CASE REPORT

Rabies Encephalopathy in a Pediatric Patient: A Case Report and Recommendations for Community Engagement in Prevention Strategies in Ondo, Nigeria

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ABSTRACT

Rabies is a fatal viral disease affecting the central nervous system. It is transmitted through the saliva of infected mammals, usually via bites, causing confusion, paralysis, and hydrophobia. It is a preventable viral disease that remains a significant public health challenge, especially in developing countries like Nigeria. Prevention is done with immediate wound washing and post-exposure vaccines. Dogs and bats are major vectors globally. We present a case of a 5-year-old female patient diagnosed with rabies encephalopathy following a dog bite. Despite management efforts, including intravenous antibiotics and supportive care, the patient deteriorated and was declared deceased approximately 15 hours post-admission.

Keywords: Community awareness, Dog bite, Nigeria, Post-exposure prophylaxis, Rabies, Rabies encephalopathy.

INTRODUCTION

Rabies is an acute viral infection caused by the rabies virus, a member of the Lyssavirus genus in the Rhabdoviridae family[1]. It is primarily transmitted through the bites of infected animals, particularly dogs, which are the main reservoirs of the virus in many regions, including Nigeria[1]. Despite being preventable through timely post-exposure prophylaxis (PEP), rabies continues to be a significant public health challenge, particularly in developing countries where awareness and access to effective treatment remain inadequate[2].

Rabies is not only a zoonotic disease of significant concern but also a formidable challenge for public health infrastructures in low-income settings[3]. Epidemiological studies have highlighted the need for vaccination of both stray and pet animals as a critical component of rabies prevention[4]. Furthermore, studies emphasize that community education regarding the risks of rabies and the necessary steps to take after animal bites is imperative in reducing occurrences of post-exposure deaths[3].

In Nigeria, rabies is endemic, with the World Health Organization (WHO) estimating that over 1,000 fatalities occur annually due to the disease[4]. The burden of rabies in children is particularly concerning; many cases are linked to dog bites that happen during play or while traveling in rural areas[5]. One of the disheartening aspects of rabies is that clinical signs may not appear until weeks or months after infection, often culminating in neurological symptoms such as seizures, visual disturbances, and altered consciousness as observed in rabies encephalopathy[6].

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The diagnostic dilemma surrounding rabies necessitates a high index of suspicion, particularly in patients with a clear history of exposure[7]. Clinical manifestations typically arise from central nervous system involvement, leading to severe conditions such as hydrophobia due to laryngeal spasms, autonomic dysregulation, and ultimately, coma and death[6]. The case of a 5-year-old girl presented here underscores the necessity for immediate medical attention following an animal bite and the dire consequences that can result from delays in receiving PEP.

The recommendations for rabies management involve swift administration of post-exposure rabies vaccination, wound cleaning, and, in high-risk cases, rabies immunoglobulin (RabIg)[8]. A failure to initiate appropriate PEP can lead to catastrophic outcomes, as illustrated in this case report, where rabies encephalopathy progressed rapidly after a history of dog bite without timely intervention.

Public health policies focusing on rabies prevention must include initiatives aimed at increasing awareness of rabies vaccination for pets and educational programs regarding immediate first-aid measures after animal bites[9]. In Nigeria, challenges such as limited healthcare access, lack of proper post-exposure vaccination facilities, and misinformed perceptions about rabies significantly contribute to the persistence of the disease[10]. Initiatives from both governmental and non-governmental organizations are vital in fostering community engagement and building resilience against rabies transmission[7].

Finally, while rabies is nearly always fatal once clinical symptoms appear, rabies vaccination after exposure remains highly effective if administered promptly[11]. This reinforces the critical need for education on the importance of PEP and the implementation of preventive measures to mitigate the impact of rabies in endemic regions[13].

This research aimed to provide a comprehensive account of the clinical presentation, management, and outcome of a 5-year-old female patient diagnosed with rabies encephalopathy following a dog bite, emphasizing key symptoms such as altered consciousness and feeding refusal. To critically assess the deficiencies in PEP, specifically the lack of rabies immunoglobulin administration, highlighting the importance of timely intervention in suspected rabies cases. To evaluate the current level of community awareness regarding rabies prevention, symptoms, and the urgent need for seeking medical care following animal bites. To develop and propose actionable recommendations targeting community education, vaccination of domestic animals, and promotion of healthcare access to mitigate the incidence of rabies infections in Ondo, Nigeria. To advocate for the integration of rabies management into regional public health policies, fostering a multi-sectoral approach to rabies prevention and control in Nigeria.

CASE PRESENTATION

A 5-year-old girl was referred for specialists' care in our facility; Paediatrics Department, University of Medical Sciences Teaching Hospital (UNIMEDTH) Ondo with a 4-day history of refusal to feed and altered consciousness. Clinical examination revealed symptoms of drooling, difficulty swallowing, and seizures. The patient's history included a dog bite one month prior to presentation, after which the dog was killed, and she received only intramuscular tetanus toxoid without anti-rabies immunoglobulin or rabies vaccination. Upon examination, the patient was found unconscious with stable vital signs; heart rate of 126 beats per minute, respiratory rate of 22 breaths per minute, and oxygen saturation of 97% (on intranasal oxygen). The child was not pale, anicteric, and exhibited no pedal edema. Laboratory tests were initiated, including FBC, E/U/Cr, serology, and rabies hemoglobin titre. Intravenous Rocephin was administered 500mg 12hourly, and the child was placed on intravenous fluids (IVF) normal saline alternate with 5% dextrose in water at 10 drops per minute. Intravenous diazepam 5mg into alternate 500mls of IVF and 2.5mg PRN were administered due to persistent episodes of seizure. Personal protective equipment was employed for all caregivers. The child's relatives were counseled regarding the diagnosis, prognosis, and potential outcomes. Tragically, approximately 15 hours after presentation, the patient ceased all respiratory efforts. Resuscitation efforts were unsuccessful. An

assessment of suspected rabies encephalopathy was made. Despite management efforts, including intravenous antibiotics and supportive care, the patient deteriorated and was declared deceased approximately 15 hours post-admission. The cause of death was determined to be rabies encephalopathy.

DISCUSSION

The presented case of a 5-year-old female who succumbed to rabies encephalopathy serves as a somber reminder of the consequences of inadequate post-exposure management in rabies cases. Rabies, an entirely preventable zoonotic disease, remains one of the leading causes of viral encephalitis worldwide[13]. The United Nations recognizes rabies as a significant public health challenge in developing countries, particularly in Africa and Asia, where health system limitations hinder timely intervention[12].

Rabies typically manifests with neurological symptoms after an incubation period, with the progression being rapid once clinical signs emerge[13]. In line with existing research, the case showcased a classic evolution of rabies, where the patient reported drooling, swallowing difficulties, and altered mental state after a known exposure[14]. The absence of anti-rabies immunoglobulin and rabies vaccination, both pivotal in the post-exposure protocol contributed significantly to the fatal outcome[15]. This aligns with findings from studies indicating that prompt administration of rabies PEP, which includes rabies vaccine and immunoglobulin, can reduce mortality to nearly zero[16].

In Nigeria, rabies predominantly spreads through bites from infected domestic dogs, with children being particularly vulnerable due to their outdoor play[17]. The increased incidence of dog bites and subsequent rabies cases, as noted in this report, underscores the urgent need for educational campaigns focused on responsible pet ownership, proper wound care, and recognition of rabies symptoms. Studies show that improving community awareness about rabies significantly reduces the incidence of human cases[18]. Further, a lack of understanding about the disease and misperceptions regarding vaccination can lead to delays in seeking appropriate care[19].

In the presented case, the referral and management of the patient were affected by broader systemic issues within Nigeria's healthcare infrastructure. Delays in accessing PEP, compounded by limited availability of rabies vaccines and immunoglobulins in rural areas, create a public health crisis[20]. Moreover, the lack of a robust rabies surveillance system has contributed to the under-reporting of cases, making it challenging to implement effective preventive measures[21]. This case also highlights the significant socio-economic barriers that exist in developing nations, where families may lack the funds or means to obtain necessary post-exposure care[22]. As such, public health initiatives must not only focus on improving access to vaccines but also on enhancing community education and promoting affordable healthcare solutions[23].

Limitations

Post mortem examination was not done on this patient; it would have enabled gross and histological examinations of the brain in order to establish definitive diagnosis of encephalopathy. The child was planned to be moved to the intensive care unit for close monitoring but ventilator was not available; this would have improved the outcome in this child.

CONCLUSION

The tragic outcome of this case reflects not only the virulence of rabies but the multifaceted challenges faced in managing such a preventable disease within Nigeria. Strengthening public health responses through community education, better access to rabies treatment, and comprehensive vaccination strategies remains vital to prevent future rabies-related fatalities.

Our findings have further re-emphasized the necessity for improved public health initiatives aimed at educating the populace about the risks of rabies, the importance of vaccination, and prompt medical intervention following animal bites.

Recommendations

To mitigate the burden of rabies infections in Nigeria, several strategies are paramount. First, fostering effective community education programs

can improve knowledge about rabies and the urgency of seeking immediate medical attention post-exposure. Second, implementing regular vaccination campaigns for both domestic and stray dog populations is essential in reducing transmission risks. Additionally, collaboration among healthcare providers, governmental bodies, and non-governmental organizations is critical to enhance the availability of rabies vaccines and immunoglobulins across healthcare facilities. Establishing a comprehensive rabies control program that focuses on surveillance, education, vaccination, and patient care protocols is essential for effectively managing rabies risks.

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

This study was approved by the research committee of the Department of Paediatrics & Child Health, UNIMEDTH, Ondo, where this patient was managed.

Statement of informed consent

The authors certify that they have obtained appropriate patient consent forms for the data to be published.

Guarantor

The corresponding author will act as the guarantor for this manuscript.

Disclaimer (Artificial Intelligence)

We hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of manuscripts.

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