



Science

KNOWLEDGE AND PRACTISE REGARDING DOGS AND RABIES AMONG FULANI CATTLE HERDING COMMUNITIES IN ZARIA ENVIRONS, NIGERIA

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Abstract

Rabies is a viral disease transmitted mainly following the bite of a rabid dog. Dogs are increasingly being kept for security of livestock among cattle herders. The study was conducted to assess the knowledge, attitude and practise regarding dogs and rabies among the cattle herding community to identify gaps regarding knowledge of rabies transmission and plan intervention. Questionnaires were prepared and administered by face to face interview among members of the communities. Responses were scored based on a marking scheme and observations documented. There was poor knowledge and bad practise regarding rabies and dog ownership. Most of the dogs were not vaccinated against rabies. Furthermore, there was a practice of swapping dogs for household items among members of the community and dog dealers. This has grave implication because it will drive reckless dog ownership for the sole purpose of obtaining desired household items. This coupled with poor vaccination of dogs will lead to increased chances of rabies transmission. There is a need for educating this group on the role of dogs in rabies and vaccination of the dogs in the community.

Keywords: Knowledge; Practice, Rabies; Fulani; Cattle Herding; Nigeria.

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1. Introduction

Rabies is an acute disease of all warm blooded animals characterised by encephalomyelitis, and death is a usual sequel (Radostits *et al.*, 1995). It is caused by members of the family *Rhabdoviridae* and genus *Lyssavirus*. The prototype is the rabies virus (RABV) which is the first of the seven genotypes that are recognised (WHO, 2005). Being a highly fatal viral zoonosis and

with one of the highest disability adjusted life-years (WHO, 2005), it is worrying to note that the disease is endemic among the dog population in Nigeria and rabies outbreaks have been reported (Fasanmi, 2004). The main route of transmission is following a bite when the virus-laden saliva comes into close contact with broken skin (WHO, 2005) and majority of the dogs are kept without any history of vaccination (Dzikwi *et al.*, 2011; 2012). The economic losses resulting from rabies are huge (Knobel *et al.*, 2005) and it is regarded as a global problem. Aside from the tens of thousands of human lives that are lost annually (55,000-70,000), millions of dollars are spent either in attempts to control the disease or from pre-and post-exposure treatments (WHO, 2005). Agricultural losses are also recorded from livestock that become affected directly by the disease (Rupprecht *et al.*, 2006).

Dogs exist in almost all communities and settlements across the country. Unfortunately, majority of these dogs are poorly catered for and voluntary vaccination is low. Over 99% of human exposure to rabies occurs following a dog bite (WHO, 1992). Since dogs associate closely with humans and many of them are poorly managed, potential human exposure to the infection is therefore high. In Nigeria, people keep dogs for several purposes ranging from serving as family pets, household security purposes, breeding for sale especially exotic breed of dogs, for security of livestock among cattle herders and even for consumption among many tribes in several regions of the country.

The Fulani are a major ethnic group in Nigeria and are predominantly cattle and sheep herders. Many of them are nomadic, moving across the country at certain periods in search of food and water for their animals (Majekodunmi *et al.*, 2014; www.gamji.com, 2017). They are often neglected or missed during social and health campaigns (www.gamji.com, 2017) since they are usually located at the peripheries of urban and rural areas. Because they herd animals, they also keep dogs to serve chiefly as security for their animals (Majekodunmi *et al.*, 2014). It is common to find more than one dog alongside the animals grazing. These dogs may not be vaccinated against rabies. It means that if the dogs get infected, the cattle, the herders and their families may be exposed since all mammals are susceptible to the disease. Because the nomadic Fulani are a special group of people, and by location they are disadvantaged since they can hardly access medical care, they need special intervention with whatever services, being medical, veterinary, educational etc.

In the past in Nigeria, between 1944 and 1977, rabies was confirmed among farm animals including 15 cattle, eight goats, four each of sheep, pigs and horses and two donkeys. The sole propagating animals were believed to be the less-catered for herding-dogs and stray dogs around pastoralist settlements. It is also suspected that wildlife may be involved in transmitting the disease (Okoh, 1981). More recently in 2012, rabies was reported among a pastoralist community in Bauchi State, Nigeria, where a dog kept for herding livestock developed rabies and five cattle were bitten. Out of the five exposed animals, one developed the disease and was confirmed to be rabid on testing by fluorescent antibody techniques (FAT) (OIE, 2012).

Since these kind of cases are sporadic and the incidences reported are usually lower than the actual situation (Okoh, 1981; 2007), it is therefore needful to assess the knowledge, attitude and practice about rabies among pastoralist (Fulani) settlements so that definite preventive measures can be instituted to ensure the safety of the herding-dogs, pastoralist families, their livestock and the general public.

2. Materials and Methods

The study was carried out in two settlements belonging to Fulani cattle herders around Zaria namely Rukan Ardo and Sabon Fege. Rukan Ardo is located between N11⁰ 09.716' and E007⁰35.985', and has a population of about 50 people, while Sabon Fege is located between N11⁰ 09.276 and E007⁰35.961' made of about 40 people (personal contact with the representatives). A forth-coming individual was identified in each settlement to serve as an assistant. In addition to cattle, some members of the community keep goats, sheep and local chickens. The men herd the cattle while the women mostly engage in selling fresh milk or fermented milk (*kindirmo*) and a local millet meal called *fura*.

Forty adults, both males and females who consented to the study and were willing to participate were included in the study. A questionnaire that sought information on demographics, knowledge, attitude and practice about rabies was designed. The questions were framed in simple language, using a close-ended format. They were pre-tested among 10 persons from the communities to assess reliability and repeatability.

These questionnaires were administered by face to face interview. The questions were translated to Hausa language (the major language spoken in Northern Nigeria) and where the respondents did not speak Hausa, a Fulani assistant was used to translate the questions to the local language. Two people conducted the interviews after harmonisation of their interview methods to eliminate interviewer bias.

Permission for the study was sought from the local authorities i.e the Ardo's representative (The *Filani*) and the household heads.

The data obtained from this study was analysed using the Statistical Package for Social Sciences (SPSS) version 16. The responses were marked to determine correct and wrong responses to the questions where applicable. Where multiple correct answers existed, they were categorised to determine how many correct answers the respondents knew and they were graded based on this. Where there are seven correct answers, 1-3 were graded as poor, 4-5 as fair and 6-7 as good.

3. Results and Discussions

A total of 40 people (44% of the population) were interviewed, out of whom 25 (62.5%) were males and 15 (37.5%) females. Three (7.5%) were students, nine (22.5%) were housewives while majority of the respondents (24, 60%) were herders. Six (15%) said their livestock have been affected by the disease in the past. Among the respondents, 28 (70%) lived in compounds that own at least one dog and all (100%) of those who keep dogs said it was for security purposes ie to guard their livestock (Table 1).

Both settlements in this study were small as is usual for this ethnic group who live in small numbers and usually closely knit. The settlements were made of about 5 to 20 houses but with several households in each house ie the houses had several families made of aged parents, married male children with their nuclear families and unmarried young boys and girls.

In a study of pastoralist Fulani in Plateau state, Nigeria, all of the 66 households researched kept livestock. In addition, they kept chickens for consumption or sale. Dogs were also kept for either security or hunting purposes (Majekodunmi *et al.*, 2014).

Thirty respondents from this study (75%) said rabies can infect humans and 18 (45%) of respondents knew only three out of seven signs associated with rabid dogs. Fourteen (43.5%) of the respondents knew about transmission following dog bite and 19 others (47.5%) associated bite in addition to other means with transmission of rabies. Seven (18.5%) did not know how it is transmitted. Twenty three (57.5%) said rabies was curable and even though 31 (77.5%) said it was preventable, only 13 (32.5%) correctly stated how it can be prevented (Table 2).

Rabies is recognised by this ethnic group with the name “ginajji” and since it is a disease they recognise, they may have their local or traditional means of treating it. This may not necessarily be effective since it is established that the disease has no cure and appropriate and complete regimen of post exposure prophylaxis is required for its prevention (WHO, 2005).

On their attitudes to dogs (Tables 3 and 4), 11 (27.5%) think that a rabid dog should be killed and thrown away and only three (7.5%) said it can be slaughtered and eaten. Twenty two (55%) said they will report to local authorities. Among respondents, 25 (62.5%) said dog dealers should be responsible for handling rabid dogs in the communities and 20 (50%) said the veterinary personnel are responsible. Only two people (5%) said it was acceptable to sell dogs while 31 (77.5%) said it was acceptable to give out ie swap dogs. Sixteen people (40%) said they will report to the local authority if their dog bites someone. Only 17 (42.5%) knew what to do if someone is bitten by a dog (Table 3). Rabies is grossly under-reported in Nigeria and reports among livestock is limited (Okoh, 1981; OIE, 2012)

The practise among the community revealed that vaccination of dogs is poor as only two (5%) respondents said their dog was vaccinated (Table 5). It should be noted that those who claimed that their dogs were vaccinated had no proof in the form of vaccination certificate or tags and so it is difficult to verify this claim. This may not be the case as some of such claims were proven false when virus neutralising antibodies were absent in a study in the same local government area in the past (Dzikwi *et al.*, 2011).

When a dog is sick, has changed behaviour or just to meet a domestic need, they invite dog dealers to come and collect the dogs (Fig. 1 and 2). In exchange they receive either puppies (which they raise and later sell off when they become adults) or household items such as pressing irons, mats, mobile phones, cooking pots etc. Though they will sell not their dogs, they are however willing to exchange them for a household item.

The Fulani cattle herders are experiencing socio-economic changes in their communities (Majekodunmi *et al.*, 2014). According to a report, 10% pastoralist families are considered to be poor (FEWS, 2004). Where they are considered well to do, their wealth is invested in their livestock making it difficult to meet their daily needs and thus making them vulnerable to diseases and adverse conditions. This group finds it difficult to diversify their source of income (Majekodunmi *et al.*, 2014) to farming, land acquisition and other viable economic activities. It therefore is easy to understand why they may resort to other means of acquiring their household

utensils and other items by swapping their dogs. It was interesting however to note that they considered it wrong to sell their dogs but felt it was acceptable to swap them for other items apart from cash.

Table 1: Demographics of Respondents in the study of Knowledge, Attitude and Practice about rabies in Fulani settlements in Zaria environ

Age group	Number	Percentage (%)
11-20	8	19.5
21-30	23	56.1
31-40	5	12.2
41-50	3	7.3
.>50	1	2.4
Sex		
Male	25	62.5
female	15	37.5
Education status		
None	12	30.0
Formal	10	25.0
informal	18	45.0
Occupation		
Student	3	7.5
Housewife	9	22.5
Herdsman	24	60.0
Farmer	1	2.5
trader	3	7.5
Dog ownership		
0	12	30.0
1	13	32.5
2	13	32.5
>2	2	5.0
Reasons for keeping dogs		
security	31	77.5
pet	0	0
hunting	0	0
Know someone who died after dog bite		
Yes	6	15.0
no	34	85.0
If your livestock had rabies		
Yes	6	15.0
No	31	77.5
Don't know	3	7.5
Total	40	100

Table 2: Knowledge about rabies among respondents in Fulani settlements in Zaria environ

Variables	Number	Percentage (%)
<i>Is rabies transmissible to man</i>		
Yes	30	75.0
No	2	5.0
Don't know	8	20
<i>Signs of rabies⁺</i>		
1 -3 correct (poor)	18	45.0
4-5 correct (fair)	10	25.0
6-7 correct (good)	7	17.5
Don't know (poor)	5	12.5
<i>Mode of transmission</i>		
Bite only	14	35.0
Bite and others ^{\$}	19	47.5
No correct answer	3	7.5
Not applicable	1	2.5
Don't know	3	7.5
<i>Is rabies curable?</i>		
Yes	23	57.5
No	1	2.5
Don't know	16	40.0
<i>Is rabies preventable</i>		
Yes	31	77.5
No	0	0
Don't know	9	22.5
<i>Means of rabies prevention*</i>		
1 correct	10	25.0
2 correct	7	17.5
3 correct	13	32.5
All wrong ^{&}	4	10.0
Don't know	6	15.0
<i>Can rabies infect other animals?</i>		
Yes	19	47.5
No	6	15.0
Don't know	15	37.5
Total	40	100

+Running around, biting, fearless, salivating, change in behaviour, paralysis and pica \$ air-borne, food-borne, water-borne and eating dog meat *wash bite site with soap and water, vaccinate dogs, vaccinate bitten persons & topical application of herbs, topical application of dog parts, kill and eat dog parts, prayers (spiritualists)*

Table 3: Attitude to rabid dogs and response to dog bite in Fulani settlements in Zaria environ

<i>Variable</i>	<i>Number</i>	<i>Percentage (%)</i>
Rabid dogs should be killed and thrown away?		
Yes	11	27.5
No	28	70.0
Don't know	1	2.5
slaughtered for food?		
Yes	3	7.5
no	37	92.5
Killed and buried?		
Yes	12	30.0
No	28	70.0
reported to local authorities?		
Yes	22	55.0
No	16	40.0
Don't know	2	5.0
Swapped?		
Yes	28	70.0
No	6	15.0
Don't know	6	15.0
What should be done if a rabid dog bites someone		
1 correct response*	15	37.5
2 correct responses	17	42.5
No correct response ⁺	7	17.5
Don't know	1	2.5
Total	40	100

*The correct responses include i) Wash with soap and water and ii). Report to healthcare facility + do nothing, go to herbalist, wash with only water.

Table 4: Attitude of respondents to handling rabid dogs and affected livestock in Fulani settlements in Zaria environ

<i>Variable</i>	<i>Number</i>	<i>Percentage(%)</i>
Who should be responsible for handling rabid dogs		
<i>Anyone present</i>		
yes	8	20.0
no	25	62.5
Don't know	7	17.5
<i>Dog dealer</i>		
Yes	25	62.5
No	5	12.5
Don't know	10	25.0
<i>Designated person</i>		
Yes	11	27.5
No	19	47.5

Don't know	10	25.0
<i>Local health officer</i>		
Yes	18	45.0
No	15	37.5
Don't know	7	17.5
<i>Local veterinarian</i>		
Yes	20	50.0
No	11	27.5
Don't know	9	22.5
If your livestock is affected it can be		
<i>Slaughtered for food</i>		
Yes	11	27.5
No	23	57.5
Don't know	6	15.0
<i>Allowed to die</i>		
Yes	2	5.0
No	32	80.0
Don't know	6	15.0
<i>Killed and thrown away</i>		
Yes	0	0
No	31	77.5
Don't know	9	22.5
<i>Sold off</i>		
Yes	21	52.5
No	13	32.5
Don't know	6	15.0
<i>Reported to the veterinarian</i>		
Yes	27	67.0
No	10	25.0
Don't know	3	7.5
Total	40	100

Table 5: Practice of Respondents towards rabies in Fulani settlements in Zaria environs

Variable	Number	Percentage(%)
<i>What do you feed your dog?</i>		
Prepared diet	0	0.0
Family left-over and allowed to scavenge	28	70
Not applicable	12	30
<i>Is your dog vaccinated?</i>		
Yes	2	6.5
No	29	93.5
Don't know	9	22.5
If a dog bites your family member		
<i>Do nothing</i>		

Yes	2	5.0
No	28	70.0
Don't know	6	15.0
Eat dog part	4	10.0
<i>Chase dog away</i>		
Yes	14	35.0
No	23	57.5
Don't know	3	7.5
<i>Report to vet</i>		
Yes	27	67.5
No	10	25.0
Don't know	3	7.5
<i>Report to local authorities</i>		
Yes	14	35.0
No	21	52.5
Don't know	5	12.5
If your dog bites someone, you will		
<i>Beat the dog</i>		
Yes	25	62.5
No	15	37.5
<i>Tie up the dog</i>		
Yes	21	52.5
No	18	45.0
Don't know	1	2.5
<i>Report to local authority</i>		
Yes	16	40.0
No	22	55.0
Don't know	2	5.0
<i>Sell off dog</i>		
Yes	2	5.0
No	38	95.0
<i>Swap dog with dealers</i>		
Yes	31	77.5
No	8	20.0
Don't know	1	2.5
Total	40	100



Figure 1: Children herding cattle with their dog at Sabon Fege (see same dog in Fig. 2)



Figure 2: A dog that was swapped for household items being taken away from one of the settlements

4. Conclusions and Recommendations

It was gathered that there is a practise of exchange or trade by barter between the Fulani and dog dealers from outside the settlements. This practise has serious implication with regards to rabies since the dogs are kept without vaccination history, exposing the Fulani and their cattle as well as the dog dealers who purchase them. Furthermore, it may drive the dynamics of dog ownership

in these communities because of the trade by barter since they may be encouraged to keep dogs just for the purpose of swapping for the household items.

The knowledge about rabies among members of the community is poor and their attitude about reporting cases of dog bite either in humans or cattle is poor. The practices among this group is equally bad and can result in high turnover of dogs which are kept without vaccination history and potentially a source of rabies outbreak in these communities. Rabies education and vaccination of dogs is therefore proposed to target Fulani cattle herder communities.

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