

Community-based Investigation of Rabies Antibody Profile of Dogs and Control in Ilorin, Kwara State, Nigeria

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ABSTRACT

This survey is a community-based investigation of rabies antibody profile in Ilorin, Kwara State, Nigeria. The aim is to examine how the dogs owners control this disease in the study area. This study employed survey research design. One hundred and ninety apparently healthy dogs of both sexes (106 males and 84 females) were selected for the study using stratified random sample technique. The study provides the rabies antibody profile of dogs in Ilorin, Nigeria using an ELISA technique. In addition, a structured questionnaire was administered to the dogs owners in the study area within three months to assess anti-rabies vaccination history and rabies history in the community. The study reveals a seroprevalence rate of 53.70%, 43.60% and 25% for Ilorin East, Ilorin West and Ilorin South respectively. The low prevalence of antibody against rabies observed in this study indicates lack of consistent vaccination programme and/or vaccination failure in some cases. Data analysis was done through student t-test. Based on the findings of this study, the control of rabies in dogs through vaccination remains the only cost effective way to control rabies in dogs and to sustainably protect human from contacting the disease.

Keywords: Rabies, control, sustainable prevention, animal source

INTRODUCTION

Rabies is one of the oldest communicable disease, widespread, neglected and under-reported zoonosis that is very fatal once symptoms occur in man and animal. The most effective and economical solution to protect the dogs and human is to combat all zoonotic pathogens through their control at animal source. The dog is responsible for almost 98% of fatal rabies cases in human (Wilsmore, Hamblin, Taylor, Taylor and Watson, 2006). It is a disease that poses global public health challenge in terms of its damage control. Several factors such as human, animal and environment affect the control of the disease. Rabies is the oldest communicable disease of humans and has been associated with animal bites for more than 3000 years (Wilkinson, 1998). It is an acute viral encephalomyelitis that affects all warm blooded wild and

domestic animals and humans (Center for Disease Control and Prevention, 2010). Most feared of all viral infections (WHO, 2008), rabies is wide-spread and under-reported. It is a neglected zoonotic disease because the public health significance of rabies is not well recognized and its control is not well addressed by national and international authorities (Knobel et al, 2009). Rabies is classified as the eleventh killer disease of the world, killing 60-100,000 human beings annually (WHO, 2008). More than 99% of these deaths occur in the developing world mainly because rabies is endemic in domestic dog population which is the principal reservoir of rabies (Cleaveland, Hampson and Kaare, 2007). Dog is responsible for approximately 98% of fatal rabies cases in human (Wilsmore et al, 2006).

Rabies is preventable through vaccination, public awareness, responsible ownership, sustained collaboration among stakeholders and elimination of stray dog population (Knobel et al, 2009). Rabies control is affected by human, animal and environmental factors (Aiyedun and Olugasa, 2012b). Although numerous studies have been conducted on rabies in Nigeria, comprehensive information on rabies control is limited in the literature. This limits effective information on public health and rabies control in Nigeria. This study is therefore a community-based investigation of rabies antibody profile and control of dogs in Ilorin, Nigeria.

MATERIALS AND METHOD

Ilorin lies between latitude 8°25N to 8°32N and longitude 4°30E to 4°41E, with a population of 0.85 million (FGN Official Gazette, 2007). Ilorin has a small industrial activity base, and the inhabitants are predominantly civil servants and small/medium business operators. The city is situated approximately 400km from Abuja (Federal Capital Territory). Ilorin is easily accessible to all parts of the country by air, road and rail transport. This study adopts survey research design. Using stratified random sample technique, 190 apparently healthy dogs of both sexes (106 males and 84 females) were selected for this study across districts, streets and households in Ilorin between January and March 2012.

With the aid of sterile needles and syringes, 3ml of blood was collected from each dog, through the cephalic vein into plain sample bottle without anticoagulant and allowed to clot. Sera were obtained by centrifuging at 3,000rpm and these were stored at -4°C until tests were conducted. The study provides the rabies antibody profile of dogs in Ilorin, Nigeria using an ELISA technique. Our expertise in the field of veterinary medicine was brought to bare in the aspect of managing the aggressive nature of the subject of this study. A structured questionnaire was designed and administered to dogs owners within the three months so as to assess anti-rabies vaccination history and rabies history in the community. Those interviewed were asked to produce vaccination certificates as proof of vaccination. Data analysis was done through student t-test.

RESULTS AND DISCUSSION

Table 1a shows that 49.1% of exotic breeds of dog, while table 1b shows that 32.4% of local breeds of dog had rabies antibody titre that are equal or greater than 0.5eu/ml in their serum (WHO stipulated standard threshold for neutralizing antibodies against rabies capable of conferring immunity in dog as 0.5eu/ml). The study provides the rabies antibody profile of dogs in Ilorin, Nigeria using an ELISA technique and reveals a seroprevalence rate of 53.70%, 43.60% and 25% for Ilorin East, Ilorin West and Ilorin South respectively (Figure 2). The low prevalence of antibody against rabies observed in this study may indicate lack of consistent vaccination programme and/or vaccination failure in some cases.

Meanwhile, these findings did not attain the World Health Organization prescribed 70-80% epizootiological baseline of herd immunity in the community. The low seroprevalence favours local or large scale outbreaks of rabies with an increased risk for humans (Aiyedun, 2011, Aiyedun and Olugasa 2012a). The low seroprevalence in local breeds of dog indicates less care and attention given to them compared with the exotic breed of dogs that are highly priced (Aiyedun and Olugasa, 2012b). This result corroborates Aiyedun (2011); Aiyedun and Olugasa (2012a, 2012b) in the fact that more effort is needed to control rabies in Nigeria.

There is need for animal health authorities to utilize sero-surveillance for pre- exposure anti-rabies vaccination of dogs in Nigerian communities, if the country is to achieve rabies control as reported by Thailand and some other Asian countries (Wasi et al, 1997, Cleaveland, Hampson and Kaare, 2007, Kaare et al, 2009). The control of rabies in dogs through vaccination remains the only cost effective way to sustainably protect human from contacting the disease. This collaborates the findings of Beran (1985), Olugasa, Aiyedun and Emikpe (2011) who argue that vaccination of dogs and cats remains the most important strategy in rabies control and campaigns in Africa, while effective publicity, legislative and judicial support enhance adequate coverage of dog and cat population to reach 70-80% epizootiological baseline.

Table 1a: Anti-rabies antibody titre in sampled dogs (Exotic breeds) in Ilorin, Nigeria

Location	Frequency	%	Titre \geq 0.5eu/ml	Antibody titre (eu/ml) (mean \pm SD)
Ilorin East	82	70.6	43	3.2 \pm 1.2
Ilorin South	10	9.0	0	1.4 \pm 0.0
Ilorin West	24	20.6	14	2.9 \pm 1.2
Total	116	100	57	2.95 \pm 1.2

Source: Survey, 2012

Table 1b: Anti-rabies antibody titre in sampled dogs (Local breeds) in Ilorin, Nigeria

Location	Frequency	%	Titre $\geq 0.5\text{eu/ml}$	Antibody titre (eu/ml) (mean \pm SD)
Ilorin East	48	64.9	15	2.21 \pm 1.6
Ilorin South	15	20.0	2	2.02 \pm 1.2
Ilorin West	11	14.9	7	3.51 \pm 1.0
Total	74	100	24	2.32 \pm 1.5

Source: Survey, 2012

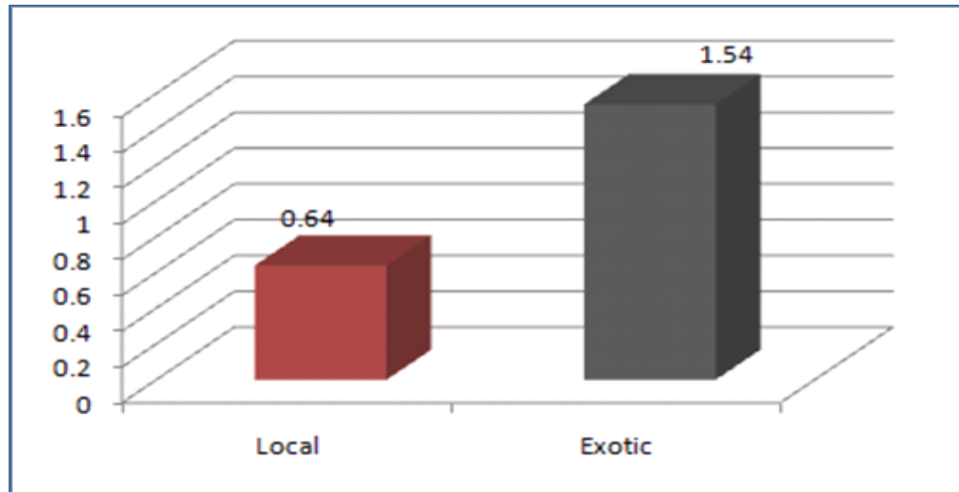


Figure 1: Average Anti-rabies antibody titre in local and exotic breed of dogs in Ilorin

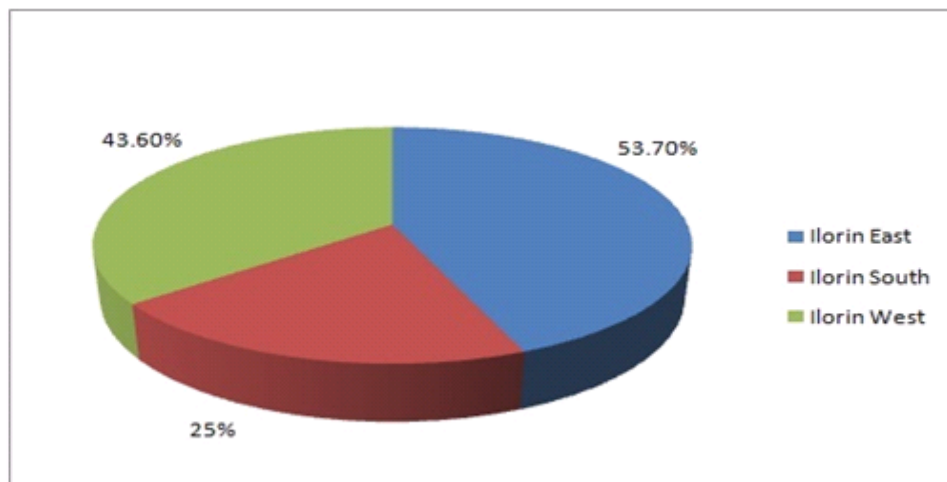


Figure 2: Dogs with antibody titre $\geq 0.5\text{eu/ml}$ in Ilorin.

CONCLUSION

This study is a community-based investigation of rabies antibody profile, it aims at examining how the dogs owners control rabies in Ilorin area of Kwara State, Nigeria. It provides the rabies antibody profile of dogs in Ilorin, Nigeria using an ELISA

technique. The study reveals a seroprevalence rate in the study area. The low prevalence of antibody against rabies observed in this study indicates lack of consistent vaccination programme and/or vaccination failure in some cases in Nigeria. Based on the findings of this study, the control of rabies in dogs through vaccination remains the only cost effective way to sustainably protect human from contacting the disease. Hence, the study concludes that rabies is preventable through vaccination and other measures such as public awareness, responsible ownership of dogs, elimination of stray dog population and sustained collaboration among stakeholders.

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