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Case Report

Late-Onset Rabies: A Case Report Highlighting the Importance of Prompt Medical Attention

Obiefuna AG [1], Okafor MT [2,*], Nwosu NI [1], Nlewedim PA [1], Obodo OI [3], Ejim EC [1], Onyedum CC [1], Chukwuka JC [1]

[1] Department of Internal Medicine, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Enugu State, Nigeria

[2] Department of Pharmacology and Therapeutics, College of Medicine, University of Nigeria, Nigeria

[3] Department of Hematology, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, Enugu State, Nigeria

*Correspondence: Dr Okafor Michael Tochukwu (michael.okafor@unn.edu.ng)

Abstract: Rabies is a virus present in more than 150 nations and territories worldwide, but it can be prevented through vaccination. Each year, tens of thousands of people die from rabies, primarily in Asia and Africa, with children under the age of 15 representing 40% of these fatalities. Up to 99% of rabies transmissions to humans occur through dog bites, making dogs the leading cause of rabies-related deaths in humans. We present a fatal case of rabies after a 5-month exposure incident. The patient, a 55-year-old Nigerian missionary from Enugu state, Nigeria presented with restlessness, hydrophobia, occasional barking gestures, abdominal discomfort and agitation. His condition was said to have progressively worsened as patients was unable to eat and drink fluids for days. His wife reported that the patient had experienced a bite from a stray dog on his right arm 5 months before presentation, for which no antirabies prophylaxis was given. The patient died on the second day of admission to the hospital (within 7 days of symptom onset).

Keywords: Post-Exposure Prophylaxis, Incubation Period, Late-Onset Rabies, Prompt Diagnosis

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1. Introduction

Rabies is a viral zoonotic disease caused by the lyssavirus, which also affects the central nervous system. More than 150 countries and territories are affected by rabies, a neglected tropical disease (NTD) that can be avoided by immunization [1]. Almost all rabies cases end in death once the disease's symptoms manifest. Although both domestic and wild animals can get rabies, domestic dogs are most often the primary means of human-to-rabies transmission [1]. The majority of rabies cases that are reported in the United States each year involve raccoons, bats, foxes, and skunks [1]. Saliva can spread the virus to humans and animals by bites, scratches, or direct contact with mucous membranes, including the eyes, mouth or open wounds.[1] Children between the ages of 5 and 14 years are frequent victims [1].

All continents except Antarctica are affected by rabies, and Asia and Africa account for more than 95% of all human fatalities. However, registered numbers of rabies cases are far lower than the expected burden, and cases are rarely reported [2]. Tens of thousands of people die from rabies every year, primarily in Asian and African nations, making it one of the deadliest zoonoses known to man [2]. It is predicted that tens of thousands of individuals worldwide pass away with rabies every year (95% CI: 25,000–159,000) [3]. Despite the availability of effective vaccines for both humans and animals, rabies is still thought to cause around 3.7 million years of lost life and $8.6 billion in

economic damages annually. In Nigeria, it is estimated that rabies kills thousands of people annually [3].

Nigeria carried out the last mass dog vaccination campaign in 1982 [3]. The high-risk groups include (i.e., children, butchers, and adult males)

Fortunately, dogs can be vaccinated against rabies, and the risk of dog bites can be minimised.

We report on a case of rabies in a 55-year-old Nigerian missionary and discuss the importance of more awareness of the need for rabies bite post-exposure prophylaxis and mass vaccination campaigns.

2. Case presentation

The patient, a 55-year-old Pentecostal missionary from Nigeria's Enugu state, had no co-morbidities. He has five children and was married. He was diagnosed with hypertensive heart disease and sent from St. Mary's Hospital to St. Patrick's Hospital in Enugu State. He had been exhibiting signs of restlessness, hydrophobia, anxiety, stomach pain, and sporadic barking for five days. Five months before the presentation, his wife disclosed that the patient had been bitten by a stray dog on his right arm. He also suffered from sporadic attacks of palpitations and respiratory difficulties. There were no other prodromal symptoms, including fever, sore throat, anorexia, malaise, or muscle weakness. No history of dysphagia, however, the patient's symptoms were noted to get worse whenever he drank water. He assumed he was suffering from malaria as it is endemic in Nigeria, so he took antimalaria. The following day he took antibiotics (Ciprofloxacin) to cover for possible Typhoid fever infection which is believed to be common. He also fasted and prayed but presented to the hospital as his symptoms persisted and got worse.

Examination findings on presentation revealed a middle-aged man who was conscious and alert, but he was also restless, afebrile, not pale, anicteric, acyanotic, and dehydrated. He also had no lymphadenopathy or leg oedema.

Kernig's sign was negative, and the neck was flexible. The pupils were responsive and of average size. He was able to actively move every limb. He had an admission blood pressure of 170/90 mmHg, a pulse rate of 110 beats per minute, and heart sounds 1 and 2. No murmurs were heard. There were vesicular breath sounds and no other sounds, and the respiratory rate was 28 cycles per minute. There was mild generalized abdominal tenderness and a scaphoid abdomen.

Investigation results revealed elevated blood urea of 15 mmol/l and hypernatremia (sodium was 160 mmol/l). Random blood sugar was 11.3 mmol/l, calcium was 1.87 mmol/l, and phosphorus was 1.84 mmol/l. All other serum electrolyte levels, including creatinine, were within normal limits. A complete blood count and blood smears revealed leukocytosis (mostly neutrophils) and hypochromic microcytic anaemia. Lactate dehydrogenase was 354 U/l, total protein was 58.7 g/l, and albumin was 16 g/l.

An evaluation for encephalitic rabies was conducted. Along with intravenous fluids and sedatives, the initial dose of the rabies vaccine was given. Following an unsuccessful resuscitation attempt, the patient passed away on the second day of admission due to cardiorespiratory failure. The patients' contacts, including his wife, were then counselled and given the opportunity to get vaccinated against rabies.

3. Discussion

Rabies is a neglected tropical illness that mostly affects vulnerable and impoverished groups; rabies-related deaths are frequently unreported [1]. Despite being completely preventable, rabies kills about 59,000 people annually in more than 150 countries, primarily in underdeveloped regions, because human vaccinations and immunoglobulin are not easily accessible [1]. Every dog bite case is regarded as a possible rabies case [1]. A history of dog bites followed by the characteristic symptoms of paralysis, anxiety,

agitation, profuse salivation, and hydrophobia is the basis for a confirmed case of rabies [1]. The patient described in this report fits the criteria for a rabies case. Although it can range from one week to a year, the incubation period for rabies is normally two to three months [1].

The incubation period for rabies can be long to the type of rabies virus, the viral load, the severity of the wound and the location of the exposure site (i.e., whether it's near the brain) [1,8]. Other factors include if the person has received anti-rabies vaccine and age of the patient (younger children may have shorter incubation period) [8].

Acute viral encephalomyelitis is a complication of rabies which may present as paralytic or furious rabies.

Signs of hyperactivity, excitable behaviour, hydrophobia, and even aerophobia are typical of furious rabies. After a few days, cardio-respiratory arrest results in death [1]. About 20% of human cases are paralytic rabies, which has a less dramatic and typically lengthier course than the furious variety. The bite or scratch location is where muscle paralysis first appears. Eventually, a coma develops, followed by death [1]. In Ghanaian research, 52.4% of cases reported symptoms starting about two months after exposure, with exposure and symptom onset times ranging from three weeks to four months [3]. The patient described in this report had a history of a dog bite around five months before the onset of symptoms. This corresponds to the one-week to one-year incubation time that is usual for rabies [3].

A dog bite occurred almost five years before the development of symptoms in another study by Amoako YA et al.; this indicates a long incubation period, and they believed the informant's recollection bias had a role [3]. Alternatively, the virus might have been slowly replicating, establishing a latent infection after its initial exposure five years prior, and then reactivating the neurotropic virus infection in later years. Three patients in a different Bangladeshi investigation also reported incubation times longer than 1000 days, which they ascribed to recall bias and probably further exposures after the initial bite [5]. Although they are uncommon, long rabies incubation periods have been documented. In their report of a case of rabies encephalitis with a potential 25-year incubation period, Shankar and colleagues hypothesized that the disease's pathophysiology might have involved the reactivation of a latent infection [6].

More than half of the cases in a 25-month study conducted in a tertiary hospital in Ghana were older than 18 [4]. The most prevalent symptoms among that population were agitation and hydrophobia, and the case fatality rate was 100%, with about 60% of individuals dying within 24 hours of admission [4]. The longest stay lasted for five days. In keeping with the aggressive course of the illness, our patient experienced comparable symptoms and died within two days of being admitted to the hospital [4].

A positive rabies test result from an offending animal from the veterinary services is one factor used to make the clinical diagnosis of human rabies [1]. Some of the preventative and control strategies in Nigeria include enhancing the rabies vaccination of canines and offering pre- and post-exposure vaccinations for humans [7].

Other causes of central nervous infections (including bacterial, fungal, and other viruses and abscesses) and intracranial tumours are some differential diagnoses that should be considered. Since the patient had a history of dog bites and the typical signs of rabies infection, these aetiologies were not investigated [1]. When rabies-specific signs, like hydrophobia or aerophobia, are evident, a clinical diagnosis of rabies is frequently made [1]. By identifying viral antigens, the whole virus, or nucleic acids in infected tissues (saliva, urine, brain, or skin) using a variety of methods, human rabies can be verified both during the clinical disease stage and after death [1].

In Nigeria, rabies is still a top-priority zoonotic disease, although it has gotten very little attention from the human and animal health sectors [7]. Only 998 human and 273 dog-suspect rabies cases were reported nationwide between 2017 and 2022, making it grossly underreported [7]. Additionally, visiting prayer houses and pre-treating rabies

infections with herbal mixtures increase the risk of rabies death in Nigeria. Using the "One Health Approach" to combat the scourge of a zoonosis like rabies necessitates a cooperative and interdisciplinary effort that transcends the borders of environmental, human, and animal health to conduct risk assessments and create response and control plans [9].

To achieve the global goal of eliminating human deaths caused by dog-mediated rabies by 2030, a proactive approach was adopted in 2015 [10]. The World Health Organization (WHO), the World Organization for Animal Health, the Food and Agriculture Organization of the United Nations (FAO), and the Global Alliance for Rabies Control (GARC) have established a global multi-sectoral partnership called "United Against Rabies" to provide a common plan for reaching this goal [10].

In Nigeria, rabies is endemic, and the country has a very poor rabies control plan, scoring just 1.5 out of 5 on the Stepwise Approach towards Rabies Elimination (SARE) [7].

4. Recommendation

Mass dog vaccination, enhanced monitoring, and improved access to Pre-exposure Prophylaxis (PrE) and Post-exposure Prophylaxis (PEP) for at-risk groups are essential components of rabies prevention and control [1,7]. Responsible dog ownership enforcement and public education also play critical roles in this effort. Since the first recorded case of rabies in Nigeria in 1912, the disease has continued to affect both humans and animals [7]. Unfortunately, severe underreporting has hindered effective action due to weak healthcare infrastructure, inadequate reporting methods, and the misdiagnosis of neurological disorders, which is often complicated by sociocultural practices. As a result, there is a lack of concrete evidence to support prioritizing rabies prevention, as outlined in the global target for 2030 [7].

Additionally, to achieve the minimum 70% vaccine coverage suggested by the World Health Organization (WHO), mandatory dog vaccination and the establishment of a national rabies program are required [7]. Furthermore, funding for pathogen discovery is required to improve laboratory-based surveillance for wildlife rabies, comprehend its possible significance in Nigeria, and conduct quantitative research to identify the different risk factors for the disease's persistence [7].

5. Conclusion

The incubation period of rabies is highly variable so patients may only present with symptoms long after the exposure incident. Awareness of the importance of post-prophylaxis anti-rabies vaccine should be created also appropriate molecular testing tools, should be made easily accessible as these are vital in confirming cases of rabies.

Given that the incubation period varies greatly, it is advised to have a high index of suspicion for rabies in individuals with encephalopathy. Since there is now no effective treatment for rabies, raising public awareness of the disease and offering suitable post-exposure prophylaxis is necessary to lower the incidence of rabies in humans and its mortality. Nigeria must re-strategize its current rabies control program to achieve zero by 2030. This can be achieved by funding and implementing the national strategic plan for rabies control, setting up a rabies desk in each of the 36 states, conducting rigorous mass vaccination campaigns, offering post-exposure prophylaxis, and prioritizing mass enlightenment with an emphasis on responsible pet ownership.

Conflict of interest statement

The authors declare no conflict of interests

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