SHORT COMMUNICATION

Sokoto Journal of Veterinary Sciences

(P-ISSN 1595-093X: E-ISSN 2315-6201)

http://dx.doi.org/10.4314/sokjvs.v17i1.11

Bolajoko *et al*./*Sokoto Journal of Veterinary Sciences*, **17**(1): 82 - 85.

Assessment of risk factors responsible for canine rabies in Oyo State, Nigeria

MB Bolajoko[1]*, I Faramade[1], Y Ibrahim[2] & N Watsamanda[3]

1. *National Veterinary Research Institute, Vom, Plateau State, Nigeria*
2. *Premium Poultry Farms, Kuje, Abuja, Nigeria*
3. *Ministry of Livestock Production, Yola, Adamawa State, Nigeria*

*Correspondence: Tel.: +2349098624092; E-mail: mbbolajoko@gmail.com

Publication History:
Received: 28-07-2018
Accepted:28-01-2019

Abstract

Rabies is an acute viral zoonotic disease of the central nervous system. The disease is recognized in all warm-blooded animals where it is known to cause fatal and irreversible encephalomyelitis leading to death. In this study, we carried out a cross sectional questionnaire-based survey to identify the possible risk factors responsible for transmission and sustenance of canine rabies in Oyo State and to what degree the factors are responsible for transmission of canine rabies. A total of 95 questionnaires were administered directly to dog owners across the state. The Microsoft Excel 2016 and The IBM SPSS 21 were used to determine the descriptive analyses of responses from the respondents and the relative risk (RR) of canine rabies occurrence in households across the state when exposed to each of the identified risk factor. Results revealed that the type of management system adopted for rearing and keeping the dogs is a major factor capable of predisposing dogs to rabies disease. In conclusion, the risk factor identified could be referred to as possible impediment to eradicating rabies in Oyo State. Concerted efforts by the relevant stakeholders including the government and the general-public are therefore germane to elimination of canine rabies in the State. Possible solutions to curtail further spread of the disease in the state were discussed.

Keywords: Canine rabies, Nigeria, Oyo state, Risk factors, Vaccination

Introduction

Rabies is an acute fatal viral zoonotic disease of the central nervous system caused by rabies virus belonging to the family *Rhabdoviridae* and genus *Lyssavirus*. The disease accounts for about 55,000 deaths annually (Knobel *et al*., 2005) and it is recognized in all warm-blooded animals where it is known to cause fatal and irreversible encephalomyelitis leading to death in most cases. According to Oboegbulem (1994), canine rabies was first diagnosed in Nigeria in 1912 and between 1928 and 1990, a total of 3,770 cases of rabies in dogs, cats, farm animals and wildlife had been diagnosed at the National Veterinary Research Institute, Vom - Nigeria (NVRI). Three thousand five hundred and fifty-five (3,555) of these cases were found in the dog alone. Dogs have been identified as the major carrier of the rabies virus in Africa and Asia (Oboegbulem, 1994; Knobel *et al*., 2005; Ratsitorahina *et al.,* 2009: Ehizibolo *et al.,* 2011; Idachaba & Bolajoko, 2018). As such, the dog population in these two continents is critical to the spread and sustenance of rabies within the human-

livestock-wildlife interface. In Nigeria, the dog population has been estimated by RIMS (1992) to be four million five hundred and forty-three thousand and three (4,543,003) with a density of 4.9 dogs /km^2. This figure would have increased tremendously by now given that this livestock census was officially executed 25 years ago, and no such study has been undertaken recently. In this present study, we assessed the risk factors responsible for transmission of canine rabies amongst the dog population in Oyo State while proffering solution to stop further spread of this fatal disease which has grave public health implications.

Materials and Methods

Oyo State is in the southwest geopolitical zone of Nigeria and bounded in the north by Kwara State, in the East by Osun State, in the south by Ogun State and in the West by the Republic of Benin (NPC, 2006). A cross sectional questionnaire-based survey was undertaken amongst dog owners across the state and a verbal consent from the owners was a prerequisite to participate in the present survey. The questions in the questionnaire focused on (1) why and how the owners rear and keep their dogs safe and healthy and (2) owners' knowledge about the mode of transmission, clinical signs, control of canine rabies and where to diagnose the disease in the state. The questionnaire was pre-tested to ensure the comprehensibility of the questions by the dog owners. A total of 102 dog owners were approached across the state and only 95 of them gave their consent and participated in this study. Basic descriptive analyses of the responses from the dog owners were carried out in Excel. The IBM SPSS 21 was used to determine the relative risk (RR) of canine rabies occurrence in households across the state when exposed to each of the identified risk factors. P-value was set at 0.05 to determine the RR for each factor. In this study, the relative risk (RR) indicates how many times (more or less) likely that dog(s) exposed to a given risk factor develop rabies relative to an unexposed dog(s).

$$RR = \frac{Incidence\ of\ rabies\ with\ exposure\ to\ the\ given\ risk\ factor}{Incidence\ of\ rabies\ without\ exposure\ to\ the\ given\ risk\ factor}$$

Interpretation of results of RR:

RR>1: there is increased risk of rabies occurrence; RR = 1: no risk of rabies; RR<1: there is reduced risk of rabies.

Results and discussion

Statistical analyses of the responses from the dog owners revealed that the system of management of dogs and knowledge about rabies and how to prevent the disease are the indicated risk factors for canine rabies spread and sustenance in the state. The measure of the relative risk of each of the indicated risk factors is presented in Table 1 below.

Twenty-three (24%) of the respondents keep one dog at any point in time and the rest always keep more than one dog. Thirty-eight (40%) of the respondents keep dogs only for security purpose; ten (11%) of the dog owners keep dogs for breeding purposes; forty (42%) keep dogs as pets and 7 (7%) respondents keep dogs for no specific reason. None of the respondents slaughter dogs for consumption. From this study, it can be inferred that the residents in Oyo State keep dogs for one reason or the other. This is consistent with the findings of Oboegbulem & Nwakonobi (1989), who reported that people keep dogs for companionship as pets, house guards, assistance for hunting wildlife and as food animal consumed by some people. They however stated that the perceived economic and social worth of dogs depends on the values attached to them by the community which varies from one locality to another. This is a significant observation that borders on the socio-economic-cultural characteristics of the human population, especially, as it concerns

Table 1: Measurements and interpretations of the relative risk for each of the risk factors indicated by the respondents

Risk factors	Relative Risk	P-value	Interpretation
Extensive system of management	1.5	0.05	The extensive system of management increases the risk of canine rabies amongst dogs of the state. The risk is increased by 50%.
Semi-intensive system of management	0.12	0.05	The practice of semi-intensive system of management reduces the risk of canine rabies by 12% amongst dogs of the state.
Intensive system of management	0.25	0.05	Intensive system of management of dogs reduces the risk of the dogs developing rabies in the state. The risk is reduced by 25%.
Knowledge about rabies disease and how to prevent it	1	0.05	The level of knowledge of dog owners about canine rabies and how to prevent it does not change or affect the risk of canine rabies amongst dogs in the state.

formulation of appropriate framework to eradicate rabies in the state.

Forty-five (47%) of the dog owners intensively managed their dogs; thirty-one (33%) of them practice the extensive system of management and nineteen (20%) of the respondents semi-intensively managed theirs. The proportion of dogs reared semi intensively (20%) and extensively (33%) are very high *vis a vis* the role of stray dogs in the transmission of canine rabies. The semi intensive and extensive management of dogs can spread rabies disease through the bite of infected animals, implication of which of is of grave public health importance considering the fact that dog population in Nigeria has been established to be on the increase (Hambolu *et al.,* 2014). Ogunkoya *et al*. (2012) stated that the spread of rabies is further facilitated by free roaming (of extensively kept) dogs coupled with the absence of leash law. These observations are in agreement with the findings of this study. This should necessitate the enactment and enforcement of leash and confinement laws of dogs in Oyo State especially as poor preventive measures of rabies in animals makes spill over to humans inevitable.

Eighty-three (87%) of the respondents know about the mode of transmission, control of canine rabies and where to diagnose the disease in the state and only sixty-one (approximately 74%) of these group of respondents could describe the typical signs of canine rabies. In effect, only 64% of all the ninety-five respondents can be said to know rabies based on the set criteria for this study. These results indicate that the respondents across Oyo state have good background knowledge of rabies as a zoonotic disease of dogs. This finding is consistent with the result obtained by Adejumobi *et al*. (2016) where it was reported that 79.5% of respondent in selected Local Government Areas of Oyo State claimed to be aware of the disease. This perception about the respondents in the present study is evident in the revealed results: where based on the criteria set for this study, sixty-one (64%) of the ninety-five respondents know about the disease, coupled with fact that 30% of the total respondents have witnessed cases of rabid dogs in the past.

Eighty-four out of total respondents constituting 88% are aware of prevention of the disease through vaccination. However, only sixty-nine (73%) of all the ninety-five respondents have record of previous vaccination against rabies, while only 48% of the sixty-nine respondents have record of up to date vaccination. This shows that awareness of rabies does not necessarily translate to taking expected preventive action. This may be due to the cost of anti-rabies vaccination coupled with lack of enforcement of relevant laws by the government. These views are in consonance with the findings of Lembo 2010; Bolajoko *et al*., 2017; Idachaba & Bolajoko 2018). This suggests that prevention of the disease or its complete elimination is possible if all the stake holders including government and the public would cooperate. As suggested in previous studies (Lembo 2010; Bolajoko *et al*., 2017), it appears that the low rate of vaccination in the state is largely due to the fact that money is being charged for anti-rabies vaccination of dogs in the state. The money charged makes it difficult to afford for most of the low-income and rural populace that often form the majority of dog owners in the state. Furthermore, Idachaba & Bolajoko (2018) explained that successful control of rabies is possible via one health approach, where an all-inclusive and participatory platform is provided to ensure that knowledge and aptitude of the people concerning rabies could be utilized through deliberate government policy such as sustained free-annual anti rabies vaccination campaign and the use of mass media and printed visual aids to increase awareness among the illiterates.

In conclusion, the major risk factors identified in this study are the dog management system and antirabies vaccination compliance by dog owners. Since it has been shown that generally, many people in Oyo State are aware of the danger of rabies, concerted efforts should be made by the government and non-governmental organizations to institute sustained free annual vaccination services across the state whilst working to ensure the utilization of the knowledge of the dog owners about rabies to convince dog owners to subscribe to annual vaccination of their dogs from accredited animal health care providers. As a preventive measure, this will reduce the risk of human fatalities. The practice of semi intensive or extensive management system should be discouraged and ultimately eradicated. The culture of responsible dog ownership characterized by intensive system of management should be canvassed and adopted by dog owners. If these impediments are removed, the goal of eradicating rabies in Oyo State to meet the worldwide vision of a rabies free world by the year 2030 would be achievable. Therefore, concerted efforts by the relevant stakeholders are hereby advocated to achieve this feat.

Conflicts of Interest

The authors declare they have no conflict of interest.

References

Adejumobi OA, Omobowale OC, Olaogun SC, Omobowale TO & Nottidge HO (2016). Perception of rabies among residents of selected Local Governemnt Areas of Oyo State, Nigeria. *Journal of Veterinary Advances*, **6**(5): 1242-1250.

Bolajoko MB, Ahmed MS, Okewole PA, Kumbish P, Muhammad M & Fyfe J (2017). Prevalence and demographic distribution of canine rabies in Plateau state, Nigeria, 2004 – 2009. *Bulletin of Animal Health and Production in Africa*, **64**(1): 129-138.

Ehizibolo DO, Ehizibolo PO, Ehizibolo EE., Sugun MY & Idachaba, SE (2011). The control of neglected zoonotic diseases in Nigeria through animal intervention. *African Journal of Biomedical Research* **14**(2): 81-88.

Hambolu SE, Dzikwi AA, Kwaga JKP, Kazeem HM & Umoh JU (2014). Rabies and dog bites cases in Lagos State of Nigeria: A Prevalence and Retrospective Studies (2006-2011). *Global Journal of Health Science*, **6**(1): 107–114.

Idachaba SE & Bolajoko MB (2018). The need for one health approach towards rabies control in Plateau State, Nigeria. *Sokoto Journal of Veterinary Sciences*, **16**(2): 98 - 101.

Knobel DL, Cleaveland S, Coleman PG, Fevre EM, Meltzer MI, Miranda ME, Shaw A, Zinsstag J & Meslin EX (2005). Re-evaluating the burden of rabies in Africa and Asia. *Bull World Health Organi*. **83** (5): 360-368.

Lembo T, Hampson K, Kaare MT, Ernest E & Knobel D (2010). The feasibility of canine rabies elimination in Africa: Dispelling doubts with data. *PLOS Neglected Tropical Diseases,* doi:10.1371/journal.pntd.0000626.

NPC (2006). National Population Commission, 2006 Population and Housing Census, Priority Table Vol. III, Population distribution by Sex, State, LGA, & Senatorial District. Pp 64-66.

Oboegbulem SI (1994). *Rabies in Man and Animals*. First edition, Fidelity Publishers, Enugu, Nigeria.

Oboegbulem SI & Nwakonobi IE (1989). Population density and ecology of dogs in Nigeria: A pilot study . *Review of Scientific Techniques*: *Office International des epizootics* **8**(3):731-745.

Ogunkoya AB, Audu SW & Osinubi MOV (2012). Two fatal cases of rabies as a result of bites from apparently healthy dogs. *Proceedings of the World Rabies International, Global Alliance for Rabies Control*, WEBINAR.

Ratsitorahina M, Rasambainarivo JH & Raharimanana S (2009). Dog ecology and demography in Antananarivo, 2007. *BMC Veterinary Research*, **5**(1), 21.

RIMS (1992). Nigeria National Livestock Resource Survey (IV Vols.). Report by Resource Inventory and Management Limited (RIM) to FDL&PCS, Abuja, Nigeria. Pp 11-28.