

Epidemiologic Survey Around Dog Bites, Plateau State, Central Nigeria

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Abstract

Rabies is a zoonotic viral fatal disease of warm-blooded animals and occurs due to the bites of animals like dogs, cats, hyenas, jackals against their victims. Rabies remains threat to more than half of the world's population, killing more than 59,000 people yearly mostly in Asia and Africa whilst most of the victims are children. Domestic dogs are responsible for causing over 99% of all human cases. Rabies can be transmitted through biting, scratching wounds, licking of broken skin and mucous membrane from rabid animal saliva to humans and other animals. In this study, ten farmers were randomly chosen and participated from the list of willing farmers from 5 local government areas LGAs, making a total of 50 farmers from the Berom, Tarok and Fulani communities in Plateau state. The population of those farmers who had no form of education combine with those who had least form of education 29(58%) are higher than those who attended secondary and tertiary 21(42%). 36(72%) revealed that ruminants have been the major victim of dog bites cases in the various communities and only 8(16%) said dogs are the most victims. 25(50%) of the respondents says animal can survive and live a normal life after bitten by a dog and 40(80%) believe that human can survive and live a normal life after bitten by a dog. Only 25(50%) of the respondents take their human victims of dog bites to the hospital for proper medical attention; 13(52%) of them had no idea on what to do with their human victims to dog bites before visits to the hospital, 5(20%) wash and dress the wounds of dog bites only and 6(28%) of the respondents' resorts to using traditional methods of caring to dog bites wounds before hospital visits. In conclusion, this present study revealed that dog bite is an indiscriminate public health menace in both humans and animals, with ruminants being the most affected. Majority of the farmers had no idea on what to do with the wounds of dog bite on humans and their animals and this require for more public enlightenment/awareness about the fatality of the disease, its transmission and how the virus persists amongst human and animal populations. The dangers and risks, dog bites pose to the public health in any given community must be clearly explained to the public across all communities in the state and the whole country.

Keywords: central nigeria; epidemiologic survey; dog bites; plateau state; rabies

Introduction

Rabies is a zoonotic viral fatal disease of worm-blooded animals and occurs due to the bites of animals like dogs, cats, hyenas, jackals against their victims. Once clinical signs begin to manifest, death becomes inevitable (1, 4). The disease can be totally prevented by avoiding contact with wild animals and post exposure prophylaxis (PEP) (3). Rabies remains threat to more than half of the world's population, killing more than 59,000 people yearly whilst most of the victims are children (2, 3). Rabies can be transmitted through biting, scratching wounds, licking of broken skin and mucous membrane from rabid animal saliva to humans and other animals (4). The virus affects all mammals, even though variations in susceptibility exist amongst all mammals (4). In humans, rabies is mostly transmitted by canine, cats, mongoose, and bats, also farm animals have infrequently reported to transmit the virus (5). Globally, an unknown number of domesticated ruminants and wildlife die due to rabies besides the fatality and in human most deaths occur in Asia and Africa (6). Domestic dogs are responsible for causing over 99% of all human cases (4). The disease can be prevented in humans Page 3/8

through wound management, prompt administration of PEP and inoculation of rabies immunoglobulin to victims (7). The victims of rabies are mostly children and rural people because they are frequently predisposed to dog bite (8, 9). The control of rabies can be achieved through mass vaccination of domestic dogs (1, 10). PEP is very costly and often not available in a rural area where the disease is more prevalent (10). The World health Organization (WHO) and partners support a target for the elimination of dog-mediated human rabies by 2030 through the control of the disease in dogs (4). The main objective of this study was to; determine whether dog bite is a priority public health problem in communities that are known to keep dog

with other animals in plateau state; and to identify risk factors that make these targeted communities vulnerable to dog bite and what informs the action taken to manage the wounds sustained by victims from dog bites. Previous published studies did not address the segments of different ethnic groups with their cultural beliefs and how these influences their actions toward dog bite incidences particularly in Nigeria.

Materials And Methods

This study was conducted through the administration of questionnaire to randomly selected 50 farmers from list of willing farmers from the farming communities in Plateau state, Nigeria, to ascertain their level of knowledge on dog bite incidence within their communities. Basic descriptive statistical analysis was done using Microsoft® 10 Excel Spreadsheet

Study population

Plateau is a state with many ethnic groups. The state is boasting of having over 40 ethnic groups who are mostly small holder farmers and rear animals in very small numbers. The The Berom are found on the Northern geopolitical zone while the Taroks are found on the southern geopolitical zone. Both ethnic groups keep a significant number of sheep, goats, poultry, pigs, dogs including cattle, even though Fulanis are the most dominant cattle farmers in the state. Additionally, the Fulanis are also known to rear small ruminants and chicken in the state (11). Most of the ethnic communities used dogs for hunting/gaming and for security reasons (11). This study was carried out among major communities that are known to rear cattle, sheep, goat, and poultry in Plateau state, Central Nigeria. It was identified that the major communities that rear cattle, sheep, goat, and poultry are the Berom, Tarok and Fulani communities (11). Administratively, Plateau state has 17 local government areas (LGAs). Thus, as a pilot study, 5 LGAs; Barkin Ladi, Bokkos, Jos South, Langtang North and Mangu were selected purposefully as the Berom, Tarok and Fulani communities are the predominant in these LGAs. 50 farmers were selected from willing farmers from the Berom, Tarok and Fulani communities for this present study.

Community engagement

We carried out preliminary community engagement with the chieftains and elders from the three communities to intimate them about the study and what it aims to achieve for the public health of the community. Information on why the communities were selected were shared with them and explained to them that we need them as contact persons to cascade information to the farmers rearing these animals and keeping dogs in their various communities. Furthermore, we tasked the chieftains and elders to collate farmers that are willing to participate in the study and forward to the study team. The collated list of the willing farmers included both male and female for each community.

Selection of farmers for the study

Ten farmers were randomly chosen from the list of willing farmers that was sent to us by the community leaders in each of the 5 LGAs, making a total of 50 farmers from the Berom, Tarok and Fulani communities. All selected 50 willing farmers gave both verbal and handwritten consent as prerequisite to participate in the study.

Ethical approval

The National Veterinary Research Institute Ethics Committee (NVRIEC) assessed and approved this present research and the experimental protocol. NVRIEC supervised and ensured that the research was carried out in accordance with all relevant guidelines and regulations of the NVRIEC. The NVRIEC ensured this present research followed the guidelines of ARRIVE and that of the Declaration of Helsinki. All the 50 farmers that participated in this pilot study are adults; they all gave their informed consent as a prerequisite before participating in this study.

Results

Educational and cultural background of the farmers Out of the 50 farmers that participated in this study, 14(28%) had a primary education as their highest-level qualification and this represents the largest population among the level of education attained by the farmers, followed by 11(22%) who say secondary school was their highest qualification. Those farmers who had the privilege of attending tertiary education were 10(20%) while Islamic and Adult education had 4(8%) and 2(4%) each representing the least among the type and level of education attended. Those who had no form of education at all were 9(18%). The population of those farmers who had no form of education combine with those who had least form of education 29(58%) are

higher than those who attended secondary and tertiary 21(42%). It was found out that, 31(62%) of the farmers adhere to their cultural practices and ways of life as most still depends on using herbs for wound treatment of dog bites in humans 6(12%) and in animals 9(18%).

Knowledge about dog bites occurrence

Out of the 50 respondents in this study, 38(76%) says dog bites is a problem in their respective

communities and 12(24%) said they have not heard about it in their communities but knows about neighbouring communities who had experienced it in the past. Out of the 50 farmers, 36(72%) revealed that ruminants have been the major victim of dog bites cases in the various communities and only 8(16%) said dogs are the most victims. Out of the 36(72%) farmers who said ruminants are the major victims, Bokkos 9(25%) came first followed by Mangu 8(22%) with Barkin Ladi and Langtang North had 7(19%) each of the respondents and Jos South 5(14%) was the least amongst the 5 local governments.

Population susceptible to dog bites in the community

Of the 50 farmers, 4(7%) says all animals are victims of dog bite. 7(13%) maintained that cattle are the most victims of dog bite, while 12(22%) and 19(35%) of the respondents says goat and sheep are the most victims of dog bite cases in their respective communities. For the human victims from dog bites; 24(48%) of the respondents revealed that it is a serious challenge that needs urgent attention. In the last one year, 18(36%) of the respondent says human victims from dog bites have been recorded.

Susceptible population to dog bites

Out of the 33(66%) respondents who said there are animal victims from dog bites in their communities, 12(36%) says all animals were victims while 11(33%) says young animals were the most victims and adult animals were least 10(30%). For the sex, 18(58%) says both sexes were equally affected, and 12(39%) respondents says females are the most victims but only 1(3%) said males are the major victims of dog bites.

Farmers' perception about post dog bite management and survival rate amongst susceptible populations

25(50%) of the respondents confirm that animal survive and live a normal life after bitten by a dog and 40(80%) also confirmed that human victims of dog bite survive and live a normal life afterwards. Only 25(50%) of the respondents take their human victims of dog bites to the hospital for proper medical attention; 13(52%) of them had no idea on what to do with their human victims to dog bites before visits to the hospital, 5(20%) wash and dress the wounds of dog bites only and 6(28%) of the respondents resorts to using traditional methods of caring of dog bites wounds before hospital visits. Majority 29(58%) of the 50 respondents in this study, had no idea on what to do when cases of wounds from dog bites occurs amongst their animals; 9(18%) decides to apply herbal means of treatment but only 3(6%) reported the cases of dog bites incidence amongst their animals to veterinarians.

Discussion

In this study, most of the farmers confirmed dog bite is a serious problem in their communities and has become a major health threat to both human and other domesticated animals. This is in consonant with other studies that was conducted, (12) that all mammals (warm blooded) are victims of dog bites including poultry (12). Sheep were found to be the highest victims of dog bites which most likely is due to their docile nature and even though all ages are affected, but young animals are the major victims because they are often culturally kept at home together with free roaming dogs. This study also found that females (39%) are mostly affected than the male (3%), this can be explained by the fact that male animals are mainly disposed for slaughter while females are kept and reared for reproduction purposes. The percentages of animals and humans that the respondents confirmed survived and lived a normal life after being bitten by dogs is above average even though the study was limited to verify their claims. Nevertheless, it is an established public health fact, that dog bites pose a great danger to the public

and hence this calls for a concerted effort from all authorities in other to tackle this public health menace. The management of dog bite wounds in human is higher compared to that of animals because most of the human victims are taken to the hospital (51%) unlike in animals where (58%) had no idea on what to do with dog bite wounds on their animals. This is because most of the respondents are from rural settlements where awareness about dangers of dog bites and post management of dog bites in both human and animal victims is lacking or very low. This lack of awareness of public health risk posed by dog bites explains the use of herbal treatment on dog bite wounds by 12% of the respondents in human and 18% in animals, a proportion of the community that cannot be ignored. This present study also revealed that there are very low or no cases of dog bites in animal that are reported to veterinarians and health authorities, and this agree with similar studies conducted (14, 15, 16). It was noticed that ruminants were the major victims of dog bites in Bokkos, followed by Mangu and the least among them is Jos South. This is so because Bokkos and Mangu have a reasonable number of Fulani and who are known to be major custodian of ruminants while Jos South appears to be least because of the natives

therein focus their attention on rearing other animals and poultry.

Conclusion

In conclusion, this present study revealed that dog bite is an indiscriminate public health menace in both humans and animals, with ruminants being the most affected. Majority of the farmers had no idea on what to do with the wounds of dog bite on their animals and this require for more public enlightenment/awareness about the dangers and risk dog bites poses to the public health in any given community. The need to make people seek the help of the hospital rather than depending on their indigenous means of treatment cannot be overemphasised because most of them prefer the use of herbal treatment as the only way out for the treatment of dog bite victims in their communities. Therefore, this calls for a concerted effort through a vigorous mass campaign against this crude method of handling dog bite cases. The present pilot study is limited as it is solely a questionnaire-based survey amongst farmers and there were no other means to triangulate and confirm some of their assertions. However, this study has been able to establish the poor level of awareness among these farming communities that keep dogs about the public health implications of dog bites to both human and the animal populations. A traceback study can be very informative by collation of data from different animal and human hospitals for further evidence-based epidemiologic studies around dog bites.

Declarations

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Authors' contributions

Logyang LE: Field Investigation, Formal Analysis, Writing – Original Draft Preparation & Editing. Olabode MP: Field Investigation, Review & Editing. Haliru H: Field Investigation, Review & Editing. Rayyanu UA: Field Investigation, Review & Editing. Bolajoko MB: Conceptualization, Project Administration, Supervision, Validation, Review & Editing.

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Data availability

Relevant data and information about the present study will be provided on request from the corresponding author.

Consent for publication

Not applicable

Competing interests

The authors declare no competing interests.

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