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Assessment of Level of Awareness of Rabies in Obubra Local Government Area, Cross River State, Nigeria

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ABSTRACT

The study assessed the awareness of rabies in Obubra Local Government Area of Cross River State. Structured questionnaire (N=123) were administered to respondents in three council wards viz Obubra Urban (n=48), Ochon (n=45) and Ovonum (n=30). Descriptive statistics was used to examine the frequencies and temporal patterns of rabies occurrence while the chi-squared test was used to evaluate the association between seasons and rabies incidence in the area. Dog ownership is high in Urban (42%) than Ochon (36%) and Ovonum (22%). Most (80%) dogs are kept as pets and for security purposes. Incidence of rabies is high (68.3%) and was not associated with seasons ($P\text{-value} = 0.31 > 0.05$). Vaccinations were higher in Ochon (45%) than Urban (34%) and Ovonum (21%). About four (78%) cases of rabies were recorded in hospitals and private clinics. High vaccination cost and lack of awareness and income are the reasons why most dogs are not vaccinated.

Keywords: Rabies, dog, incidence, infection, vaccination.

INTRODUCTION

Rabies is zoonotic and fatal viral disease of all warm-blooded mammals. It is responsible for the death of humans and wildlife for many years, and is still a public health hazard in many parts of the world, particularly Nigeria. It is one of the most recognizable zoonosis and has been well known for more than 4,300 years (Takayama, 2005). It is caused by the rabies virus (RABV) which belongs to the family *Rhabdoviridae* in the genus *Lyssa* virus. While rabies has been controlled throughout most of the developed world, it remains a significant burden in developing countries, causing a large number of animal and human deaths (Ekanem, Eyong, Philip-Ephraim, Eyong & Adams, 2013). Animals especially dogs are the most common sources

of human rabies infection. Skunks, raccoons, bats, cats, coyotes, foxes, and other mammals can also transmit the disease. The RABV is known to cause fatal encephalomyelitis in all warm-blooded animals including mammals and usually results in death if unattended. It is transmitted from infected animals to other animals and humans through bite or scratch wounds, licking of broken skin and mucous membranes (MacLachlan & Dubovi, 2011). The distribution of Rabies virus is worldwide, although no case has been reported in Japan and New Zealand. Many are now considered to be free of the disease after eradication campaigns (MacLachlan & Dubovi, 2011). Rabies continues to claim the lives of humans yearly especially in developing countries of Africa including Nigeria despite the

availability of effective human and animal anti-rabies vaccines (Knobel *et al.*, 2005).

According to the World Health Organization (2013), the annual number of human rabid deaths globally is about 61,000, with the vast majority of deaths occurring in rural areas. More than 10 million people undergo post-exposure prophylaxis every year, and rabies ranked 12th on the World Health Organization list of major killer diseases (Meslin & Stohr, 1997). An International Office of epizoonotics (OIE) lists the disease as a threat to human populations and animals in many parts of the world. They further reported that most of the disease occurs in developing countries particularly in Asian countries. Rabies represents an economic burden for both developed and developing countries due to the costs of human post exposure treatment, diagnosis, surveillance, and immunization of domestic animals and wildlife. However, the most serious losses are the number of humans suffering and killed by rabies disease. In Nigeria, dogs are the main reservoirs accounting for more than 96% of rabid animals (Otolorin, Umoh & Dzikwi, 2014).

In most developed countries, human rabies has dramatically declined over the past years due to direct consequence of routine vaccination of pet animals, whereas most developing countries are still battling with the disease. It is therefore important to investigate the level of awareness, incidences as well as the prevention of the disease.

Materials and Methods

The study was carried out in Obubra Local Government Area of Cross River State. It is situated in the Central Senatorial District of the State, and lies between latitude 5° 45^I N and 6°15^IN of the Equator and longitude 8°12^I E of the Greenwich Meridian and has a total land area of about 1115km² with a projected population of 182,546 for 2019 (NBS, 2017).

Sampling Technique and Sample Size

Three (3) out of the eleven (11) wards in the study area were purposively selected due to accessibility, each one representing the three

political blocks of Obubra, Osopong, Adun and Okum. The sampled wards included Obubra Urban, Ochon and Ovonum. One hundred and twenty three (123) questionnaires were administered to respondents based on the population size in each council ward in the study area; forty-eight (48) in Obubra Urban, forty-five (45) in Ochon, and thirty (30) in Ovonum council wards. The questionnaire which were in three sections were administered to households, workers in health facilities and dog owners. The study population was subjected to Taro Yamane (Otabo & Obahiagbon, 2016) sample formula in order to get the sample size for the research.

$$n = \frac{N}{1 + N(e)^2}$$

Where; n = Sample size, N = Sample population, e = Significant level of 0.05.

Data analysis

The data generated from the study was analyzed using descriptive statistics to examine the frequencies and temporal pattern of rabies occurrences in the study area. The time series plots were created to visualize possible trends and seasonality. The expected numbers of cases was calculated under a null hypothesis that rabies incidence is independent of seasons in the study area. The chi-squared test was used to evaluate the association between season and rabies incidence in the study area.

Results

Demographic Characteristics of Respondents

The study reveals that 88% of the respondents own dogs, while 80% keep dogs as pets and for security purposes respectively. The study also revealed ownership of dogs for more than one year, with the dogs kept under chain mostly during the night (Figure 1). No human population in the study area had ever been vaccinated against rabies.

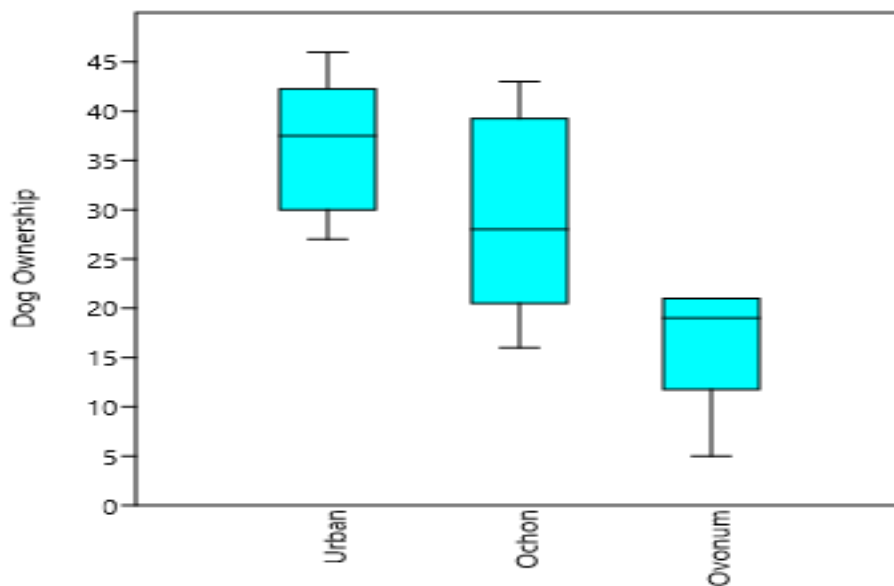


Figure 1: Box plot showing ownership of Dogs in the study area.

Rabies incidence and seasonal variability in the study area

There were incidences of rabies in communities in the study area, and the disease was prevalent in both the rainy and dry

seasons (Table 1). Human related deaths have also been recorded within the communities in the study area, with cases treated in the hospitals, clinics and health centers.

Table 1: Seasonal variation and rabies incidence among respondents in the study area

S/N	QUESTION	SA	A	U	D	SD	Mean	Remark
1	Have you had of any rabies incidence in your community?	40(200)	44(176)	17(51)	13(26)	9(9)	3.8	Agree
2	Is rabies common during the rainy season?	10(50)	32(128)	46(138)	18(36)	17(17)	3.0	Agree
3	Is rabies common during the dry season?	8(40)	36(144)	45(135)	23(46)	11(11)	3.1	Agree
4	Has anyone died of rabies in your community?	17(85)	39(156)	27(81)	29(58)	11(11)	3.20	Agree
5	Is the number of rabies death between 1 - 2?	8(40)	20(80)	45(135)	42(84)	8(8)	2.8	Disagree
6	Are the number of rabies death more than 2?	15(75)	18(72)	43(129)	37(74)	10(10)	2.9	Disagree
7	Do you treat rabies cases in the hospital/clinic/health center	23(115)	32(128)	31(93)	11(22)	26(26)	3.1	Agree
8	Do you treat rabies cases with herbs?	8(40)	16(64)	31(93)	23(46)	48(48)	2.4	Disagree

SA= STRONGLY AGREE (5), A= AGREE (4), U= UNDECIDED (3), D= DISAGREE (2), SD=STRONGLY DISAGREE (1) Agree, if mean ≥ 3.0 , Disagree if mean < 3.0

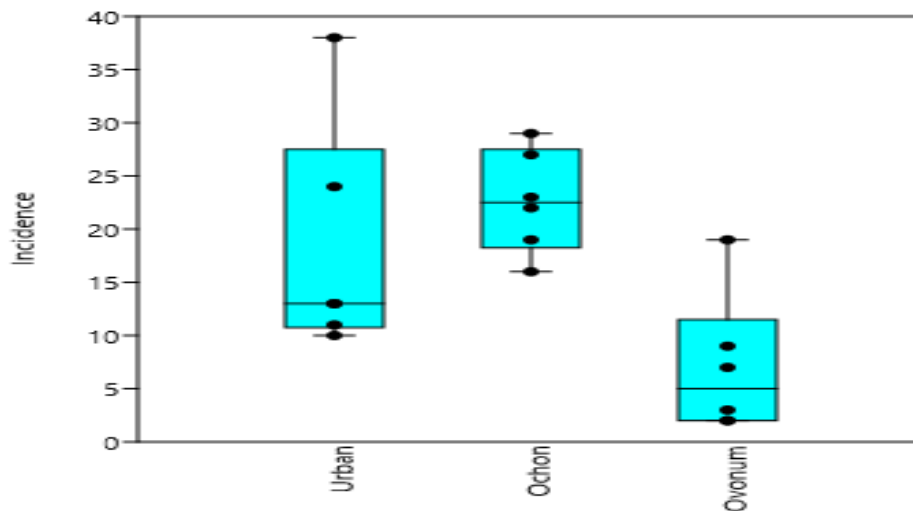


Figure 2: Box and Jitter plot showing incidence of rabies in the study area. Incidence is highest in Ocho than Obubra Urban and Ovorum.

Management of Rabies in the study area

The respondents agreed that their dogs were vaccinated against rabies every one to two years, with cost of vaccination rising a little over five thousand (Table 2). The study also reveals the factors responsible for the

reduction in rabies cases in the study area to include awareness creation, routine vaccination, availability of drugs and vaccines, as well as provision of health facilities.

Table 2: Reduction and management approaches of rabies among respondents in the study area

S/N	QUESTION	SA	A	U	D	SD	Mean	Remark
1	Do you vaccinate your dog(s) against rabies?	40(200)	41(164)	14(42)	24(48)	4(4)	3.7	Agree
2	Do you vaccinate your dog(s) every year?	27(135)	39(156)	24(72)	22(44)	11(11)	3.4	Agree
3	Do you vaccinate your dog(s) after every 2 years?	21(105)	21(84)	35(105)	39(78)	7(7)	4.9	Agree
4	Is the cost of vaccinating your dog(s) less than N 3000	11(55)	35(140)	33(99)	37(74)	7(7)	3.0	Agree
5	Is the cost of vaccinating your dog(s) more than N 5000	12(60)	29(116)	36(108)	31(62)	15(15)	2.9	Agree
6	Do you think awareness creation can reduce rabies cases?	26(130)	39(156)	18(54)	26(52)	14(14)	3.3	Agree
7	Can free and routine vaccination reduce cases of rabies?	32(160)	36(144)	17(51)	19(38)	19(19)	3.3	Agree
8	Can availability of drugs and vaccines reduce rabies cases?	30(150)	38(152)	21(63)	22(44)	12(12)	3.4	Agree
9	Provision of health facilities can reduce rabies cases?	29(145)	32(128)	20(60)	20(40)	22(22)	3.2	Agree

SA= Strongly Agree (5), A= Agree (4), U= Undecided (3), D= Disagree (2), SD= Strongly Disagree (1)
Agree, if mean ≥ 3.0 , Disagree if mean < 3.0

Rabies case management and treatment by health facilities in the study area

All health facilities agreed to have received between 1 and 5 (78%) rabies cases in their facilities, with no deaths recorded in any of the facilities in the study area (Table 3). The

study also reveals that vaccines and drugs for the treatment of rabies were not available all the time in the health facilities. The study also reveal that incidences of rabies in the study area are not associated with seasons ($P\text{-value} = 0.31 > 0.05$).

Table 3: Reported cases and Human treatment of rabies by health facilities in the study area

S/N	QUESTION	SA	A	U	D	SD	Mean	Remark
1	Have you had any rabies case in your facility?	7(35)	1(4)	0(0)	1(2)	0(0)	4.6	Agree
2	Have you had between 1 to 2 rabies cases in your facility?	7(35)	0(0)	0(0)	2(4)	0(0)	4.3	Agree
3	Have you had more than 5 rabies cases in your facility?	5(25)	1(4)	0(0)	2(4)	1(1)	3.8	Agree
4	Have you recorded any death?	0(0)	2(8)	0(0)	6(12)	1(1)	2.3	Disagree
5	Was the death between 1 to 2?	0(0)	0(0)	0(0)	6(12)	3(3)	1.7	Disagree
6	Was the death more than 5?	0(0)	0(0)	0(0)	6(12)	3(3)	1.7	Disagree
7	Do you have vaccines or drugs for rabies cases all times?	1(5)	1(4)	0(0)	5(10)	2(2)	2.3	Disagree
8	Do the vaccines or drugs cost less than ₦ 3000?	1(5)	2(8)	1(3)	3(6)	2(2)	2.7	Disagree
9	Do the vaccines or drugs cost more than ₦ 5000?	2(10)	0(0)	1(3)	5(10)	1(1)	2.7	Disagree

SA= Strongly Agree (5), A= Agree (4), U= Undecided (3), D= Disagree (2), SD= Strongly Disagree (1). Agree, if mean ≥ 3.0 , Disagree if mean < 3.0

Challenges of vaccination and treatment of dogs by hunters in the study area

The hunters interviewed agreed that they use their dogs for hunting, and that their dogs were vaccinated against rabies with anti-

rabies vaccines (Table 4). The cost of vaccinating the dogs was less than five thousand naira. Lack of awareness and money was the reasons sometimes their dogs were not vaccinated.

Table 4: Factors affecting dog vaccination and treatment by hunters

S/N	QUESTION	SA	A	U	D	SD	Mean	Remark
1	Do you keep dog(s) for sale as meat?	7(35)	2(8)	0(0)	0(0)	0(0)	4.8	Agree
2	Do you use dog(s) for hunting?	9(45)	0(0)	0(0)	0(0)	0(0)	5.0	Agree
3	Do you vaccinate your dog(s) with anti-rabies vaccines?	2(10)	2(8)	5(15)	0(0)	0(0)	3.7	Agree
4	Do you vaccinate your dogs in the hospital/clinic/health center?	2(10)	2(8)	5(15)	0(0)	0(0)	3.7	Agree
5	Do you vaccinate your dogs with local herbs	0(0)	0(0)	0(0)	7(14)	2(2)	1.8	Disagree
6	Is less than ₦ 3000 the cost of treatment?	0(0)	1(4)	0(0)	6(12)	2(2)	2.0	Disagree
7	Is above ₦ 5000 the cost of treatment	0(0)	0(0)	1(3)	7(14)	2(2)	2.1	Disagree
8	Is lack of awareness the reason you don't vaccinate your dogs?	1(5)	2(8)	2(6)	4(8)	0(0)	3.0	Agree

9	Is lack of money the reason you don't vaccinate your dogs?	2(10)	3(12)	2(6)	2(4)	0(0)	3.6	Agree
10	Is lack of drugs the reason you don't vaccinate your dogs?	0(0)	1(4)	2(6)	5(10)	1(1)	2.3	Disagree

SA= Strongly Agree (5), A= Agree (4), U= Undecided (3), D= Disagree (2), SD= Strongly Disagree (1). Agree, if mean ≥ 3.0 , Disagree if mean < 3.0

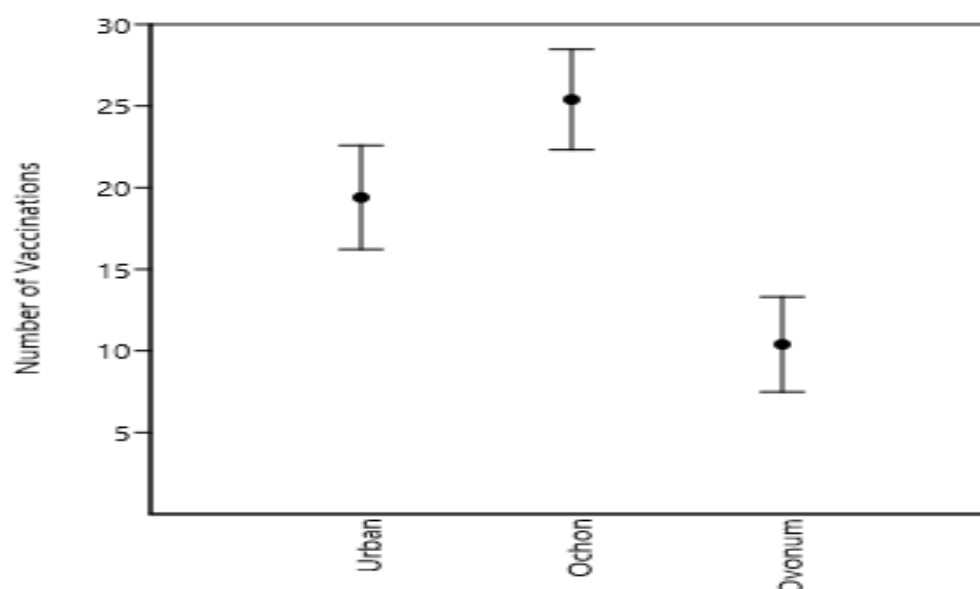


Figure 3: Mean and Whisker plot showing number of rabies vaccination in the study area. Number of vaccinations are higher in Ocho than Obubra Urban and Ovomum.

Discussion

Wild animal diseases are becoming a global issue and a source of concern in developing countries. People living in rural communities with little or no knowledge of these diseases are the worst hit. Rabies is one of the diseases prevalent in rural areas with majority of the people keeping dogs either as pets, security, for meat and even using dogs for hunting wild animals. Thousands of people die yearly due to rabies as most people and dogs are sometimes not treated nor given any form of medication or vaccinated against the disease (Otolorin, Umoh & Dzikwil, 2014). The rabies vaccine is supposed to be given to those with high risk of coming in contact with the disease, or given after a bite from animal suspected to be carrying the disease (Karshima, Kujul, Ogbu, Abdullateef & Dung, 2013). In this study no one had ever received vaccination against rabies in the

study area, thereby increasing the chances of vulnerability after a bite. Persons vaccinated may have been absent during the survey. Eighty percent of the people in the study area own dogs, with the dogs put under chain during the day, implying that dog bites occur at night. However, it is common knowledge that over ninety percent of houses in rural areas do not have perimeter fences, with stray dogs seen roaming the streets all day (Garba, Oboegbulem, Junaidu, Magaji & Umoh, 2010).

Rabies cases are common, and people have died of the disease according to the study but the people are ignorant of the actual number of deaths in the study area. This could be so as people hardly keep records in rural areas. The study though reveals that rabies cases are usually treated in clinics, hospitals and health centers, in reality there is only one government hospital in the entire area, the others are private clinics and petty medical

dealers who might not really be able to handle such cases especially if they become more severe. Again, the proximity of these rural communities to the health facilities is such that sometimes the victims die before arrival (Kehinde, Adebawale, Olaogun & Olukunle, 2009).

Dogs in the area are usually vaccinated against the disease annually and/or biannually, with the cost of treatment reaching as high as five thousand naira. Especially that most dogs in rural areas are never vaccinated either due to lack of awareness, or people may be aware but may not have the money to pay for the vaccination of the dogs. The claim that dogs are vaccinated against rabies in the study area may not be unconnected with suspicion on the part of the owners for fear they may be arrested for not vaccinating their dogs. No death was recorded in the available health facilities, even though more than five cases each were reported in the facilities. But all suspected cases not recorded and reported by victims in hospitals in different cities across the country were confirmed dead according to Otolorin *et al.*, 2015. Drugs are not all the time available in the facilities to effectively handle cases.

Hunters keep dogs for meat, as well as using them for hunting wild animals in the study area. They also agreed that their dogs are usually vaccinated in the clinics, health centers and hospitals. But it is also common knowledge that hunters in the rural areas are ignorant of the fact that dogs require vaccination and other forms of treatment. Dogs that are not vaccinated if infected, can transmit rabies to hunters kill, and to other animals that may escape bites. This can result to consumers and wounded animals contracting the virus (Adeyemi, Adetunji, James & Alonge, 2005).

However, lack of awareness and money were the reasons why their dogs were not vaccinated, and offenders usually are scared of being arrested and prosecuted, especially if authorities discovered they hunt animals with dogs that are not vaccinated which can be harmful to the rural populace. Studies have

shown that people die of rabies in urban areas where medical facilities are more accessible by the people (Knobel *et al.*, 2005). This can get worse in rural areas where most people are ignorant, lack money to cater for their everyday living, and are not vaccinated against the disease. Vaccines are not always available in the few health facilities available, and if available are usually expensive. This can prevent people from vaccinating their dogs or giving them any other treatment. More so that people keep dogs as pets and for security in their homes (Dzikwi, Garkida & Umoh, 2011).

Though owners of dogs were highest in Obubra Urban, rabies incidence was higher in Ochoa. This may well be due to the fact that, they are more fenced houses in Obubra Urban than Ochoa. Number of vaccinations was highest in Ochoa, but this did not translate to the increasing cases. They are indications that most respondents in the study are economical with the truth with regards to whether or not their dogs were vaccinated.

Conclusion

This study reveals that the rabies virus exists in rural areas, with other studies showing its existence in urban areas. The number of confirmed cases and deaths recorded over the years justifies the fact that the people are in danger if nothing is done to salvage the situation. With the failing security situation in the country and with those living in the rural areas being the most vulnerable, people in the rural areas resort to dogs for security. The virus is zoonotic and economically important with high degree of virulence, high mortality and morbidity rates. This brings to question the effort to check its spread and control. Lack of awareness, finance, drugs and health facilities are challenges militating against effectively checking infestation, spread and possibly control.

It is important that priority be given to this disease by providing all that is needed to put its spread under control, so as to ensure that people living in rural areas and wild animals are not badly affected. When measures are put in place to check the epidemiology of the

disease, the number of incidences can be reduced to the barest minimum.

To reduce incidences of rabies in rural areas, mortality and economic losses caused by the disease the following measures are therefore suggested; effective sensitization and mass mobilization of the people by government. Government and other organizations should carry out free vaccination for humans and dogs against the disease, especially in rural areas to curtail or reduce infestations. Mobile health facilities and drugs should be provided by government and NGOs especially in rural areas to reduce cases to its barest minimum if not eradicated. Health facilities should also be provided by government and NGOs to diagnose and attend to cases on time. There should be an improved regulatory framework on acquisition and keeping of dogs by ensuring that dogs upon purchase are registered. Government should discourage hunting wild animals with dogs especially in rural areas. Offenders of any agreed laws should be prosecuted to serve as deterrent to others.

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