and tissue dwelling protozoan parasites of the genus *Trypanosoma* and transmitted by the tsetse fly *Glossina* (Fasanmi *et al.*, 2014). However, because of the widespread distribution of the insect vector and the limitations of current control measures, it is prevalent throughout vast areas of Africa. Characterized by intermittent fever, parasitaemia, anaemia, lymphadenopathy, jaundice, progressive emaciation, weakness, and reduced productivity (Sam-Wobo *et al.*, 2010). There is also widespread tissue damage affecting organs such as the heart, skeletal muscles, endocrine system and reproductive tract. Trypanosomiasis is one of the most important diseases restricting livestock development in Africa today, limiting crop agricultural, animal production and forestry developments (Panin and Mahabile, 1997). Trypanosomiasis, therefore represents a major obstacle not only to increasing food production but also to the agricultural and socio-economic development of communities within infested areas, thereby directly contributing to hunger, poverty, protein malnutrition and suffering of entire communities in Africa (PATTEC, 2002). In Port Harcourt, information on bovine trypanosomiasis remained scanty and considering the emphasis on food security and agriculture, it became imperative to evaluate and assess the prevalence of trypanosomiasis in the major abattoirs of Port Harcourt, Rivers State where many cattle brought from the Northern part of the country are slaughtered and consumed.

MATERIALS AND METHODS

The study was conducted in four abattoirs in Port Harcourt (Trans-Amadi, Rumuokoro, Alakahia and Choba), Rivers State, Nigeria within June 2015 and October. The history of animals were taken to ascertain their source and passage through tsetse fly belts and general husbandry practice. Most of the animals were brought from Northern parts of Nigeria namely; Sokoto, Kano, Katsina, Jigawa, Adamawa, Borno, Zamfara and Niger States. Physical examination of 200 cattle were randomly carried out and 5ml of blood collected from the jugular vein at the various slaughters into a bottle

containing EDTA. The animals were examined physically by the aid of Health Officials for manifestation of clinical symptoms. The blood samples were kept cool in a flask containing ice packs.

Parasitological examination

Buffy Coat Technique was done in the laboratory using the Hematocrit Centrifugation Technique (HCT) where capillary tubes were filled up to 2/3rd with blood and centrifuged to concentrate the parasites (Cheesbrough, 2005). Giemsa stained thin films were prepared after it was air dried and fixed in methanol for 3 minutes, oil immersion was applied and two hundred fields were examined under light microscope. The Packed Cell Volume (PCV) of each animal was also determined using a hematocrit reader. After the PCV were read, capillary tubes were broken in 1 mm below the Buffy coat. Trypanosome species were identified based on their motility and morphological structures.

RESULT AND DISCUSSION

Of the two hundred blood samples (200) collected from the four abattoirs, 62 (31%) were infected by various *Trypanosoma* species. There were variations in infection rates across the abattoirs with Alakahia and Choba having the highest prevalence of 44% and 36% respectively, while Trans-Amadi abattoir had the least prevalence of 14%. There was statistically significant difference in prevalence of trypanosomiasis between the abattoirs (χ^2=11.314, df=3, p=0.010) (Table 1). Sex-related prevalence showed that although males (35%) had a higher prevalence than females (27%), it was not statistically significant (χ^2= 1.496, df=1, p= 0.221). Result from the study showed that white Fulani (35.16%) had the highest prevalence of infection while Sokoto gundali had the least (23.60%) and there was no significant difference in prevalence between the two breeds (χ^2=2.871, df=1, p=0.090) as shown in Table 2. In addition, the type of trypanosomes species observed across the abattoirs, Table 3 revealed that of the 62 (31%) positive cattle examined, 7 (3.5%) were positive for *T. vivax*, 18 (9%) were positive for *T. congolense*, 27 (13.5%) were positive for *T. b. brucei* while 10 (5%) were cases of mixed infection. Rumuokoro had the highest prevalence in *T. brucei* (18%). The mean packed cell volume of infected white Fulani was 23.29$\pm$ 3.97 while those of the uninfected was 38.07 $\pm$ 2.55. The PCV of the Sokoto Gundali showed that the infected ones had a mean PCV of 22.82$\pm$3.89 while the uninfected ones had 39.41$\pm$6.30.

The overall prevalence of 31% is very much lower when compared with an overall prevalence of 53.33% reported by Hassan *et al.*, (2016) and Maikaje (1998). The study agrees with Sam-Wobo *et al.*, 2010 who reported a prevalence of 31.6%, this is surprising considering the fact that the vector Glossina are not endemic in Rivers State unlike Ogun State (Trial *et al.*, 1985). And so, possibly, the cattle were not treated of trypanosomiasis before they were allowed into the state. The vector moves along with the herd from the northern to the southern parts of Nigeria during migration. The result of this work disagrees with Zubairu *et al.*, 2013, who had a prevalence of 13.33%. This could be as a result of physiological difference (Torr *et al.*, 2000), difference in location and management system (Ardo *et al.*, 2000). Moreover, the high prevalence of animal trypanosomosis in Rivers State appears to indicate an increase in the menace of the disease in the State. However, variation in the study areas could be as a result of closeness in proximity, and may have the same supply of cattle from the north, which could have played a role in their close prevalence rates. Though sex prevalence rates showed a higher prevalence in males than females, there was no statistically significant difference. Quadeer *et al.*,(2008) and Sam-Wobo *et al.*, 2010 in separate studies also observed no significant difference in prevalence rates in cattle based on sex. Breed specific rate in this study showed that the White Fulani had higher infection rate than Sokoto Gudali. This observation had been noted earlier by Quadeer *et al.*, (2008) where they compared the White Fulani and the Red bororo and they observed that the White Fulani had higher prevalence with the least recorded for Red bororo. The mean PCV of infected cattle was lower than the PCVs values of non-infected cattle. This however, agrees with results of Daniel *et al.*, (1994) that severe anaemia is mostly associated with *T. vivax* (Plate 2) infections as compared to other species of trypanosomes. Such significant difference of PCV values in infected cattle had been reported in Nigeria and elsewhere (Omotainse *et al.*, 2000; Fasanmi *et al.*, 2014, Zelalem *et al.*, 2015), where they demonstrated that haematocrit values of infected cattle decreased during the infection period indicating among others the notable pathogenic effects of mechanically and biologically transmitted trypanosomiasis.

It can be inferred from this study that trypanosomiasis is still of considerable importance in cattle in the study area. Public and veterinary importance of the infection is enough reasons for thorough examination of the ruminant carcasses presented for public consumption to reduce the risk of human infection; it therefore appears appropriate that chemotherapeutic and chemoprophylactic as well as tsetse fly control programs should be extended to the area in order to curtail the menacing effects of the disease and arrest the flight from the area of the semi-nomadic Fulanis during the rains. These findings call for concerted and sustained efforts in the control of the disease in Port Harcourt. In addition, farmers should routinely treat their animals with the appropriate trypanocidal and, awareness should be created on the prevention and control methods of trypanosomiasis.

Table 1: Prevalence of trypanosomiasis based on location.

Location	No. Examined	No Positive	χ^2	P-value
Trans-Amadi Rumuokoro Choba Alakahia Total	50 50 50 50 200	7(14) 15(30) 18(36) 22(44) 62(31)	11.314	0.010
Sex				
males	100	35(35)		
females	100	27(27)	1.496	0.221

Table 2: Distribution of Infection by Cattle Breed.

Breed	No. Examined	No. infected (%)	χ^2	p-value
White Fulani Sokoto Gundali	128 72	45(35.16) 17(23.60)		
Total	200	62(31)	2.871	0.090

Table 3: Type of Trypanosome Species Observed across the Abattoirs.

Location	No. Examined	*T. vivax* (%)	*T. brucei* (%)	*T. congolense* (%)	Mixed (%)
Trans-Amadi	50	0 (0)	4 (8)	2 (4)	1 (2)
Rumuokoro	50	1 (2)	9 (18)	4 (8)	1 (2)
Choba	50	2 (4)	6 (12)	5 (10)	5 (10)
Alakahia	50	4 (8)	8 (16)	7 (14)	3 (6)
Total	200	7 (3.5)	27 (13.5)	18 (9)	10 (5)

Table 4: Mean Packed Cell Volume of Different Breeds of Cattle Slaughtered at Port Harcourt Abattoir.

Breed	Prevalence (%)	Trypanosome Uninfected PCV (%) Mean ± S.D	Trypanosome Infected PCV (%) mean ± S.D
White Fulani Sokoto Gundali	45 (35.16) 17 (23.60)	38.06±6.24 39.41±6.30	23.29± 3.97 22.82±3.89

Plate 1: *T.* brucei under the microscope.

Plate 2: *T. vivax* under the microscope.

REFERENCES

1. Ardo, M.B., Yakubu B., and Aliyara Y.I. Prevalence and significant of bovine trypanosomes infection in Yola South Local Government Area, Nigeria. *Nigeria Journal of Tropical Agriculture*, 2000; 2: 53-59.
2. Daniel, A. B., Dadah, A. Y., Kalejaiye, J. O. and Dalhatu, A. D. Prevalence of bovine trypanosomiasis in Gongola State of Northern Nigeria. *Revue Elev. Medicine Pays Trop*, 1994; 46(4): 5.
3. Fasanmi, O. G., Okoroafor, U. P., OC Nwufoh, O. C., OM Bukola-Oladele, O. M and Ajibola, E. S. Survey for trypanosoma species in cattle from three farms in Iddo Local Government Area, Oyo State. *Sokoto Journal of Veterinary Sciences*, 2014; 12(1).

4. Hassan D.I, Musa, S.I, Yusuf N. D and Adua, M. M. Prevalence of Bovine trypanosomiasis in Lafia Abattoir, Lafia , Nasarawa State. *PAT* June, 2016; 12(1): 204-210. ISSN: 0794-5213
5. Maikaje D.B. Some aspects of the epidemiology and drug sensitivity of bovine trypanosomiasis in Kaura LGA of Kaduna State. PhD Thesis, Ahmadu Bello University, Zaria, Nigeria, 1998; 147.
6. Omotainse, S. O., Edeghere, G. A., Omoogun, E. O., Elhassan, G., Thompson, C. A., Igweh, J. A. C., Ukah, I. M. A. and Halid, I. The prevalence of Animal Trypanosomosis in Nigeria. *Israel Journal of Veterinary Medicine*, 2000; 55(4): 1-4.
7. Panin, A and Mahabile, M. Profitability and household income contribution of small ruminants to small scale farmers in Botswana. *Small Ruminant Resources*, 1997; 25(1): 9−15.
8. PATTEC. Proceedings for Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC), 2002.
9. Quadeer, M. A., Danbirni, S., Usman, M., Akogun, O. B., Gundiri, M. A. and Bobbo, A. G. Prevalence of bovine trypanosomiasis in Bassa Local Government Area, Plateau State, Nigeria. *Nigeria Journal of Parasitology*, 2008; 29(2):136-139.
10. Sam−Wobo, S. O., Igenezoa, A. J., Idowu, O. A., Otesile, E. B., Ekpo, U. F and Kehinde, O. O. Bovine trypanosomiasis and its impact on cattle in derived Savannah areas of Ogun state, Nigeria. *Journal of Public health and Epidemiology*, 2010; 2(3): 43−47.
11. Trial, J.C.M., Sones K., Kibb J.C.M., Dorkin J., Light D.E., and Murray M. Productivity of Boran cattle maintained by Chemoprophylaxis under trypanosomiasis risk ILCA *Research Record*, 1985; 9: 1-8.
12. Torr, S.J., Wilson, P.J., Schofeld, S. Mangwiro I.N.C., Akber, S. and White, B.N. Improving control of tsetse: the use of DNA profiling to establish the feeding responses of tsetse to cattle. Final technical Report (Project R 7364). DFID Animal Health Programme, 2001.
13. Zelalem, A., Diriba, L., Birhanu, Ab and Eyob, E. Prevalence of small ruminant trypanosomosis in Assosa and Homosha districts, Benishangul Gumuz Regional State, North-West of Ethiopia. *Journal of Veterinary Medicine and Animal Health*, 2015; 7(5): 186-192.
14. Zubairu A.I., Midau A., Dazala I.U., Yahya M.M., Buba Z.M. The prevalence of bovine trypanosomiasis in Song Local Government Area of Adamawa State, Nigeria. *Global Veterinaria*, 2013; 11(3): 310-313.