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Case Study

Rabies Death after Complete Post-exposure Prophylaxis

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I N F O

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A B S T R A C T

Rabies remains an important public health problem in developing countries. It is almost 100% preventable if proper wound care is done along with vaccine and immunoglobulin administration. We describe a case of rabies death that occurred following a rabid dog bite and full post-exposure prophylaxis. Even through rabies death with complete post-exposure prophylaxis is extremely rare, isolated occurrences are unfortunately still happening. Despite advances in research, there is currently no cure for this deadly disease.

Keywords: Rabies, Immunoglobulin, Vaccine Failure, Monoclonal Antibody

Introduction

Rabies is a zoonotic disease which causes acute viral encephalomyelitis and has a case fatality of nearly 100%. The rabies virus belongs to the Lyssavirus genus of the Rhabdoviridae family. Any mammal can transmit rabies, but dogs are the main reservoir species. 99% of human rabies deaths are caused by bite from dogs.[1] The most common way that rabies is transmitted to people is by the bite of a rabid animal or through the contamination of scratch wounds with virus-infected saliva. Post inoculation, the virus reproduces in the striated or connective tissue at the inoculation site before travelling to the neuromuscular junction and entering the peripheral nerves. The rabies virus will then advance retrogradely through the axons to the spinal cord and eventually the brain.[2,3] Even though there is no treatment for established rabies, it can be prevented by proper wound care and prompt administration of post-exposure prophylaxis.

Case Report

A 19-year-old immunocompetent girl had an unprovoked bite from her neighbour's dog on 30/5/2022 while going to school. She suffered a lacerated wound on her left hand in the web space between the middle and index fingers due to the bite (Figure 1). The wound was washed under running tap water immediately at a nearby house. She was taken to the district hospital in the proximity, and the intradermal rabies vaccine (purified Vero cell rabies vaccine) was taken within one and a half hours of the bite. She was then referred to a tertiary care hospital for administration of immunoglobulin. Within seven hours of the bite, the maximum amount of the 40 IU/kg (5.7ml) Equine Rabies Immunoglobulin (ERIG) was infiltrated around the area of the wound, and the remaining dose was administered intramuscularly at a different site. On days 3, 7, and 28, she received all of her intradermal rabies vaccinations (IDRV) from the nearby hospitals.

Figure 1.Dog bite wound

On day 28 of being bitten, she developed a fever. She received symptomatic care for the subsequent two days. On day 30 she developed hydrophobia and was promptly referred to a higher centre. But she succumbed to her illness within 24 hours of being admitted to the hospital.

Discussion

Rabies death after complete post-exposure prophylaxis following the WHO protocol is extremely rare. Most of the post-exposure prophylaxis failures are due to deviation from the WHO treatment recommendations.[4] There are case reports of rabies deaths in patients who were administered at least three doses of vaccine but not immunoglobulin.[5] There were also treatment failures in cases where early suturing of the wound was done, immunoglobulin was not administered to all the wound sites, and immunoglobulin was administered only intramuscularly and not at wound site. The only method that has completely protected against disease is pre-exposure immunisation followed by post-exposure boosting.[1]

Although WHO protocol for PEP was completely followed in this case, there could be many possible reasons for the death of the patient. There were multiple small wounds in and around the main wound. There is a possibility that all the small wounds may not be infiltrated with immunoglobulin in this case. There have been accounts of rabies deaths in which immunoglobulin had not been injected into every site.[6] The hand is a highly innervated area. The rabies virus can reach the central nervous system quickly from highly innervated areas. There was also a delay of 6 hours for the administration of immunoglobulin, after the IDRV was administered due to the non-availability of RIG at the district hospital. But it is not mentioned in any guidelines as to how early the immunoglobulin has to be administered. Failure to store the vaccine at an adequate temperature is another reason for vaccine failure. But in this instance, the hospitals where the vaccination was given scrupulously followed cold storage procedures. There is also a possibility of rabies strains which are resistant to the currently available immunoglobulin. Further studies are required in this field.

Rabies immunoglobulin is not easily available in many parts of the country. The problem of immunoglobulin shortage can be tackled to an extent by the usage of monoclonal antibodies (mAbs). The advantages of mAbs over immunoglobulins are improved safety, lower dose, longer shelf life, ease of administration, lower production cost, ability for large-scale production, and consistency in product. Currently two monoclonal antibodies are approved for usage in India, Rabishield and Twinrab. Both these products have analogous results in post-exposure prophylaxis when compared to RIG. However, additional research is still needed to determine the precise amount of mAbs needed for passive vaccination in the context of PEP.[3]

Conclusion

Rabies post-exposure prophylaxis is almost always effective if administered properly, but it doesn't ensure 100% mortality benefit. Rabies vaccine and immunoglobulin should be made freely and easily available throughout the country. Measures should be taken to vaccinate the domestic and street dogs who are the main carriers of the virus.

Value to scientific research

This case report contributes to the body of scientific research by documenting a rare instance of rabies mortality despite adherence to complete post-exposure prophylaxis (PEP). It highlights potential limitations or failures in current PEP protocols, raises questions about vaccine efficacy, immune response variability, or viral strain characteristics, and underscores the need for further investigation into optimising rabies prevention strategies. This case provides critical insights for clinicians, public health officials, and researchers aiming to enhance rabies management and reduce mortality.

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References

1. Warrell MJ, Warrell DA. Rabies: the clinical features, management and prevention of the classic zoonosis. Clinical Medicine. 2015 Feb 1;15(1):78-81. [Google Scholar] [Pubmed]
2. Yousaf MZ, Qasim M, Zia S, Rehman Khan MU, Ashfaq UA, Khan S. Rabies molecular virology, diagnosis, prevention and treatment. Virology journal. 2012 Feb

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21;9(1):50. [Google Scholar]
3. de Melo GD, Hellert J, Gupta R, Corti D, Bourhy H. Monoclonal antibodies against rabies: current uses in prophylaxis and in therapy. Current Opinion in Virology. 2022 Apr 1;53:101204. [Google Scholar] [Pubmed]
4. Wilde H. Failures of post-exposure rabies prophylaxis. Vaccine. 2007 Nov 1;25(44):7605-9. [Google Scholar] [Pubmed]
5. Kumar SK, Gupta P, Panda PK. Death from rabies: The reason being poor compliance to vaccination or it's failure. Journal of Family Medicine and Primary Care. 2020 Aug 1;9(8):4437-40. [Google Scholar] [Pubmed]
6. Deshmukh DG, Damle AS, Bajaj JK, Bhakre JB, Patil NS. Fatal rabies despite post-exposure prophylaxis. [Google Scholar] [Pubmed]

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