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RESEARCH ARTICLE

INCIDENCE AND MENACE OF RABIES VIRAL INFECTION IN SOUTH EASTERN, NIGERIA

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ABSTRACT

The aim of the study was to ascertain the incidence of rabies viral infection vis-a-viz stem the rate of the spread in our vicinity. Study on the incidence on rabies virus among the vaccinated and non vaccinated dogs in South Eastern, Nigeria was carried out. A total number of 193 dogs were investigated using the Sellers stain technique by examining the brain smears made from hippocampus and cerebellum parts of their brains especially those that died from rabies using a light microscope. Result showed that the vaccinated dogs did not stand the chance of transmitting rabies virus to other dogs, animals and humans from our findings. The disease should be of much concern to the people as it was widespread among animals reservoirs especially dogs being mans close pet, so it was imperative to vaccinate dogs especially by the owners, hence, the low rate of rabies viral infection recorded in our vicinity was as a result of awareness created by health agency and our ancient belief of regarding rearing of dogs as a taboo.

INTRODUCTION

Rabies is a viral disease that causes acute inflammation of the brain in humans and other warm blooded animals (WHO, 2013). Rabies is transmitted to humans from other animals. Rabies can be transmitted when an infected animal scratches or bites another animal or human (WHO, 2013). Rabies virus is a ribonucleic acid (RNA) virus of the *Rhabdoviridae* family. There are different antigenic variants of rabies virus distinguished by laboratory testing. Specific variants tend to occur in specific species of animals, although these variants can be found in other species as well. The virus is easily killed by sunlight, soap and drying, (http://www.phac.aspc.gc.ca/). Rabies is caused by a number of *Lyssaviruses* including: rabies virus and Australian bat lyssaviruses. The rabies virus is the type species of the lyssavirus genus in the family, *Rhabdoviridae,* order *Mononegavirales.* Lyssaviruses have helical symmetry with a length of about 180nm and a cross section of about 75nm (Drew, 2004). These viruses are enveloped and have a single stranded RNA genome with negative sense. The genetic information is packed as a ribonucleoprotein complex in which RNA is lightly bound by the viral nucleoprotein. The RNA genome of the virus encodes five genes whose order is highly conserved: nucleoprotein (N), phosphoprotein (P), matrix protein (M), glycoprotein (G) and the viral RNA polymerase (L) (Finke *et al.,* 2005). The time period depends on the distance the virus must travel to reach the central nervous system (Cotran *et al*., 2005). More than 99% of rabies cases in countries where dogs commonly have rabies are caused by dog bites (Tintinalli, 2010). In Americas, bat bites are the most common source of rabies infections in humans and less than 5% of cases are from dogs (WHO, 2013 and Tintinali, 2010). Rabies meaning to rave i.e madness is a viral infection that causes acute encephalitis in warm blooded animals (Drew, 2004). The rabies virus travels to the brain by following the peripheral nerves. The incubation period of the disease is usually a few months in humans depending on the distance the virus travelled to reach the central nervous system and the symptoms begin to show, the infection is virtually untreatable and usually fatal within days. Lozano *et al*. (2015) published that Rabies causes about 26,000 to 55,000 deaths worldwide per year. More than 95% of these deaths occur in Asia and Africa. Rabies is present in more than 150 countries and on all continents. More than 3 billion people live in regions of the world where rabies occurs (WHO, 2013). In most of Europe and Australia, rabies is only present in bats, (WHO, 2007). Many small island nations do not have rabies at all, (CDC, 2014)

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METHODOLOGY

Study Centre

The laboratory analysis was carried out at the Virology section of National Veterinary Research Institute Vom, Jos, Plateau State, Nigeria/ Enugu State Veterinary Clinic, Enugu

Study Population

A total of 193 dogs were investigated brought in for medical diagnosis reported by their owners of having bitten few persons within a short period of time without provocation and suspected to be illed with rabies from different areas in South Eastern, Nigeria.

Sample Collection

The dogs found to be rabid after clinical observation were muzzled, tagged and quarantined for a period of 10-14 days. They died and their heads were severed from their bodies using a clinical operative saw for proper analysis of their brains. Brain smears were made from hippocampus and cerebellum parts of their brains and was stained with Sellers stain technique using a light microscope examined under an oil immersion lens.

METHODOLOGY

Preparation of Sellers Stain

Two parts of methylene blue (i.e. 2ml) was mixed with one part of Basic Fuchsin (i.e. 1ml) drawn from their bottles and kept in sterile bottles

Procedure

A pair of scissors was used to trim down the fur on the head of the rabid dog to be severed. Brain smears of the hippocampus part of the rabid dog were made on the slides. The slides then were flooded with the Seller's stain on the staining rack on a sink for 1 minute and washed off thereafter the slides were then air dried and the back of the slides were washed off using acetone –alcohol. The preparations were then viewed under ×100 objective of the light microscope.

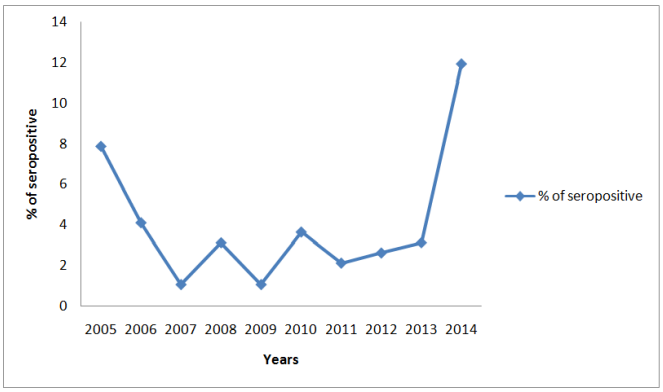

Fig. 1. The percentage of seropositivity of rabies viral infection from 2005 to 2014

DISCUSSION

The finding of our research work revealed that dogs associated with rabies and non rabies exhibited a spread out variance around the mean. This could be attributed to the fact that some areas in our locality banned the rearing of dogs and always regarded the practice as a taboo and this invariably reduced the high incidence of the dogs within these vicinities. The contact between dogs and humans was at averse situation since the infection was a zoonotic infection, many deaths were not recorded in South Eastern, Nigeria due to our almost zero relationship with dogs.

RESULT

Table 1. The correlation between the present and non present

		Present	Not Present
Present	Pearson Correlation	1	.457
	Sig. (2-tailed)		.185
	N	10	10
Not Present	Pearson Correlation	.457	1
	Sig. (2-tailed)	.185	
	N	10	10

Table 2. The descriptive data of the present and non present Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Present	10	2.00	23.00	78.00	7.8000	6.49444	42.178
Not Present	10	4.00	24.00	115.00	11.5000	6.25833	39.167
Valid N (listwise)	10						

Despite the high rate of deaths as a result of rabies viral infection reported globally, then a greater proportion of these cases were from Asia and Africa, (Lozano *et al.,* 2015) even though South Eastern, Nigeria is an extraction of Sub Sahara African Region showed a different pattern. A survey of rabies viral infection was studied in the cause of

carrying out our research work. The survey was for a period of ten years spanning from 2005 to 2014. The data of seropositivity was collected for every year, the trend of the rabies viral infection as shown in our research finding was very erratic for the period under review. The rabies viral infection had the highest pick in 2014 as 11.92%. According to a report for South Africa, it revealed that average death for a period of ten years was 12.90% resulting from rabies infection (Canadian cooperation centre, 2011).

The highest rate of rabies viral infection was recorded in India in 2010 because of the presence of stray dogs in their environment (Dugan, 2008). The low incidence of rabies infection was due to health education in Nigeria as awareness was created by Federal Ministry of Health aimed at reducing the rate of rabies viral infection and also our ancient belief.

Conclusion

There should be programmes supporting regular vaccination of dogs in Nigeria and beyond, these programmes should help to reduce the degree of rabies infections to dogs and also to the public health, therefore, Nigeria having been practicing this phenomenon has a low rate of rabies zoonotic infection among its populace.

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