

## **DOG-MEDIATED RABIES, AN INCREASING THREAT TO FAMILIES IN KENEMA DISTRICT: A CALL FOR ACTION**

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### **ABSTRACT**

On 5th December 2022, a stray dog attacked and bit five children, aged between 6 to 10 years in the same community in Kenema District. The children suffered multiple wounds on their bodies and were rushed to the hospital for treatment. The dog was killed, head decapitated and submitted to the Central Veterinary Laboratory/Teko, in Makeni, Bombali District, for confirmation of rabies. The sample was confirmed positive using a direct fluorescent antibody test. The victims of the dog attack were rushed to the Kenema Regional Hospital for treatment. Due to the high cost of the rabies post-exposure prophylaxis (PEP) vaccine (rabies vaccine freeze-dried from Liaoning Cheng Da Biotechnology Company Limited (SPEEDA®)), the families could not afford the whole cost of treatment. The victims were only able to receive the first dose of post-exposure vaccination which cost Le 400 per dose (US\$ 20.5 equivalent). Upon the intervention of the Ministry of Agriculture and Food Security, the children received the complete dose. This is just one among many unreported cases of exposure to dog-mediated rabies within the country.

**Keywords:** Rabies, Dog Bite, post-exposure prophylaxis, Kenema District

## BACKGROUND

Tens of millions of people are estimated to be injured by dogs each year globally (1). The physical injury and nature of dog bites are often framed primarily as a medical concern, mainly of human rabies and tetanus infection (1,2). This is because dogs are responsible for over 99% of the transmission of rabies (3,4). Dog-mediated rabies is estimated annually to cause 59,000 human deaths with an associated economic loss of US \$ 8.6 billion globally (4,5). The most common victims of dog bites are children below the age of 15 years and most frequently bitten in the face, neck and head, the most dangerous region, close to the brain. Dog bites are a greater health problem for children than measles (6,7). They are more common than bike accidents, and playground injuries. Globally more than 15 million people receive post-dog-bite treatment that costs about US\$ 1.7 billion annually (8). There is an increase in reported cases of dog bites throughout Sierra Leone by the Integrated Disease Surveillance and Response (IDSR), and Integrated Animal Disease Surveillance and Reporting System (IADSR) in 2022. Over 91.7% of the dog heads submitted for the period 2020-2022, from these incidences for diagnostic confirmation are positive for rabies at the Central Veterinary Laboratory (CVL) Teko (2021 CVL Annual report). The aim of this case report was to describe an incident in which a dog attacked and bit five children between the ages of six to ten in Kenema district.

## CASE PRESENTATION

A dog bite incident occurred on the 5th of December 2022, in Kenema township where a stray dog violently attacked and bit five children, aged between 6 to 10 years in the same community. A stray dog, displaying signs of aggression, appeared to the children in a playing ground. The older children were able to run from the raging dog leaving the vulnerable and helpless kids to be terrorized. Before adults arrived at the scene, the dog had bitten the children, leaving them with severe injuries. This immediately prompted a joint effort of community youths and the Animal Health personnel to search for the dog and killed it. Thereafter, the animal health personnel while observing biosafety requirements, decapitated the dog head and submitted it to the Central Veterinary Laboratory (CVL) for confirmation of rabies. The children suffered multiple wounds on various parts of their bodies. The youngest child (age 6) had multiple and extensive category III bite wounds (broken skin, deep wounds with bleeding) on the face, and neck and whilst the elder brother (10 years) , had similar bite wound on the shoulder. The elder brother was trying to save his younger sister from the attack. One of the children also had his right thumb badly injured as a result of the dog bite, the other kids were either bitten on their legs or arms. The victims of the dog attack were rushed to the Kenema Regional Hospital for treatment. Due to the high risk of victims exposure to rabies virus, the Ministry of Agriculture and Food Security availed five (5) doses of post exposure vaccines.

## DIFFERENTIAL DIAGNOSIS

Dog bites is used as a proxy to rabies surveillance in Sierra Leone. Therefore, cases of dog bites are often investigated and samples collected from suspected dog bite cases for laboratory confirmation.

It is therefore incumbent on the CVL to analyze any sample suspected of rabies within the shortest possible time, and results are sent to the authorities involved to inform on post exposure treatment of the bite victims.

Due to logistical challenges in specimen referral, there was a delay in submitting the sample to the CVL. However, upon receipt, the sample was diagnosed immediately using Direct Fluorescent Antibody (DFA) test and was confirmed to be positive of the rabies virus. The result was immediately disseminated to District Livestock Officer (DLO) in Kenema and other relevant stakeholders, for appropriate medical care.

#### OUTCOME AND FOLLOW-UP

The victims were referred to Kenema Government Hospital for bite wound management and post exposure treatment. Dog bites could lead to local wound infection, tetanus, or rabies that could come from either the saliva of the biting animal, the skin flora of the victim, or the environment (9). Therefore, an antibiotic was administered for wound treatment for bacterial infection, and an anti-rabies vaccine for rabies prevention. Three doses of anti-rabies vaccines were given to each bitten victims for three weeks at one week interval. After intensive wound treatment for the first two

weeks of the incident, the victims continued with follow-up treatment after every two days while monitoring them keenly for any behavior change until fully recovered. There were no reported signs nor deaths in all the dog bite victims at the time of publishing this case report.

#### DISCUSSION

Incidents involving dog attacks on children are quite frequent in Sierra Leone and worldwide. In the Kenema community, the number of children attacked and bitten by dogs is very high, which is also reported weekly by the IDSR and IADSR. Studies conducted at health services in Sierra Leone and elsewhere in Africa indicated a high number of children involved in dog-related incidents (10–12). The vulnerability of the children to dog attacks, as previously reported (1,13,14), is mostly attributed to children's inability to defend themselves, their small stature, and sometimes the children may provoke the attack (15).

Post-exposure prophylaxis of the human rabies vaccine in combination with human rabies immune globulin soon after a bite by suspected rabid dogs is effective in controlling human rabies (16). There was a problem in getting human anti-rabies vaccines for the bitten children. This was partly due to the short in supply of the anti-rabies vaccine (ARV) at the health facilities as well as the high cost of the vaccine. A single vial of anti-rabies vaccine (ARV) costs four hundred Leones (US\$ 20.5 equivalent) and the victims' parents were from the lower socioeconomic classes. In a study in Ado-Ekiti, Southwest Nigeria, only a little above 50% of

the dog bite victims completed the PEP regimen, the probable reason was the high costs of ARV (11).

The Kenema District Livestock Officer had to request from CVL to supply them doses of human anti-rabies vaccines for the victims. The request was honoured and some doses of human anti-rabies were sent to the district because children were involved in the dog bite incident. "The children have the right to live. Any governments should ensure that children survive and develop in a safe environment". Therefore, governments in rabies endemic areas should enforce rabies and dog population control measures to curb dog-mediated rabies (17).

In conclusion, laboratory confirmation of rabies from dog heads submitted from cases of dog bite incidence, is alarming. It is a threat to humans and other susceptible animals. There is need for a One Health approach involving community stakeholders, laying emphasis on awareness raising on responsible dog ownership and vaccination of dogs. Dog bites are of public health concern because dogs are responsible for over 99% of rabies transmission (18, 19). Globally, 40% of people bitten by suspected rabid animals are children under 15 years of age (19). This is just one amongst reported cases of dog bites incidence throughout Sierra Leone which have been confirmed positive for rabies.

## TAKE HOME MESSAGES

- Younger children have a higher likelihood of dog bites and therefore a higher risk of exposure to rabies.
- Dog bite incidence that the incriminated dog heads are confirmed rabies positive is alarming in Sierra Leone
- Awareness raising on responsible dog ownership and vaccination of dogs is urgent

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