

Human Exposure to Dog Rabies in Rural Africa

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Abstract

Rabies is a fatal disease of mammals, including man, caused by rabies virus. It is usually transmitted via saliva of infected animals, especially dogs. Human exposure to dog rabies occurred on January 1, 2015 involving a 60 year old woman who received first aid treatment and post exposure prophylaxis, but survived exposure to the deadly virus without immunoglobulin.

Keywords: Rabies; Domestic dog; Human exposure; First aid treatment; Post-exposure prophylaxis

Introduction

Rabies is a fatal zoonotic disease affecting mammals, including humans [1]. Although 100% preventable by achieving at least 70% dog vaccination coverage, supplemented by availability of human vaccines, effective collaboration between stakeholders and effective reporting system [2], rabies is responsible for more than 55, 000 human deaths annually world-wide [3]. It causes over 24,000 deaths a year in Africa, killing a patient, most often a child, every 20 minutes, mostly in poor rural communities [4-6]. Domestic dogs are known to account for majority of human rabies exposure and mortalities cases in Asia and Africa [7]. Diagnosis of rabies is achieved by detection of the antigen in brain smear using the direct fluorescent antibody (DFAT) [8]. Pre-exposure Vaccination is the most effective method of preventing rabies infection [9]. Once exposure occurs, management constitutes immediate wound cleansing and post-exposure prophylaxis (PEP) which involves local infiltration of rabies immunoglobulin around and in the site of bite and parenteral administration of rabies cell culture vaccines in multiple doses [10].

Case Description

In many parts of the world, including Nigeria, January 1st of every year is a day of the New Year celebrations. On January 1st, 2015, when friends, relatives, neighbours and well-wishers were busy visiting and celebrating the season from house to house in a rural community of central Nigeria in Africa, a domestic dog emerged from its hand-out in the owner's compound and snapped at the tip of the ring finger of a 60 year old woman who was among the several visitors to that compound (Figure 1). The bite victim was taken to the Staff Clinic of a Government



Figure 1: Dog bite victim was presenting bite wound shortly after first aid treatment.



Figure 2: The dog head presented was being processed for rabies diagnosis.

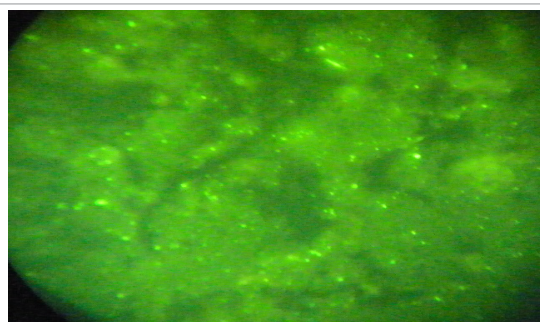


Figure 3: Rabies virus antigen fluorescing in the dog's brain tissue smear.

Institution in the vicinity for medical intervention while the dog was killed by members of the community and the head presented for rabies diagnosis (Figure 2) at the National Rabies Laboratory situated about 5 km away, on the same day.

While necessary first aid treatment was being given to the victim, the diagnosis result came out and was positive for rabies by DFAT (Figure 3).

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Based on the result, the first shot of rabies PEP was administered to the victim. Second, third, fourth and fifth doses of the PEP were given 3, 7, 14 and 28 days post exposure, respectively, in accordance with the WHO recommendation (WHO, 2010). However, rabies immunoglobulin was not included in the PEP due to its non-availability.

Discussion

Rabies is endemic in every geographical zones of Nigeria and an estimated 10, 000 human rabies cases occur annually (Nawathe, 1980). However, current records of human cases of rabies are not easily available due to poor monitoring and under reporting [11].

The immediate conveyance of the dog bite victim to the health centre for medical intervention and shipment of the head of the killed dog reveals some level of awareness on the part of the community on what to do when there is human exposure to rabies suspect animal. Where there is none or low level of awareness, unfounded traditional treatments is resorted to or nothing is done at all, putting the life of victim in danger of rabies infection.

Since 2009, FAT, the gold standard technique for rabies diagnosis is employed at the rabies national laboratory, Nigeria [12,13]. This has reduced the likelihood of wrong or miss-diagnosis and the risk of infection in exposed humans. First aid and the initial dose of the rabies vaccine were administered to the victim at the clinic, but without rabies immunoglobulin. In most tertiary, secondary and few primary health facilities in Nigeria, rabies cell culture vaccines for human use are obtainable at the cost range of ₦ 1,700 to ₦ 3,000 (\$8.09 to \$14.28) per vial as at the time of this report. This amounts to ₦ 8, 500 to ₦ 15, 000 (\$40.45 to \$71.40) for the 5 rounds of the vaccination regimen. The cost of this medication is not easily affordable by most poor rural dwellers [13] living below \$1 per day. Although rabies immunoglobulin was not included in the PEP because it was not available in Nigeria at the time of this report, the victim survived the exposure to the deadly virus. In summary, good level of awareness on rabies in the community, availability of rabies vaccine and close proximity to standard diagnostic facility has prevented the deadly rabies infection from occurring [14].

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