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Incidences of Haemoparasites in Dogs in Ikwuano Local Government Area of Abia State

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Abstract

Out of 503 dogs samples analyzed 104 were males and 303 females and out of these 359 (71.4%) were positive for haemoparasites. *Babesia spps* (94.4%) had the highest prevalence compared to Trypanosomes 5.0% and *Anaplasma spps* 45.0%. Most of the dogs had mixed infections of *Babesia* and *Anaplasma spps*. The prevalence was higher in females 76.3% compared to males 54.0%. Out of the areas sampled, MOUAU community had 20.0%, Oboro 91.4%, Oloko 8.0%, Ibere 18.0%, Ariam 59.0% and Usaka 58.3%. The highest prevalence was recorded in December (90.0%), March (83.3%) and November (83.3%) whilst the remainder of the months had April (77.1%); May (70.0%); June (68.0%); July (63.3%) and August (53.1%). There were significant decreases in the PCV and Hb of the infected groups.

Keywords: Incidence; Haemoparasites; Dogs; Ikwuano; *Babesia spp;* trypanosome*; Anaplasma spps*; Abia State

Introduction

Several haemoparasites of dogs causes diseases of public health importance. *Trypanosoma cruzi* ranked the 4th greatest endemic disease in America, affecting not less than 16 to 18 million people and about a 100 million people at risk of the disease [1,2]. Apart from Trypanosomosis, dogs are constantly challenged by other haemoparasites such as Babesiosis and Anaplasmosis which causes anaemia. Babesiosis is one of the most important haemoparasites of animals [3], including dogs. The disease is found throughout Africa, Asia, Europe, the Middle East, North America and America where it affects dogs [4]. Recently, reports on the incidences of haemoparasites in dogs have been made in several continents of the world. Kamani et al. [5] recorded 42% prevalence at Vom, Nigeria, comprising mostly of *Babesia canis* 27%. Similarly, Barker et al. [6] recorded a prevalence of 44% in stray dogs in Australia comprising amongst others 20(51%) *Anaplasma platys* and 17(44%) *Babesia vogeli*. Therefore, paucity of information on incidences of haemoparasites of dogs in Ikwuano L.G.A. of Abia State prompted this research.

Materials and Methods

Ikwuano L. G. A. of Abia state is comprised of 5 clans with a total of 43 communities. Out of these, Oboro has 18, Ibere 7, Oloko 8, Ariam 6 and Usaka 3. A total of 14 communities were randomly sampled in the study, and they include 6 communities in Oboro, 2 in Ibere, 3 in Oloko, 2 in Ariam and 1 in Usaka. In the selected communities dogs were randomly sampled. One mililiter of blood sample was collected through the cephalic veins of dogs into a well labeled EDTA bottle according to Jamie [7] and kept in an iced packed cooler before transportation to the laboratory for analysis. The study commenced in March and ended in December 2012. The analysis was done using thin blood technique stained with Geimsa for both *Babesia spps* and *Anaplasma spps*. *Trypanosomes* were detected using both wet mount and Buffy coat techniques for accuracy. The Packed cell volume and haemoglobin concentrations of the animals were determined according to the method of Woo [8]. The number of samples collected was determined using the expression as described by Mahajan and In Garba [9].

$N=Z^2PQ/d2.$

N=no of samples to collect, Z=A constant degree of freedom, P=Percentage of published prevalence, Q=(1-P), D=Confidence interval designated as 0.05.

Statistical analysis

The results obtained were analyzed using descriptive statistics [10] and presented as tables. The prevalence (P) of the diseases were calculated using the formula P=d/n. where N=positive cases/ Total number of samples examined [11]. The prevalence of the diseases was expressed in percentage. The PCV and HBC were analyzed using ANOVA and the means separated with Duncan's multiple range tests.

Result

In Table 1, out of the 503 samples analyzed, a total of 359 (71.4%) samples were positive for haemoparasites. *Babesia* species had the highest prevalence of 339 (94.4%); *Anaplasma* species 160(45.0%) and the least in trypanosomes 18 (5.0%). Amongst the different locations sampled, Oboro had the highest prevalence 320 (91.4%), followed by Ariam 17 (59.0%); Usaka 7 (58.3%); MOUAU community. 2 (20.0%) and Ibere 9 (18.0%) while Oloko had the least prevalence 4(8.0%). In Table 2, the highest prevalence was recorded in December (90.0%); this was followed by the month of March (83.3%) and November (83.3.0%).

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Location	Total no examined	Total No of *Trypanosoma spps*	Total No of *Babesia spps*	Total No of *Anaplasma spps*	Total prevalence of haemoparasites
MOUAU COM	10	0	2	0	2 (20.0%)
OBORO CLAN	350	18	302*	150*	320 (91.4%)
IBERE CLAN	51	0	9*	4*	9 (18.0%)
OLOKO CLAN	51	0	4*	4*	4 (8.0%)
ARIAM CLAN	29	0	16	1	17 (59.0%)
USAKA CLAN	12	0	6	1	7 (58.3%)
Total	503	18 (5.0%)	339 (94.4%)	160 (45.0%)	359 (71.4%)

Table 1: Prevalence of haemoparasites in dogs in Ikwuano L.G.A. of Abia state, Nigeria 2012.

Months	**Number examined**	**Prevalence (%) of positive cases**	**Number of Males**	**Prevalence (%) of positive cases**	**Number of Females**	**Prevalence (%) of positive cases**
March	60	50 (83.3%)	2	1 (50.0%)	58	49 (84.5%)
April	35	27 (77.1%)	5	3 (60.0%)	30	24(80.0%)
May	40	28 (70.0%)	18	12 (67.0%)	22	16(73.0%)
June	25	17 (68.0%)	5	0 (0.0%)	20	17(85.0%)
July	90	57 (63.3%)	6	0 (0.0%)	84	57(68.0%)
August	113	60 (53.1%)	45	20 (44.4%)	68	40(59.0%)
Sept-Oct	Nil	Nil	Nil	Nil	Nil	Nil
November	90	75 (83.3%)	20	18 (90.0%)	70	57 (81.4%)
December	50	45 (90.0%)	3	2(67.0%)	47	43(91.5%)
Total	503	359(71.4%)	104	56(54.0%)	397	303(76.3%)

Table 2: Month and sex prevalence of Haemoparasites in dogs in Ikwuano L.G.A. of Abia state.

Species of Animal/ parasite type	Pack cell volume (%)		Haemoglobin conc (g/dl)	
Dog	Non-Infected	infected	Non-Infected	infected
Trypanosomes spps	36.30 ± 4.5^{a}	28.36 ± 4.6^{b}	13.30 ± 3.2^{a}	10.30 ± 3.2^{b}
Babesia spps	36.30 ± 4.5^{a}	30.20 ± 2.3^{b}	13.30 ± 3.2^{a}	12.09 ± 4.7^{b}
Mix infection	36.30 ± 4.5^{a}	24.38 ± 3.6^{b}	13.30 ± 3.2^{a}	6.39 ± 2.3^{b}

Different superscripts (a, b, c) in a row indicate significant difference between the group means (P<0.05).

Table 3: Influence of Trypanosomes, Babesiosis, Anaplasmosis and mix infection on Pack Cell Volume and Haemoglobin concentration of dogs in Ikwuano L.G.A of Abia state.

June (68.0%); July (63.3%) while August recorded the least (53.1%) prevalence. Out of a total of 503 dogs sampled, 104 were males and 303 females. The prevalence of haemoparasites was higher in females 303 (76.3%) when compared to the males 56(54.0%). In Table 3, there was a significant decrease in the PCV and haemoglobin concentration of animals infected with haemoparasites. Those with mixed infections of *Babesia* and *Anaplasma* species had a lower 24.38 ± 3.6^{b} PCV and 6.39 ± 2.3^{b} HB compared with trypanosomes 28.36 ± 4.6^{b} and *Babesia* 30.20 ± 2.3^{b} species

Discussion

Apparently there was a substantial prevalence 359(71.4%) of *Trypanosomes, Babesia* and *Anaplasma* species in dogs in Ikwuano L.G.A. of Abia state as observed from the result of the study (Table 1). This was higher than 23.33% observed by Obeta et al. [12] in Abuja. This emphasizes the need for proper health management and Veterinary care of dogs within this area. Trypanosomes are particularly of interest considering the acute nature of the disease compared to babesiosis and anaplasmosis in dogs. The low prevalence recorded in this study could signify incidental transportation of infected dogs from endemic areas. Similarly, it could mean low prevalence of the vector tse-tse within the area. Nevertheless both *Babesia* and *Anaplasm* spps are still very important haemoparasites of dogs commonly transmitted through bites from infected ticks and dogs often are exposed to ticks by their natural social behavior. Free roaming dogs are more predisposed to ticks infestation than in-house pets; as such dogs easily pick up infection by contact with infected dogs. Although the benefit of in-house pets could be played-out, in the absence of hygienic practices in kernel. Hence government should provide veterinary clinics in communities along side human health centers for comprehensive human and animal health management in the light of one health one world initiative program. Some of the dogs had mixed infections of *Babesia* and *Anaplasma* species as observed by Lako et al. [3] in his study on ruminants.

The high prevalence of haemoparasites (Table 2) recorded in March and November agrees with the findings of Obeta et al. [12] who detected highest prevalence of haemaparasites in December. This could be attributed to the dry weather conditions allowing free roaming and spread of diseases in animals. However, this was in contrast with the findings of Samdi et al. [13], who observed high prevalence of haemoparasites during rainy season. The relatively low prevalence of haemoparasites in the months of June, July and August could be attributed to the rainy weather conditions apparently not suitable for spread of vector transmitted disease. In dry season, there is free roam of animals which allows easy spread of disease through contact infection. This situation however is abridged through confinement of animals during rainy season thus reduces prevalence of various disease conditions. The seeming high prevalence of haemoparasites in females than in the males could be related to the proportion of the populations sampled. This corroborates the findings of Samdi et al. [13]. Most households keep females than males especially for breeding purposes. The significant decreases in the PCV and HBC of infected animals'(Table 3) highlights the deleterious effects of haemoparasites on the blood responsible for anaemia associated with the diseases. The

import of haemoparasites in dogs demands proper surveillances to enforce early control measures.

In conclusion, some species of *Trypanosomes* in dogs are also zoonotic, therefore the need for continuous surveillances on the prevalence of haemoparasites in our communities as a control strategy. The result of such studies would aid Veterinary diagnosis and prognosis of diseases in dogs within the area. Furthermore, awareness programs should be mapped out in communities to encourage dog owners to seek veterinary services in the management of their dogs for effective disease control.

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