

A FIFTEEN-YEAR RETROSPECTIVE STUDY OF THE PREVALENCE OF RABIES IN BAUCHI STATE, NIGERIA

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SUMMARY

Records of rabies cases from the 20 Local Government Areas (LGAs) of Bauchi State for fifteen years (1987-2001) were analyzed for trend of exposure. A total of 44 cases of rabies were recorded. Sixty two animals from various species were involved in clinical form of rabies. Out of these, 58 (93.6%) were dogs, 3 (4.8%) sheep, and 1 (1.6%) cow. Fifty seven (98.2%) of the dogs that came down with clinical rabies were adults and 1 (1.8%) was a three-month old puppy. Furthermore, out of the 58 dogs, 43 (74.1%) were stray (free-roaming or ownerless) dogs. Ninety two persons were exposed to rabies by rabid dogs with 5.4% mortality, according to medical reports. The low mortality is due to some precautionary measures taken by some of the victims such as washing of the bite site and medical attention given to them. In addition, 59 animals of different species were also exposed to rabies by dogs. The animals exposed consisted of dogs 18 (30.5%), sheep 17 (28.8%), pigs 13 (22.0%), cattle 8 (13.6%), horses 2 (3.4%) and chicken 1 (1.7%). The study revealed that there were significantly higher cases of rabies during the months of July, August and September. Out of the 20 LGAs of the state, only 13 were affected by rabies within the study period. Ningi and Dass LGAs had the highest number of cases recorded. All the recorded cases are of great public health importance particularly considering the 5.4% human mortality due to rabies observed in the study. In conclusion, mass vaccination, control of stray dogs and public education are recommended as the best way to prevent and control rabies in Bauchi State.

KEYWORDS: Rabies, Cases, Retrospective Study, Bauchi State

INTRODUCTION

Rabies is a highly fatal, zoonotic viral disease of mammals, most often transmitted through the bite of a rabid animal. Reliable data on rabies are scarce in many parts of the world, making it difficult to assess its full impact on human and animal health (WHO, 2006). The vast majority of rabies cases reported each year in the United States is in wild animals like bats, foxes, raccoons and skunks. Domestic animals account for less than 10% of the reported rabid cases, with cats, cattle and dogs most often reported rabid (CDC, 2000). The reverse is the case in most African countries where dogs have been shown to be the principal reservoir and a primary source of human

exposure (Oboegbulem, 1994).

Although human deaths due to rabies are few, the estimated public health costs associated with disease detection, prevention, and control have raised a lot of concern. These costs include the vaccination of companion animals, high risk humans, animal control programmes, maintenance of rabies laboratories, and medical costs such as those incurred for rabies post-exposure prophylaxis. Accurate estimates of this expenditure are not available (CDC, 2001).

Dramatic decreases in human cases of rabies have also been reported during recent years in South America and in some Asian countries,

following implementation of programmes for improved post-exposure treatment of humans and the vaccination of dogs (WHO, 2006). Human fatalities associated with rabies occur in people who fail to seek medical assistance usually because they are unaware of their exposure, lack access to treatment or have no resources for the treatment (CDC, 2002).

Non-lethal exceptions are extremely rare. To date only six documented cases of human survival from clinical rabies have been reported and each included a history of either pre- or post-exposure prophylaxis (CDC, 2001).

Evidence of rabies in Nigeria has long been noted. This is owing to the fact, that every major Nigerian language has a name for dog rabies: Ciwon kare (Hausa), Digbolugi (Yoruba), Ginnaji (Fulani) and Idatebua (Efik/Ibibio), (Nuru, 1973; Umoh and Belino, 1979). Rabies has been reported at one time or the other from all parts of Nigeria (Owolodun, 1969; Banerjee and Elegbe, 1970; Nuru, 1973; Ezeokoli *et al.*, 1981; Ikede and Adeyefa, 1982; Okoh, 1986). Many human and animal cases are probably unreported, especially in rural areas where veterinary and hospital facilities are inadequate (Nuru, 1973). However, reports from other parts of the country (Owolodun, 1969; Banerjee and Elegbe, 1970; Fagbami *et al.* 1981; Okoh, 1986; Ogunkoya, 1997; Coker *et al.*, 2000; Adeyemi and Zessin, 2000) have shown that rabies is one of the major public health problems in Nigeria. World Health Organization commissioned a re-assessment of the burden of rabies in 2004. According to this study the annual number of deaths worldwide caused by rabies is estimated to be 55,000, mostly in rural areas of Africa and Asia. An estimated 10 million people receive post-exposure treatments each year after being exposed to rabies-suspect animals (WHO, 2006).

It is because of the extreme public health importance of rabies and the need by the government and general public to put more effort in the prevention and control of the disease that this study was undertaken. The objective of the study was to analyse the records of reported cases of rabies exposure in the last 15 years in domestic animals and humans in

Bauchi State, in order to determine the distribution of rabies in the state.

MATERIALS AND METHODS

The study area is the twenty (20) Local Government areas of Bauchi State, located $9^{\circ}15'E - 10^{\circ}43'E$ and $9^{\circ}55'N - 12^{\circ}45'N$ in the Northern Guinea/Sudan Savannah Zone of Nigeria. The state has an estimated population of 4 million people, with an annual rainfall of between 875 - 1075mm. Most of the rain falls between June and September, although the rainy season begins actually in May. The hottest month is April, that is, just before rainfall. Maximum shed temperature recorded was $39.6^{\circ}C$. Data were collected on all reported cases of rabies exposure in the state, on local government basis as recorded by the Area Veterinary Officers from 1987 to 2001 and compiled by the Veterinary Directorate of the State Ministry of Agriculture and Natural Resources, located in Bauchi. The data were classified on yearly/monthly and local government bases as function of number of reported cases.

The study variable included year, number of dogs involved, number of other animal species, number of owned dogs, number of stray dogs, number of persons exposed, laboratory results (confirmed and unconfirmed cases), number and species of animals exposed, number of human exposure and death, and number of cases. Occurrence rate of rabies was expressed as percentages.

RESULTS

All the 44 reported cases of this record were spread across 13 (65.0%) of the 20 Local Government Areas that constitute the 3 senatorial districts (geopolitical zones) of the state. Out of these zones, Southern Zone had 6 (47.2%), Central Zone 5 (38.5%) and the Northern Zone only 2 (15.3%) affected Local Government Areas (Fig.1).

A case in this study refers to a situation reported, in which one or more animals have manifested clinical signs of rabies and have been involved or not in biting of humans or other animals, while confirmed cases are those with positive rabies

results from the laboratory. All the 10 samples taken to the laboratory were positive of rabies. The remaining cases were not presented for laboratory confirmation. A total of 62 animals of different species came down with clinical rabies, of which 58 were dogs (93.6%), 1 cow (1.6%) and 3 sheep (4.8%). Out of the 58 dogs that came down with clinical rabies, 57 (98.3%) were adults while 1(1.8%) was a 3-month old puppy. Furthermore, out of the 58 dogs 43 (74.1%) were stray dogs while 15 (25.9%) were owned dogs.

Ninety two persons were exposed with 5 (5.4%) deaths. The year 1997 had the highest number of human exposure, 24 (26.1%), while 1992, 1995 and 1999 had no recorded cases of rabies in the state, according this study (Fig.2.). This showed an average human exposure of 6 persons annually. Out of the 92 persons exposed, 80 (87.0%) were bitten by stray dogs while 12 (13.0%) were by owned dogs. There were no reported cases of human exposure by other domestic animals. The results of our primary investigation showed that,

there was no history of antirabies vaccination in all the animals reported with clinical rabies, except for the cow and 3 sheep earlier mentioned in this report, that were illegally vaccinated with LEP antirabies vaccine by the owner of the animals, after which they came down with the disease. Fifty nine animals of different species were exposed by the rabid dogs. Out of these, there were 18 (30.5%) dogs, 17 (28.8%) sheep, 13 (22.0) swine, 8 (13.6%) cattle, 2 (3.4%) horses and one (1.7%) chicken (Fig.3). The pattern of reported cases on monthly bases for the 15 years revealed that August recorded the highest number of cases with 7 (15.9%) followed by the months of January, July, and September with 6 (13.6%) reported cases each. The month of April recorded 5 (11.4%) cases while March and June had 3 (6.9%) each. Two (4.6%) cases were reported in the month of February, May and December, while October and November had one (2.8%) reported case each (Fig.4)



Fig. 1: Distribution of rabies cases in Bauchi State (1987 2001)

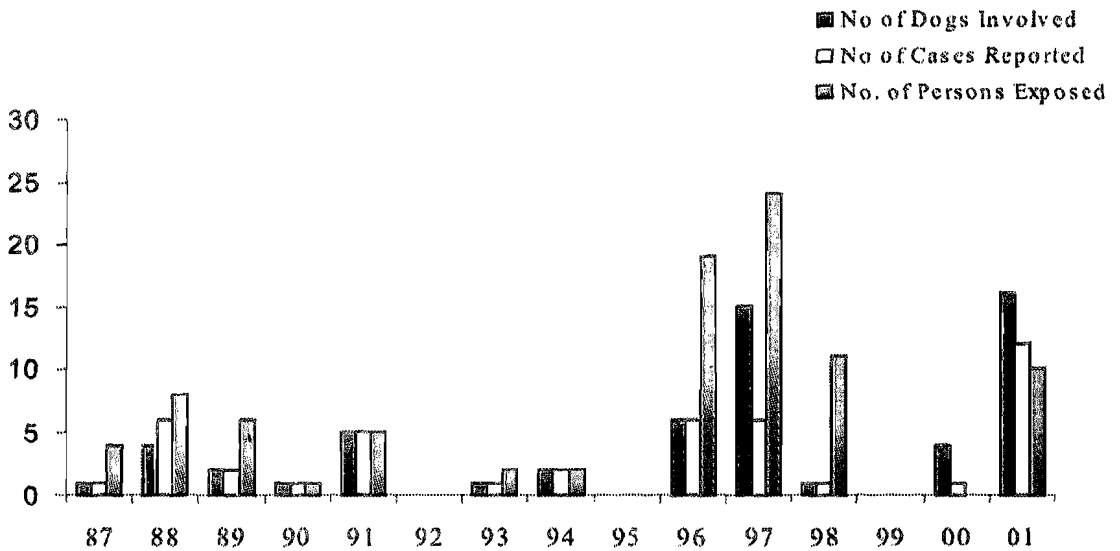


Fig. 2: Yearly distribution of dogs involved, cases reported and human exposure of rabies in Bauchi State (1987-2001)

TABLE I: Reported cases of rabies exposure by Senatorial Districts in Bauchi State (1987-2001)

Senatorial District	No. of Cases	No. of owned dogs	No. of stray dogs	Number of cases		No. of Animals exposed	No. of Human exposed	No. of Human Death
				Confirmed	Unconfirmed			
Northern	2 (4.5%)	1	3 (7%)	-	2	-	-	-
Central	20 (45.5%)	5	16 (37.2%)	5	15	40	46 (50%)	3 (60%)
South	22 (50%)	9	24 (55.8%)	5	17	12	46 (50%)	2 (40%)
Total	44	15	43	10	34	62	92	5

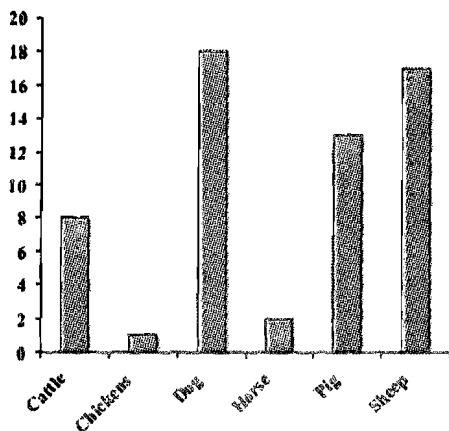


Fig. 3: Number of animals and species exposed to rabies by rabid dogs in Bauchi State (1987-2001)

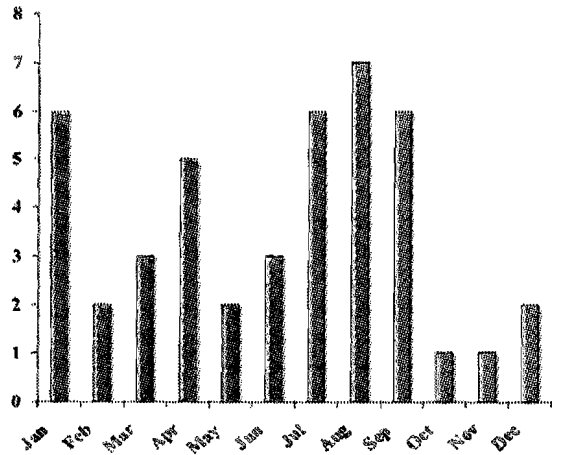


Fig. 4: Number of reported cases of rabies exposure by month in Bauchi State (1987-2001)

DISCUSSION

The LGA in southern zone recorded a total of 22 (50%) cases, while the central zone LGAs had 20 (45.5%). The northern zone LGAs had 2 (4.5%), Tab. 1. The high number of reported cases of rabies in the southern and central parts of the state is, apparently, connected with the culture and religion of the people in these zones. In the northern zone of the state, religious and cultural practices also discourage dog ownership, hence less population of this animal species in this area. The results agree with that of Ezeokoli *et al.* (1981), who obtained similar observation in a survey of rabies prevalence in the former Kaduna State. The presence of Yankari and Lame Bura Game Reserves (although there is no report of wild life rabies till date in these places), which harbour many wildlife may be an important factor responsible for the high number of rabies cases in these zones. The mating season of dogs in the state is predominantly between July and September which coincided with high distribution of rabies cases observed in this study (Fig. 4).

Among the species reported with clinical rabies in this study, dogs were the highest with 93.6%, followed distantly by sheep (4.8%) and then cattle (1.6%). The high prevalence of the disease among dogs may be due to the fact that rabies is endemic in Nigeria and dogs are the major reservoirs (Adiega and Audu, 1998). This finding was again recorded in the present work. This was also in accordance with the work of Oboegbulem (1994), who further reported that, all cited and other reports available show conclusively that in the West African region, the dog accounts for over 90% of animal rabies.

Age distribution of dog rabies has not been clearly determined in Africa. In Nigeria rabies has been reported in eight-week old puppy (Adeyanju and Addo, 1977), furious rabies in a six-week old puppy (Onunkwo *et al.*, 1980).

This study revealed a case of rabies in three-month old puppy, which suggests the possible lack of maternal immunity. Majority of dogs in this study were stray (ownerless, Adeyemi and Zessin, 2000) and/or free-roaming dogs (74.1%) mainly because there was no control of the dogs. This situation has implication for public health in that there was the

constant risk of human exposure to dog bites and rabies.

This study recorded five human deaths from 92 human exposures (5.4%). Rabies is a zoonotic disease of grave public health importance because it is naturally transmitted to man from infected animal sources and it is known to be invariably fatal (CDC, 2001).

The non-vaccination of all rabies suspected dogs, the high rate of human exposure and the 5.4 % human mortality encountered in this study suggested that rabies vaccination covered in Bauchi State was low. This figure is of concern, noting that it represents only reported cases in one state of Nigeria. In some countries such as the UK, only 26 cases of human rabies were recorded between 1902-2005 (Johnson *et al.*, 2005). Therefore, total number of rabies cases that might have occurred in Nigeria in this period would be alarming.

Despite the fact that only cases in dog, sheep and cattle were reported in this study, all domestic species of animals stood the risk of exposure to the rabies virus as this is a disease of mammals. The economic and social losses encountered as a result of the destruction of all exposed animals is of large magnitude during the 15-year period.

In view of the foregoing, it is necessary to conclude that, the system of voluntary, routine rabies vaccination at private and government veterinary clinic in Bauchi State places responsibility solely on individual dog owners to bring their own dogs to the clinics. These types of vaccination are provided for a fee, with issuance of rabies vaccination certificate. This system practically excludes stray (free-roaming) dogs from been vaccinated.

The public health significance of the findings in this work has been highlighted above, including human mortality. However, for effective prevention and proper control of rabies in state, there is the need to ensure more strict and appropriate regulations and licensing, regular and effective control of free-roaming dogs both in the rural and urban areas.

The government should organize and sponsor a mass immunization campaign against rabies throughout the state to prevent or interrupt local outbreaks of the disease. Pet owners should be encouraged to be responsible in taking care of their dogs. The general public must be sensitized through workshops and seminars on the dangers of rabies, how to control its menace and the need to immediately seek medical assistance by all exposed persons.

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