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Original Research Article

ACTIVE SURVEILLANCE ON DOG BITE AND RABIES CASES IN HOSPITALS AND COMMUNITIES IN UMUAHIA NORTH AND SOUTH LGA OF ABIA STATE

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ABSTRACT

The frequency of non-dog owners was more (48%) compare to dog owners (36%). Out of the (36%) of dog owners, (25%) keep only one (1) dog, (7%) keep only 2 dogs, (3%) keep 3 dogs while (1%) keep >3 dogs. Majority of dog owners keep dogs for companionship (17%), others keep dogs for security (13%) while few keep dogs for hunting (3%). Majority (36%) claimed that between 1-5 dogs were seen in the community, (16%) think it was between 6-10 dogs, few (6%) think it was >10 dogs within the community. the ratio of dog to human is 1:106. Most dog bite were Mongrels (32%), German shepherd (23%) and Caucasian (1%). Most dog bite victims do not know the outcome of the dog (24%), those that think it's still alive (14%), About (11%) think the dog was sold out while (7%) died. Most bites were provoked (30%) while (27%) unprovoked. We recommend intensification on public enlightenment on the risk of dog bite. There is need for veterinarians to improve on advocacy on importance of canine vaccination program especially as it concerns dog owners in-order to promotes global target of eradication of rabies in Africa by 2030.

Keywords: Active surveillance, dog bite, Umuahia North, Umuahia South

INTRODUCTION

Dog bite is a trauma caused by the teeth of a dog and is usually heavily contaminated with microorganism (Jeremiah *et al.*, 2018). Dog bite cases refer to incidence of human exposure to bite from healthy or rabid dog while clinical rabies refers to the condition of classical manifestation of rabies (WHO, 2018). Bite sustained from a rabid dog engender rabies, which is a disease of great public health concern; most human death from rabies have been attributed to dog bite (Peter *et al.*, 2004). According to the Nigeria Centre for Rabies Control (NCRC) (2024), rabies is the most significant public health concern following animal-bites' injuries (NCRC, 2024). Rabies is an enzootic and epizootic disease of worldwide importance (Totton, 2020). The disease is one of the oldest recognized infectious diseases that affects all mammals (Rupprecht *et al.*, 2022). In many countries, few activities are underway to prevent rabies occurrence in humans and to control it in dogs, even in situations of increasing number of human death (WHO, 2004). These situations are tackled by mounting frequent surveillance programs, hence the need for active surveillance on dog bite cases and clinical rabies in Umuahia North and South local government areas of Abia state.

MATERIALS AND METHODS

STUDY AREA

Study Area was conducted in Abia state which is located in the south eastern region of Nigeria. It has seventeen Local Government Areas (LGA) including Umuahia North and South. Umuahia North has its headquarters in the city of Umuahia. It is comprised of up thirty-eight (38) villages boarded by Umuahia North to the North, Ikwuano LGA to the East, Obingwa LGA to the West and Ohafia LGA to the South. It has about 324,900 population projection, about 1,265/km population density and 256.8km area.

Umuahia South LGA has its headquarters in Apumiri in Ubakala. It is comprised of more than forty villages and towns. Umuahia South is located in the Southeastern part of

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Abia state. Umuahia North shares boundaries with Umuahia South LGA to the South, Ikwuano LGA to the East, Isiala Ngwa North to the West and Bende to the North. It has about 202,500 population,141.6km area and population density of 1,430/km. Currently in Umuahia North, there are only two (2) government owned hospitals with over 10 private owned hospitals while Umuahia South has over 10 private owned hospitals and one government owned hospital.

DOG ECOLOGY

The population of dog in each local government area (LGA) was determined from the sampled questionnaire. The ratio of dog to human population was derived from the formula;

Dog population density/human population density

DP =N/A (Dillon & Posey ,2023)

STUDY DESIGN

Ten (10) Villages in Umuahia North and Nine Villages in Umuahia South were purposively sampled through the aid of a well-designed questionnaire. The Villages were selected purposively due to the availability of government owned and private Hospitals.

PROCEDURE

Data collection was obtained through random sampling with a well-designed questionnaire issued to both hospital staff, patients and residents within the communities. The respondents were guarded on how to fill the questionnaire and their responses were collated same day for proper documentation.

DESIGNED QUESTIONNAIRES

Information on dog bite and rabies cases were obtained through a reliable and well-designed questionnaire. The questionnaire was structured with appropriate variables that addressed the research objectives. The reliability test of the questionnaire was 8.0 showing a strong consistency in addressing the research objectives. A total of 100 Questionnaires were randomly distributed to the hospital staffs, visiting patients and towns in Umuahia North and South.

ETHICAL PERMISSION

Ethical approval was obtained from the hospital's administrative department with the help of request letter endorsed by the Head of Department of Veterinary Medicine, College of Veterinary medicine, Michael Okpara University of Agriculture, Umudike. The approval was used in visiting the public health sections of the hospitals. Individual consent was sought for and permission granted by patients and hospital staff.

STATISTICAL ANALYSIS

The data was analyzed using descriptive statistics and represented as percentage frequency of occurrence (%). The prevalence rate was calculated using the formular; number positive/total number of questionnaires administered and result expressed in percentage (James, 2024).

RESULTS

PREVALENCE OF DOG BITE IN UMUAHIA NORTH AND UMUAHIA SOUTH LGA

Out of 100 questionnaires distributed in Umuahia north and south LGA of Abia state, a total of 56 had been bitten by a dog while 28 had no exposure to dog bite.

Prevalence rate = Total number of positive cases\Estimated population

Umuahia North LGA= 56 cases/100 x100

Prevalence of dog bite cases = 56%

PREVALENCE OF RABIES CASES IN UMUAHIA NORTH AND UMUAHIA SOUTH LGA

Out of 100 questionnaires administered only 4% indicated record of mortality of dog bite victims.

There was zero record of clinical rabies in hospitals and communities within Umuahia North and Umuahia South LGA of Abia, Nigeria.

From Table I, the frequency of those that keep dogs (36%) within the study area is less than those that don't keep dogs (48%). Out of the 36% that keep dogs, the majority of them keep only one dog (25%) while only few (1%) keep more than 3 dogs, about 7% keep 2 dogs while 3% keep up to 3 dogs.

Majority of those that keep dogs are for companionship (17%), others keep dogs for security (13%) while a few (6%) keep dogs for hunting.

Most of the respondents (36%) attest to have between 1-5 dogs within their community, about 16% believed they have about 6-10 dogs within their community while just few 6% claim to have more >10 dogs within their community.

Most of the dog bite cases were sustained from mongrels (32%) compared to German shepherd bites (23%), just a few (1%) are from Caucasian.

Majority of victims of dog bite (24%) are not aware of the outcome of the dog, about 14% believed the dog was still alive, 11% believed the dog was sold out, while few (7%) thought the dog died. Most of the dog bit victims re still alive (26%) while just a few (1%) died.

Majority of dog bite cases (30%) were due to provoked bite while lesser cases 27% were unprovoked bite.

TABLE I: DEMOGRAPHIC STUDY ON DOGS WITHIN UMUAHIA NORTH AND UMUAHIA SOUTH LGA OF ABIA STATE

ITEM	VARIABLES	PERCENT (%)
Do you keep dogs at home	Yes	36
	No	48
Number of dogs kept at home	1	25
	2	7
	3	3
	>3	1
Purpose of keeping dogs	Companionship	17
	Security	13
	Hunting	6
Population of dogs in the environment	>10	6
	6-10	16
	1-5	36
Breed of dog involved	Mongrel	32
	Caucasian	1
	Alsatian	23
Outcome of dog, post-bite	Dead	7
	Still alive	14
	Sold	11
	Not sure	24
Outcome of victims of dog bite	Alive	26
	Died	1
	Don't know	1
Provoked bite	Yes	30
	No	27

DISCUSSION

The active questionnaire surveillance recorded a prevalence rate of dog bites cases at 56% which is relatively low rate compared to what was previously recorded 66% from same study area (Nwoha & Ugwuoke, 2017). The marked decrease in the prevalence rate could be attributed to increasing awareness on the dangers associated with dog bite and consistent vaccination campaigns within the study area

Despite the recorded prevalence in dog bite cases, there was no knowledge of record of rabies cases within the community and hospital by the study participants. The 1% mortality recorded on dog bite victims could have been attributed to several health and environmental factors besides rabies because of failure of confirmation of clinical symptoms presented prior to death. This presents a huge gap in the management of dog bite cases, and requires institution of a novel feedback mechanism on dog bite cases to the grassroot for efficient follow up on cases. This also corroborates the earlier work done by Nwoha & Ugwuoke (2017) who reported zero prevalence of rabies within the same study area. within the same study area (Nwoha & Ugwuoke, 2017). This finding supports the assertion that though rabies occurs in most countries in the African continent, but the reported incidence is surprisingly low for an area with such a high population of wild carnivores (Beards, 2021). This finding may seem to indicate that the dog bite cases may simply be due to provoked bites rather than unprovoked bites. This corroborates earlier work done that states that most dog bite cases are provoked (Rosado *et al*., 2008; Bard, 2015). It however differs with the work of Mshelbwala *et al.* (2021), who recorded high rate in unprovoked bites (36.4-97%) in victims.

Table 1 above, shows higher frequency (48%) of residents that do not keep dogs compared to those that own dogs (36%) within the study area. This may be attributed to the existing economic crunch in Nigeria which tends to separate man from his medieval companion. The situation decreases the population of dog and further reflects on the seemingly decrease in incidence of dog bite cases recorded in the study. Dogs have been described as man's oldest best friend (Bernadette, 2013; Gray, 2013). This is confirmed by the high record (17%) of those that keep dogs for companionship compared to those that keep dogs for other purposes for security (13%) and (6%) for hunting. This however differs from the works of Ogbu *et al.* (2020) who recorded higher number of those that kept dogs for security (75.7%) owing to the increasing security challenges in the study area.

It was revealed that most of the residents that own dogs, keep only one dog in their homes. This further buttress the effect of economic challenges associated with poor governance and bad policies which fosters high rate of inflation on basic necessitates and limiting ability of residents to keep and maintain more than one dog. The reason may also stem from efforts made towards curtailing aggressive response and territorial behaviors of dogs (Lindell, 2022). A young maturing dog can pose a social threat to an older dog especially in situations of scares resources and even in abundance resources. Similarly, some adult dogs show aggression to others in response to anticipated perceived threat (Lindell, 2022).

Majority of the respondents (36%) attest to have between 1-5 dogs within their community. This can be extrapolated to represent the ratio of dog to humans in the study area. Since greater number of respondents 36% attest to 1-5 number of dogs in a 527,400 population, the ratio of dog to human comes to1:106. This ratio further portrays the dwindling population of dogs within the study area. This seems to align with the works of Ahmed *et al.* (2023) who recorded a dog-human ratio proportion at 1;16.3 within the study area. It however differs with the records of dog-household ratio of

2:1 within a study area (Ogbu *et al.,* 2020). Most of the dog bite cases were sustained from mongrels (32%) compared to foreign breeds. This equally aligns with the records of Ogbu *et al*. (2020) who observed most dog bite cases sustained from indigenous breed of dogs. This buttresses the fact on economic crunch in Nigeria which limits most residents to keeping mongrels which are relatively cheap to obtain and maintain compared to the foreign breeds.

Majority of victims of dog bite (24%) are not aware of the outcome of dog that bite them. This finding exposes apparent lapses on government to sensitize the public on the need for prompt report of dog bite victims to the hospitals for post exposure prophylactic treatment and to the Veterinary hospitals for follow up through adequate monitoring and surveillances to forestall untoward effects on victims. This challenge often stems from non-presentation of dog bite cases to the appropriate quarters. Dog bite victims are best managed through the one health approach involving the human medics and veterinarians. Surveillances are initiated on the offending dog through restrictions and quarantine processes to ensure effective compliance if rabies must be eradicated from dogs in Africa by 2030. Rabies is classified under World Health Organization's Road maps for the global control of neglected tropical diseases by 2030 (WHO, 2024).

The study recorded a relative decrease in prevalence rate of dog bite cases in Umuahia north and south of Abia state which was attributed to provoked bites on the victims. The zero prevalence in clinical rabies may be due to non-presentation of cases to the hospitals.

We recommend further enhancement on public sensitization on canine vaccination program for sustainability on the decrease status which promotes global target of eradication of rabies in Africa by 2030. There is a need for One health approach involving the veterinary doctors and human medics in handling cases of dog bite. These efforts would ensure effective interventions, sustainability in decrease dog bite and rabies cases and promotes the health and well-being of the community.

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