

# **Original Research Article**

## **Cases of dog bite in Aba , Abia state Nigeria and its public health significance**

### **Abstract**

Background: Dog bite cases poses a major public health threat in Nigeria. Majority of the rabies infection occurring in the country in humans are due to bites from dogs, which are mainly local breed of dogs with little or no history of anti-rabies vaccination. Research in Nigeria has established that apparently healthy dog excrete rabies virus in their saliva without showing clinical signs.

Aim: This study was carried out to evaluate cases of dog bite in Aba, Abia state Nigeria and its public health significance

Methodology: Cases of dog bite in humans reported at the Zonal Veterinary Clinic Aba, Abia state Nigeria from 2007 to 2012 was retrieved. Data on cases of dog bites from the Veterinary clinic record were extracted using a structured questionnaire designed for the study.

Result: Out of 215 reported cases of dog bite, 11.6% were victims less than 15 years of age and 44.7% were victims greater than 30 years of age. Local breed of dogs (50.7%) were most involved in the bites, with cross breed (12.6%) being the least. Majority (78.1%) of the dogs involved in the bites were unvaccinated against rabies, with 11.6% having unknown anti-rabies vaccination status. There was no association ( $\chi^2 = 7.38$ ,  $P > 0.05$ ) between the breed and vaccination status of the offending dogs. Dog bite victims were more of males (62.8%) than females (37.2%) with seasonal index showing the greatest values during the months of October to December. Most of the bites (63.7%) occurred on the lower extremities with bites on the abdomen (2.8%) being the least.

Conclusion: The records of dog bite cases in humans indicate the need for public health enlightenment aimed at informing the public on the need to seek proper post exposure prophylaxis treatment when such incidence occur and the need to vaccinate their dogs regularly against rabies.

**Keywords:** dog bite, rabies, Aba, seasonal index

### **1. Introduction**

Rabies is an acute, central nervous system infection, characterized by central nervous system irritation, followed by paralysis and death [1]. It is a fatal viral disease that affects all warm blooded vertebrates [2]. In most African countries dogs have been shown to be the principal reservoir and primary source of human exposure to rabies [3]. Dog bite poses a major public health threat mostly in developing nations [4]. Human fatalities associated with rabies occur

37 in people who fail to seek medical assistance usually because they are unaware of their  
38 exposure, lack access to treatment or have no resources for the treatment  
39 [5]. In some communities in Nigeria most dog bites victims tend to employ traditional means  
40 of treatment which are grossly inadequate hence putting them at risk.

41 Local breed of dogs have been implicated in most dog bite cases, Istifanus [6] reported that  
42 out of the 132 cases of dog bite reported at the Ahmadu Bello University Health Centre Zaria,  
43 Nigeria, 81.8% of the dogs involved in the bites were local breed. About 99% of rabies  
44 infections worldwide have been attributed to bites from rabies infected dogs. A 5%  
45 prevalence of rabies antigen in the saliva and brains of apparently healthy dogs sold for  
46 human consumption in Abia State was reported by Mshelbwala *et al* [7], some of these dogs  
47 are sourced locally from the surrounding locality hence signifying that dog bites are of public  
48 health concern.

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50 The annual number of human rabies deaths globally is estimated in 2010 to be from 26,400 to  
51 61,000 and vast majority of these deaths (84%) occur in rural areas[8.] Rabies post exposure  
52 prophylaxis if given promptly to exposed humans is highly effective, and it includes: wound  
53 cleansing, immunization with a human rabies modern cell culture vaccine, and administration  
54 of human rabies immunoglobulin (HRIG) [9]. Where human rabies modern Cell Culture Vaccines  
55 are not available nerve tissue vaccines are still being used in some African countries, the vaccine  
56 remains widespread in Ethiopia, Algeria still produces nerve tissue vaccines, but the situation  
57 in some other countries in North Africa and in the horn of Africa is unknown[8] these nerve  
58 tissue vaccines are more reactogenic and may cause severe reactions when used. This study was  
59 carried out to evaluate cases of dog bite in Aba, Abia state Nigeria and its public health  
60 significance.

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## 62 **2.0 Material and methods**

### 63 *2.1 Study area*

64 The study was carried out in Aba, Abia state, located in South Eastern Nigeria. Aba is a  
65 major urban settlement and commercial centre in Nigeria. Aba is an industrial zone and lies  
66 between latitudes 5° 07'N and longitude 7° 22'E. Aba is densely populated (The human  
67 population of Aba is estimated at 531,340 according to the 2006 population census). With a

68 temperature of about 21°C, the climate is humid tropical type and is characterized by wet and  
69 dry seasons [10].

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## 73 *2.2 Information on Cases of Dog Bites in Humans*

74 An observational retrospective study was carried out on cases of dog bite reported at the  
75 Zonal Veterinary Clinic Aba, Abia state Nigeria from 2007 to 2012. A structured  
76 questionnaire was designed and all the 215 cases of dog bite reported between 2007 to 2012  
77 were entered in separate questionnaire containing two sections. Section A: includes the  
78 victims information like Age, sex, monthly variation of dog bite cases to determine the  
79 seasonal index and site of bite while Section B: Includes offending dog information like  
80 breed and vaccination status. Seasonal index of reported dog bite cases was calculated using  
81 moving average and ratio. Data generated was analysed using the statistical packages for  
82 social sciences (SPSS) Version 17.0 to carry out descriptive analysis and test for statistical  
83 association between the breed and vaccination status of offending dogs. Data obtained were  
84 presented using tables and charts.

## 85 **3.0 Results**

### 86 *3.1 Distribution of dog bites in Humans by Age and Sex Obtained at the Zonal Veterinary* 87 *Clinic Aba, Abia 2007 – 2012.*

88 Out of 215 reported cases of dog bite from 2007 – 2012, 25(11.6%) were victims less than  
89 15 years of age, 94(43.7%) and 96 (44.7%) were victims between 15-30 years and greater  
90 than 30 years of age respectively (Table 1). Dog bite victims were more of males 135/215  
91 (62.8%) than females 80/215(37.2%) (Table 2). Time series decomposition using ratio to  
92 moving average revealed seasonal fluctuations (Figure 1). Seasonal changes expressed as  
93 seasonal index showed the greatest values during the months October to December. The  
94 lowest indices were observed in February.

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100 Table 1: Distribution by age of humans bitten by dogs obtained from the Zonal Veterinary  
 101 Clinic Aba, Abia 2007 – 2012.

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| 103 | <b>Year</b>  | <b>Age</b>      |                 |                 |
|-----|--------------|-----------------|-----------------|-----------------|
| 104 | <b>S/N</b>   | < 15(%)         | 15 – 30(%)      | > 30(%)         |
| 105 | 2007         | 4(12.5)         | 14(43.8)        | 14(43.8)        |
| 106 | 2008         | 5(8.9)          | 35(62.5)        | 16(28.6)        |
| 107 | 2009         | 8(18.2)         | 17(38.6)        | 19(43.2)        |
| 108 | 2010         | 2(10.5)         | 7(36.8)         | 10(52.6)        |
| 109 | 2011         | 5(13.2)         | 11(28.9)        | 22(57.9)        |
| 110 | 2012         | 1(3.8)          | 10(38.5)        | 25(57.7)        |
| 111 |              |                 |                 |                 |
| 112 | <b>TOTAL</b> | <b>25(11.6)</b> | <b>94(43.7)</b> | <b>96(44.7)</b> |
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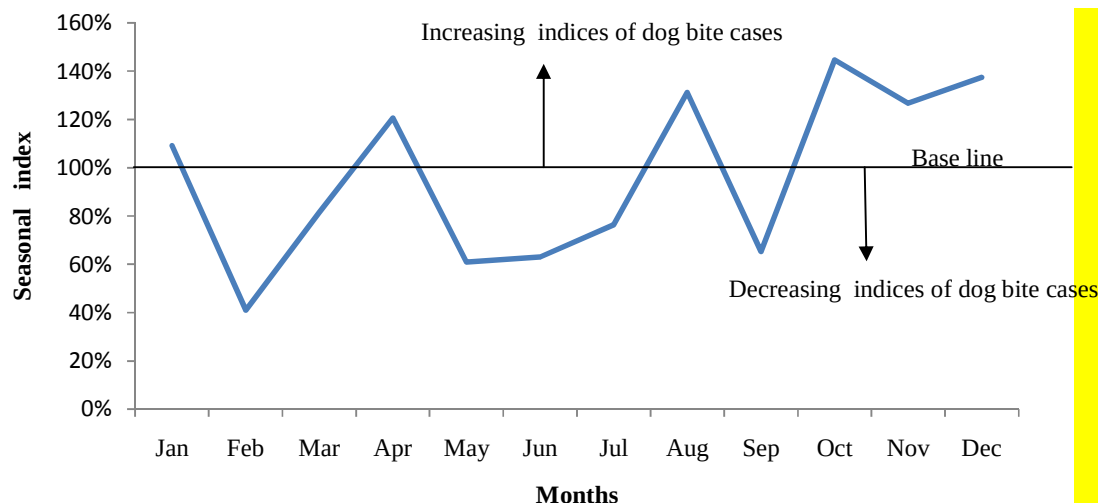
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Table 2: Distribution by sex of humans bitten by dogs obtained from the Zonal Veterinary Clinic Aba, Abia State 2007 – 2012.

| YEAR         | SEX               |                 |
|--------------|-------------------|-----------------|
|              | Male (%)          | Female (%)      |
| S/N          |                   |                 |
| 2007         | 20(62.5)          | 12(37.5)        |
| 2008         | 30(53.6)          | 26(46.4)        |
| 2009         | 26(59.1)          | 18(40.9)        |
| 2010         | 16(84.2)          | 3(15.8)         |
| 2011         | 20(52.6)          | 18(47.4)        |
| 2012         | 23(88.5)          | 3(11.5)         |
| <b>TOTAL</b> | <b>135 (62.8)</b> | <b>80(37.2)</b> |

Fig. 1 Seasonal index of monthly dog bite cases covering the period from 2007 – 2012 obtained from Zonal Veterinary Clinic Aba, Abia state.



## 2.2 Breeds and vaccination status specific rates of offending dogs involved in bite cases and distribution of dog bites by anatomical location on humans obtained from the Zonal Veterinary Clinic Aba, Abia from 2007 – 2012.

The Local breed of dogs 109/215 (50.7%) were the most involved in the dog bites, followed by Exotic breed 79/215(36.7%) and Cross breed 27/215(12.6%) being the least. Also 168/215(78.1%) of the dogs involved in the bites were unvaccinated against rabies (Table 3). Most of the dog bites 137/215(63.7%) occurred on the leg, followed by 55/215(25.6%) on the hand, 17/215(7.9%) on the back and 6/215(2.8%) on the abdomen. Most of the dog bites on the leg, hand, back and abdomen occurred in individual from 15 years and above ( Table 4).

Table 3: Breeds and vaccination status specific rates of offending dogs involved in bite cases reported at the Zonal Veterinary Clinic Aba, Abia from 2007 – 2012.

| Variable                                     | Breed of dogs |           |          | Total     |
|----------------------------------------------|---------------|-----------|----------|-----------|
|                                              | Exotic        | Local     | Cross    |           |
|                                              | n = 215       |           |          |           |
| <b>Breed specific rates (%)</b>              | 79(36.7)      | 109(50.7) | 27(12.6) |           |
| <b>Vaccination status specific rates (%)</b> |               |           |          |           |
|                                              | n = 79        | n = 109   | n = 27   |           |
| Unvaccinated                                 | 60(75.9)      | 90(82.6)  | 18(66.7) | 168(78.1) |
| Vaccinated                                   | 10(12.6)      | 10(9.2)   | 2(7.4)   | 22(10.2)  |
| Unknown                                      | 9(11.4)       | 9(8.30)   | 7(25.9)  | 25(11.6)  |

P-value = 0.117,  $\chi^2 = 7.377$

Table 4: Location of dog bite by age of victims specific rates obtained from the Zonal Veterinary Clinic Aba, Abia State 2007 – 2012.

| Location of bite    | Age of victims  |                 |                 |
|---------------------|-----------------|-----------------|-----------------|
|                     | <15             | 15 – 30         | >30             |
| Leg ( n= 137)       | 16(11.7)        | 60(43.8)        | 61(44.5)        |
| Hand(n = 55)        | 6(10.9)         | 25(45.5)        | 24(43.6)        |
| Back(n=17)          | 2(11.8)         | 7(41.2)         | 8(47.10)        |
| Abdomen(n=6)        | 1(16.7)         | 3(50)           | 2(33.3)         |
| <b>Total n =215</b> | <b>25(11.6)</b> | <b>95(44.2)</b> | <b>95(44.2)</b> |

## Discussion

Cases of dog bite reported to the Zonal Veterinary Clinic Aba , Abia state Nigeria is just a few number of cases out of the many that occurs, as many cases are not reported to the relevant health care authorities, and such dog bite victims do not receive adequate post exposure prophylactic treatment. The reported presence of rabies antigen found in the saliva of relatively healthy dog slaughtered for human consumption in Abia state in a recent study [7] has highlighted the public health risk of dog bites in the study area. Local breed of dogs were more involved in cases reported probably because most of the reported dog bite cases were from individuals living in the adjoining town close to the main city, where the proportion of local breed of dogs is high and where there is little or no restriction in dog movement. Also majority of the dogs involved in the bites were unvaccinated or had

unknown anti-rabies vaccination status posing serious public health concerns. Such local breed of dogs have less chances of being vaccinated as compared to exotic breeds of dogs due to low value place on them, in addition Veterinary Clinics are not evenly spread across the study area where dog owners can easily take their dogs for routine anti-rabies vaccination coupled with poor awareness on the part of dog owners to vaccinate their dogs yearly against rabies.

Frequency of dog bites was predominant within the months of October to December this coincides with the dry season that falls within the breeding period of most dogs where there is an increase in dog movement for the purpose of mating thus increasing straying in dogs and human exposure to dog bite. Most of the dog bites occurred on the leg in agreement with Ojuawo [11] who reported the lower limbs as the commonest site of dog bites. This may also be because during an attack most dogs have easy access to the legs of victims during an attack and these individuals tend to defend themselves with their legs during an attack by an offending dog.

Majority of the individuals that were victims of dog bites were males, this is consistent with results gotten in other parts of Nigeria [12, 13, 14]. Also most of the bites occurred in adults contrary to some studies where children are the most frequent victim of dog bite [15, 16]. This may probably be attributed to male adults being more enterprising and adventurous in their quest to meet up with their needs and the needs of their families and are therefore more exposed to bites as they move from one location to the other within the city transacting one form of business or the other.

### **Conclusion and recommendation**

Dog bites cases occur more in males and adults with local breed of dogs being mostly involved in reported cases. Majority of the dogs involved in the bites were unvaccinated against rabies, and most of the reported cases occurred between October to December.

There is need for adequate record keeping at the Zonal Veterinary Clinic Aba that will take note of vital information of the dog bite victims and information of the offending dogs that may serve as relevant data for public health workers. Also dog owners should be encouraged to vaccinate their dogs regularly against rabies and ensure they restrict their dogs' movement. It is recommended that there should be increased public health enlightenment campaign on the need to seek adequate medical attention in case of dog bite and human anti-rabies vaccine should be provided at an affordable price in all health care centres across the city.

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