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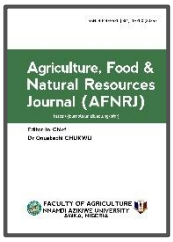

Short Communication

Supported vaccination campaigns as panacea for rabies elimination: A case report

OPEN ACCESS

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ABSTRACT

Rabies, a zoonotic, transmissible viral disease of all warm-blooded animals, including humans, has continued to claim the lives of both animals and humans. Dogs have been identified as a major link for the continuous transmission of the disease; however, canine anti-rabies vaccination has proven to be pivotal in breaking the chain of transmission. A minimum of 70% anti-rabies vaccination coverage is required to create herd immunity. We conducted a supported anti-rabies vaccination campaign in the Nigeria Police Force Veterinary Clinic, Ilorin, between 28th September and 7th October 2022, supported by the Department of Veterinary Services, Kwara State Ministry of Agriculture. A total of 38 animals were presented; 37 were vaccinated, comprising 36 dogs and a cat. We declined vaccinating a dog due to its recent vaccination status. 56% of the vaccinated dogs were males; 24-25-month-old dogs dominate the vaccinated dogs with 25%. German shepherds and Caucasians were the most vaccinated dog breeds, and 72% of all the dogs have never been vaccinated. We concluded that supported free anti-rabies vaccination campaigns are important in achieving rabies elimination by 2030.

KEYWORDS: *One health, Rabies elimination, Supported vaccination, Vaccination coverage*

INTRODUCTION

Rabies is an acute, fatal viral nervous disease that infects domestic and wild animals and is equally transmissible to human with very high case fatality rate reaching 100% in unattended cases(Burgos-Cáceres, 2011; Okoh, Agada, & Amali, 2017; Taylor & Nel, 2015). It has been recognised as a major health challenge, a key One Health issue and an identified wide-spread disease in Nigeria (Adedeji *et al*., 2010; Pastoret, Gucht, & Brochier, 2014). It is caused by an RNA virus of the family *Rhabdoviridae* and genus, *lyssavirus* (Taylor & Nel, 2015). The two forms of rabies are classic furious rabies and

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paralytic rabies. Victims with furious rabies compared with those with paralytic rabies tend to have shorter survival (Hemachudha *et al*., 2013; Jackson, 2013). Hampson *et al.*, (2015) estimated that canine rabies causes approximately 59,000 human deaths globally, over 3.7 million disability-adjusted life years (DALYs) and 8.6 billion USD economic losses annually. In humans, symptoms include tingling, prickling, or itching feeling around the bite area. After a few days, neurologic symptoms ensue, which include irritability, excessive movement or agitation, excessive salivation, confusion, hallucination, muscle spasms, unusual posture, seizure, weakness or paralysis of some part of the body and extreme sensitivity to bright light, sound or touch. If left untreated, case fatality usually reach 100% (Taylor & Nel, 2015).

Anti-rabies vaccination is pivotal to the planned global rabies elimination goal by 2030 with a minimum canine anti-rabies vaccination coverage of 70% to achieve the goal (GARC, 2018; Mshelbwala *et al*., 2018). Investment in dog vaccination is the single most effective way of reducing the disease burden. Mass canine vaccination programs that achieves a minimum of 70% vaccination coverage during annual campaigns have proven to be cost-effective in controlling zoonotic rabies in endemic, resource-poor regions (Lavan, King, Sutton, & Tunceli, 2017).

Anti-rabies vaccination coverage of 51% was reported in a study on knowledge, attitude and practice about rabies prevention and control conducted by Sambo *et al.* (2014) in Tanzania. Another researcher discovered that coverage in six selected villages in Tanzania as at 2012 was estimated at 25% (Bardosh, Sambo, Sikana, Hampson, & Welburn, 2014). Wallace *et al*. (2017b) reported canine-rabies vaccination coverage of 36.1% in Uganda as at 2003. Mshelbwala *et al.*, 2018 in an ecology study reported that 77.3% and 47.2% of respondents in the semi-urban and urban areas respectively had no certificate confirming vaccination against rabies. Atuman *et al*. (2014) reported 26.4% vaccination coverage during his survey in Bauchi State, Nigeria. Akano *et al.*, 2022 reported anti-rabies vaccination coverage of 30.2% in Osun State while 42.6% canine anti-rabies seroprevalence was reported in Ilorin, Nigeria (Olugasa, Aiyedun, & Emikpe, 2011). However, to effectively and sufficiently control rabies, a coverage of not less than 70% is required (Mshelbwala *et al*., 2018). All the reported coverage reports are much lower than the minimum required coverage for effective control and thus may disrupt the planned elimination. Lembo *et al*. (2010) identified Low priority given for disease control as a result of lack of awareness of the rabies burden; epidemiological constraints such as uncertainties about the required levels of vaccination coverage and the possibility of sustained cycles of infection in wildlife; operational constraints including accessibility of dogs for vaccination and insufficient knowledge of dog population sizes for planning of vaccination campaigns; and limited resources for implementation of rabies surveillance and control as reasons for the lack of effective canine rabies control in Africa.

Therefore, as part of the global effort at eliminating rabies, supported vaccination campaign was carried out. At the Nigeria Police Force Veterinary Clinic, Ilorin, Kwara State between 28th of September 2022 and 7th of October 2022.

CASE REPORT

The supported anti-rabies vaccination campaign was carried-out at the Nigeria Police Force Veterinary Clinic (NPFVC), Ilorin, Kwara State between 28th of August 2022 and 7th of October 2022. The vaccination campaign was at no cost to the clients. The Nigeria Veterinary Research Institute produced anti-rabies vaccines and other consumables were supplied by the Department of Veterinary Services, Kwara State Ministry of Agriculture while the venue and personnel were provided by the NPFVC, Ilorin.

A total of 38 animals were presented by various clients, 37 were vaccinated against rabies comprising of 36 domestic dogs and one domestic cat. One dog was however denied vaccination due to the fact that it is not due for the vaccination.

Age: The age of the vaccinated cats was 24 months, while the age of dogs was presented in table 1 below;

Table 1: Age range of dogs presented and vaccinated against rabies (n=36)

Age Group (Months)	Frequency	Percentage
6 – 11	9	25%
12 – 23	7	19%
24 – 35	10	28%
36 – 47	3	8%
48 – 59	3	8%
60 – 71	2	6%
72 – 83	1	3%
84 – 95	0	0%
96 – 107	1	3%
Total	36	100%

Sex: Sex of the vaccinated cat is male while the sex of the vaccinated dogs is presented in the figure below:

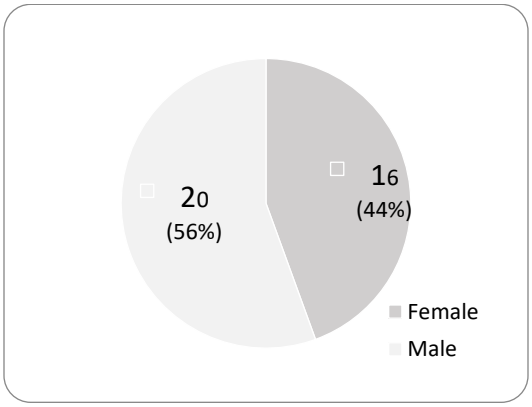

Figure 1; Sex of dog presented and vaccinated against Rabies (n=36)

Breed: the vaccinated cat is a mongrel and the breeds of the dogs are presented in Table 2 below;

Table 2: Breeds of dogs presented and vaccinated against rabies (n=36)

Breed	Frequency	Percentage
Boerboel	2	6%
Caucasian	9	25%
German Shepherd	9	25%
Lassa Apso	3	8%
Local Breed	11	31%
Rottweiler	1	3%
Samoyed	1	3%
Total	36	100%

Anti-rabies Vaccination History: The cat had history of anti-rabies vaccination. Vaccination history of the vaccinated dogs is presented in Figure 2.

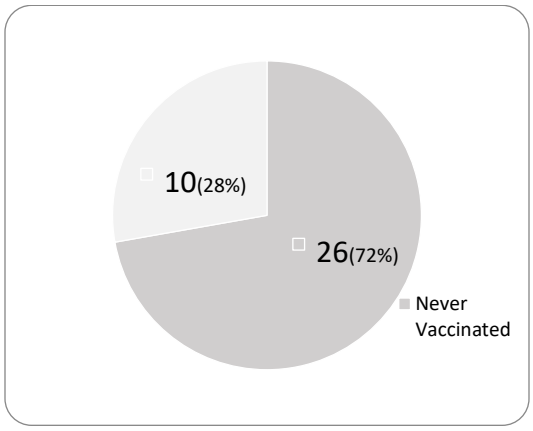

Figure 2: Vaccination history of dog presented and vaccinated against Rabies (n=36)

Also, among dogs with previous vaccination history, anti-rabies vaccination has been due for a booster for between 1-24 months before the campaign was conducted.

LGAs of Dog Residence: The vaccinated cat was from Ilorin East local government area (LGA) of Kwara State. LGA of residence of the vaccinated dogs are presented in Table 3;

Table 3: LGA of residence of dogs presented and vaccinated against rabies (n=36)

LGA of Residence	Frequency	Percentage
Ilorin East	9	25%
Ilorin south	12	33%
Ilorin West	15	42%
Total	36	100%

Clinical signs: All clinical vitals of all the presented and vaccinated dogs and cat were within normal range. Rectal temperature of the vaccinated dogs' range between 37.7 ºC and 40.0 ºC with mean temperature being 38.9 ºC. The cat rectal temperature was 38.7 ºC.

DISCUSSION

Rabies elimination will remain a mirage and near impossible if canine vaccination is not supported. With anti-rabies coverage reports of 51% and 25% by Sambo *et al.* (2014) and Bardosh *et al.*, 2014 respectively in Tanzania, 36.1% in Uganda (Wallace *et al*., 2017), 26.4% and 30.2% in Bauchi and Osun States Nigeria respectively (Akano *et al*., 2022; Atuman *et al*., 2014) and of 42.6% canine anti-rabies seroprevalence in Ilorin, Nigeria (Olugasa *et al*., 2011) are a source of worry as they fell below the expected minimum effective vaccination coverage that is able to confer herd immunity and resultant rabies elimination.

In the course of our supported anti-rabies vaccination campaign, we equally observed that 72% of all the dogs presented had never been vaccinated against rabies before that time which becomes a source of worry to the planned elimination of the disease by 2030 (Cleaveland & Hampson, 2017; GARC, 2018). However, with the supported vaccination campaign, we were able to reach and vaccinate this cohort of dogs that have never being exposed to the vaccination.

Therefore, we recommend that government at all levels along development partners should work together to promote and organise more supported anti-rabies vaccination campaigns across zones where rabies disease is still prevalent.

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Author's Contributions

OATA developed the concept and conducted the campaign. OATA, BOA, and GSA jointly developed the manuscript and conforms the manuscript to AFNRJ format. JOA supervised all the activities. All authors listed read, reviewed and approved the manuscript, agreeing that its content may be readily and freely available to any scientist wishing to use them for non-commercial purposes.

Ethical Statement

Not applicable

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