

Three Year Old Girl Bitten by a Rabid Dog: A Case Report

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Abstract

Rabies is a viral disease caused by lyssaviruses which mainly affects dogs, transmitted to humans mainly through dog bite and is endemic in Nigeria. It also affects people's livelihood with an estimated loss of over US\$ 500 million on yearly basis due to rabies in livestock. On 17th of October 2017, during the flag off of animal antirabies vaccination programme in Jaji, Igabi local government area of Kaduna state, a 3 year old girl bitten by a stray dog on her left lower arm was brought to the venue of the program by her father. Before she was brought to the venue, the wound she sustained from the bite was washed with water and bandaged. The girl and her father were immediately referred to the hospital to commence rabies post-exposure prophylaxis (PEP). The dog was overpowered and killed by the people in the community and the dead dog was brought to the venue. The head of the dog was decapitated with the use of an axe and was properly packaged in a cold box and transported to the National Veterinary Research Institute (NVRI), Vom, Plateau state, for laboratory diagnosis. Florescent antibody test was used in analyzing the brain sample and the result turned out positive. The result was sent to the hospital where the girl was receiving the PEP and the doctor informed the father about the outcome of the result and the relevance of completing the treatment which the father made sure that the daughter did. Follow up on the health status of the girl from her father on the 28th of November, 2017, revealed that the girl is well and the wound she sustained has healed completely. The increasing incidence of rabies in Kaduna state calls for an extension of antirabies vaccination campaign to other regions of the state and other states of the Federation. The Federal government should continue to support the states with antirabies vaccines and other logistics. A strong multidisiplinary collaboration should be formed between the human and animal health workers under the one health platform. The media (social media, radio and television stations) need to be involved in the process of rabies sensitization for the public to gain awareness towards the control and prevention of rabies. Rabies in Nigeria still remains a major treat to the dog population and public health.

Key words: rabies, florescent antibody test, post-exposure treatment, antirabies vaccination, rabies awareness creation, Kaduna state, Nigeria

1 INTRODUCTION

Rabies is a zoonotic, fatal and progressive neurological infection caused by rabies virus of the genus *Lyssavirus* and family *Rhabdoviridae* (Singh *et al.*, 2017). Rabies has been an endemic disease in Nigeria with vaccination and control of stray dogs as the major control measures. The disease remains one of the most important zoonoses in the country (Kujul *et al.*, 2010; Adedeji *et al.*, 2010, Qasim *et al.*, 2013). Rabies is an acute, contagious and highly fatal disease of all warm blooded animals caused by rabies virus (Ogunkoya, 2010) and has traditionally been associated with dogs more than any other animal (Qasim *et al.*, 2013). In parts of the world where domestic animal control and vaccination programs are limited, dogs remain the most important reservoir of the disease (Qasim *et al.*, 2013), 99% of deaths due to rabies cases in humans are via dog bites in developing countries of Africa and Asia (WHO, 2005) where the disease exists.

Rabies is 100% preventable by ensuring access to life-saving treatment following dog bites; and by vaccinating dogs to reduce risks and ultimately to eliminate the disease at its animal source. Ending human deaths from rabies requires strengthening human and animal health services; and increasing political commitment (WHO, 2017). There is

100% fatality rate once the clinical signs sets in. Over 60,000 people die every year due to rabies, while approximately 15 million people receive rabies post-exposure prophylaxis (PEP) annually (Singh *et al.*, 2017). It is estimated that about 10,000 humans are exposed to rabies each year in Nigeria from dog bites (Nawathe, 1980). The world's poorest are the most affected as they cannot afford treatment or transport for care. The livelihoods of people are also affected when livestock get rabies, which is estimated at a loss of over US\$ 500 million per year (WHO, 2017). Currently, the World Health Organization (WHO), the World Organization for Animal Health (OIE), the Food and Agriculture Organization of the United Nations (FAO) and the Global Alliance for Rabies Control (GARC) revealed plans to end human deaths from dog-transmitted rabies by 2030 (WHO, 2017).

Early 2017, there were reported outbreaks of rabies in Kaduna state which prompted the need to flag off antirabies campaign in the state. The exercise was carried out by the Ministry of Agriculture and Forestry, Kaduna state in collaboration with the Department of Veterinary and Pest Control Services (DV&PCS), Federal Ministry of Agriculture and Rural Development (FMARD) as part of the celebration of the World Rabies Day, 2017. During the

flag off vaccination campaign at Jaji, Igabi LGA, Kaduna State, a little girl bitten by a stray dog was presented by her father at the venue of the event. Investigation on the disease status of the stray dog was done in order to continue or discontinue the post-exposure prophylaxis (PEP) which commenced earlier on by the little girl and to further reiterate the menace of rabies in the society to enable the government re-strategize in the process of curtailing rabies in Nigeria. It is important that the Nigerian government consider rabies control as high priority (Otolorin *et al.*, 2015) and a one health approach should be imbibed in the national rabies control and eradication program.

2 CASE REPORT

On the 17th of October 2017, during the flag off campaign of antirabies vaccination at Jaji, Igabi Local Government Area (LGA) of Kaduna state, a three year old girl who was bitten by a stray dog at Birinin Yero, in Igabi LGA on her left lower arm was brought to the venue of the event by her father. The wound was washed thoroughly with water and bandaged by the parent before their arrival at the venue of the event. Meanwhile, the girl and her father were immediately referred to the DanTsoho hospital to commence rabies post-exposure prophylaxis (PEP). At the hospital, the wound treatment and PEP was carried out according to methods prescribed by the "WHO Guide for Rabies Pre and Post Exposure Prophylaxis in Humans, 2014". Result of the test carried out at the Central Diagnostic Laboratory, NVRI, Vom was positive for rabies and was sent to the hospital where the girl was receiving treatment on the 19th of October, 2017. The father was briefed on the outcome of the result and post-exposure treatment was carried out fully. The PEP lasted a month (One dose of the vaccine administered on days 0, 3, 7, 14 and 28). Follow up was conducted through phone call on

the 28th of November and the father of the girl informed us that she is well and the wound she sustained by the bite was completely healed and only the scar remaining.

3 MATERIALS AND METHODS

3.1 Sample Examination, Collection and Transportation

The stray dog was over powered by the people in the community and was killed and the carcass of the dog was also brought to the venue of the event. Physical examination of the whole carcass was conducted, there was no abnormality noticed. The dog was an adult male and a local breed. The head of the dog was severed from the body and was neatly packaged in a cold box and transported to the Central Diagnostic Laboratory, National Veterinary Research Institute (NVRI), Vom, Plateau state. Craniotomy was performed to collect a portion of the hippocampus for fluorescent antibody test according to the procedure described by OIE (2000) and small fraction of the brain sample was thawed and smeared on a clean slide and air dried. It was fixed in cold acetone for one hour at -20°C. The sample fixed slides were again, air dried and conjugated with light diagnostic antinucleocapsid monoclonal antibody, labeled with fluorescein isothiocyanate rabies fluorescent antibody assay DFA (monoclonal antibody FITC-conjugate), catalog no. 5100, reagent from Chemicon International Inc., incubated for 30 minutes at 37°C in a humid chamber and thereafter excess conjugate removed from the slides by rinsing in 7.4 pH PBS solution for 3-5 minutes and was allowed to air dry. The dried slides were mounted with buffered Glycerol Mounting medium, cover slipped and allowed to dry. Slides were observed for apple green fluorescence examined using a Leitz-Ortholux fluorescence microscope 2 hours after staining.



Plate 1: Three year old girl bitten by a rabid dog and her father at Jaji, Igabi LGA, Kaduna State



Plate 2: Head of the Dog that was sent to NVRI, Vom, Plateau State for diagnosis



Plate 3: Flag-off vaccination banner at Jaji, Igabi LGA, Kaduna state

4 DISCUSSION

The result for the florescent antibody test carried out indicated that the dog was positive for rabies. The PEP which commenced earlier on by the girl was completed due to the outcome of the test result. Earlier this year in Kaduna there were 9 cases of rabies reported and one human death (MAFR, 2017; Saidu, 2017); among the cases reported was the case of a three year old nursing bitch that ended up biting unspecified number of people and 3 six weeks old calves, one died after 5 days and the other tested positive while the 3rd calve was ignorantly sold out by the owner for public consumption (Audu, 2017; Saidu, 2017). Also, there was a dumb form of rabies case in a dog at Yan Katako Sabon Gari market, Tudun Wada, where the people were opening the mouth of the dog and feeding it. In Lagos state, early 2017, two people died of rabies at the Lagos state University Teaching Hospital (LASUTH) and the Lagos University Teaching Hospital (LUTH) respectively, after being bitten by dogs (Adebayo, 2017). In a study conducted by Eke *et al.* (2015), out of 149 cases of dog bites, majority of the offending dogs were stray dogs 86 (57.7%), which attacked their victims unprovoked, in 54.6% of cases while 6 (4.0%) of the cases were confirmed positive for rabies. Furthermore, most of the bites were from dogs with unknown history of rabies vaccination 72 (52.3%), while the case fatality rate was 100% (Eke *et al.*, 2015). A retrospective study by Ehimiyein *et al.* (2014) conducted at the Veterinary Teaching Hospital (VTH), Ahmadu Bello University (ABU), Zaria, over a period of 10 years, revealed a total of 236 dog bite-related cases, eight of the dogs were stray dogs (3.4%), while 228 (96.6%) were owned dogs out of which 71.2% were free-roaming and only 22% of the owned dogs were vaccinated. Those dogs that died of rabies made up 1.7% and the number of cases (59.7%) increased through time with the highest number (32) recorded in 2011. The most common offending breeds included the Nigerian Indigenous local breeds (73.3%), cross breeds (24.6%), Alsatians (0.8%), Terriers (0.8%), and Bulldogs (0.4%)

(Ehimiyein *et al.*, 2014). The afore mentioned cases and studies have indicated that rabies is a serious issue in the Nigerian society and the situation is strongly exacerbated by abundance of stray dogs as stated by Eke *et al.* (2015) and limited vaccination of dogs even though the dogs are said to have owners. Also, majority of the owned dogs are free-roaming, this also calls for the attention of dog owners to have their dogs tamed at home so as to decrease the chances of dog bites in our community. Also, this case report has proved the menace of stray dogs in our society as the dog in question was confirmed positive for rabies. It also goes ahead to indicate the need to confirm the disease status of the dogs (rabies positive/negative) for every case of dog bite in order to reduce human casualties as a result of rabies. Reports from the Central Diagnostic Laboratory, NVRI, indicates the prevalence rate of rabies from suspected cases screened as 52.3 % (103/197) for 2015 with an ovine case of rabies while 2016 had 60.6% (106/175) prevalence rate (all canine species) (NVRI, 2017). The high prevalence rate of rabies indicates the likelihood of a suspected case of dog bite to be rabies (1:2) and the need to report all cases of dog bite in order to commence PEP immediately and also send samples to the laboratory when the dog dies within the period of quarantine which is approximately 2 weeks for confirmation. The endemicity of rabies in Nigeria is further asserted by this case study. Result of deaths due to human rabies recorded in health care Centre's across Nigeria, in 10 states from 1980 to 2014 gave a total of 78 deaths due to rabies based only on clinical presentation (Otolorin *et al.*, 2015). Reported cases of rabies in humans in Nigeria are low; this could be attributed to poor reporting of cases, cultural beliefs, mis-diagnosis of the disease and poor knowledge on the mode of transmission and prevention of the disease (Otolorin *et al.*, 2015). There are increasing numbers of reported cases of dog bites in humans in both rural and urban areas in Nigeria. Published researches in Nigeria have reported deaths in humans due to rabies infection (Otolorin *et al.*, 2015). Poor control of rabies in animals makes it easy for a spill over to the human population. Free roaming/straying

of dogs and absence of leash laws are some of the factors encouraging the spread of rabies from dogs to humans in Nigeria (Ogunkoya *et al.*, 2012; WHO, 2010). Delays in diagnosis greatly increase the number of contacts that require post-exposure prophylaxis (Crepin *et al.*, 1998). In the USA, one case resulted in 209 PEP. The early diagnosis of rabies is also essential to eliminate the expense and discomfort of unnecessary diagnostic tests and inappropriate therapy (Crepin *et al.*, 1998). Early diagnosis of rabies in dogs and other animals is very important as it forms the basis for PEP in humans for the prevention of rabies (Khokhar *et al.*, 2003). While PEP is essential and should be continued with improvement to achieve consistently positive results, progress toward eliminating rabies has been markedly faster in nations that have emphasized preventive vaccination of animals (Adedeji *et al.*, 2010).

The challenges that are encountered in the course of elimination of rabies in Nigeria ranges from: limited logistics, limited supply of antirabies vaccines; limited multidisciplinary collaboration between human and animal health workers; and low level of rabies awareness among the public.

5 RECOMMENDATIONS

The Federal government should continue to support the states with antirabies vaccines and other logistics. As a result of the increasing incidences of rabies in Kaduna state, the state government to extend the antirabies vaccination campaign to other parts of the state. Other states of the Federation should conduct animal antirabies vaccination campaign. There should be stronger multidisciplinary

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collaboration between the human and animal health workers under the one health platform. The media (social media, radio and television stations) needs to be involved in the process of rabies sensitization for the public to gain awareness towards the control and prevention of rabies.

6 CONCLUSION

Rabies is endemic in Nigeria and both animal and human health. Deliberate and purposeful steps needs to be taken in order to eliminate rabies in the country by the year 2030 as stipulated by the global movement towards the elimination of dog mediated human rabies. This case report has indicated the relevance of reporting dog bites and the need to investigate the rabies status (positive/negative) of the dog in question. It is also to note that livelihoods are affected (economic losses) due to dog mediated livestock rabies, hence the need for intervention.

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