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Case Report

Bitten by a Rabid Bandicoot: Exposure to a Rare Naturally Rabies Virus-Infected Rodent

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Abstract

Rabies is invariably a fatal zoonotic disease. Any mammal can be infected with rabies, but natural infections in rodents are not usually reported.

Here, we describe a case report of a patient who was bitten by a bandicoot rat. Subsequently, the bandicoot was positive for rabies virus infection by laboratory investigations.

Any exposure to mammals should be assessed for risk of acquiring rabies and prompt post exposure prophylaxis therapy (PEP) should be administered. Continues rabies virus infection surveillance among humans and animals are recommended to achieve zero human deaths due to rabies.

Keywords: Rabies, post-exposure, bandicoot, rodent, *Bandicota*

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Introduction

Rabies is invariably a fatal disease, and most cases are reported from South Asia and Africa [1].

Any mammal can be infected with the rabies virus, and humans get infected due to bites, scratches or contamination of mucous membranes by saliva of an infected animal. More than 90% of human exposures are due to dogs, followed by cats and other wild mammals [1].

Bandicoots belong to the rodent family and can be infected with rabies virus [2,3]. But natural infections are extremely rare, and they are not considered an efficient host for rabies virus infection [4].

Case presentation

An elderly female presented to a general hospital with a history of a bite by a rodent on her right leg, near her ankle. The incident happened at night, just outside her house, and her husband noticed that the rodent was behaving aggressively. They trapped the rodent in a container and found it dead a few hours later.

Bleeding was noticed, and the wound was washed with running water for 5 minutes by the victim.

The dead animal was submitted to the National Rabies Laboratory for detection of rabies virus infection.

At the general hospital, exposure was evaluated by the medical team. There was a bite wound on the right leg near the ankle area, and exposure was categorised as major according to local rabies post-exposure prophylaxis (PEP) guidelines [5]. The patient did not

have any comorbidities and had no evidence of immunosuppression. Anti-rabies (ARV) vaccine modified 4-site intradermal (ID) schedule was started. Although this was a major exposure, the decision was based on the low risk of rabies in rodents and the pending laboratory report.

Laboratory diagnosis of rabies in the rodent

At the rabies diagnostic reference laboratory, the rodent was identified as a bandicoot rat based on its length (around 30cm without the tail), brown-black coat, and blunted snout. A photograph of the animal was referred to a zoologist and the identity of the rodent was confirmed as a *Bandicota* spp., *Bandicota indica* (Figure 1). (Figure 1) and the animal's brain was subjected to a fluorescent antibody test (FAT) at the rabies diagnostic reference laboratory, using a commercial monoclonal anti-rabies antibody-FITC conjugate according to the manufacturer's instructions (Fujirebio Diagnostics, USA) [6]. FAT results indicated positive for rabies virus antigen and were subsequently subjected to real-time RT-PCR (Figure 2) according to a locally validated protocol described by Mani et al., 2014, which confirmed the presence of rabies virus RNA in the bandicoot brain tissue sample [7].



Figure 1: Photograph of the dead bandicoot (kindly provided by the patient's husband)

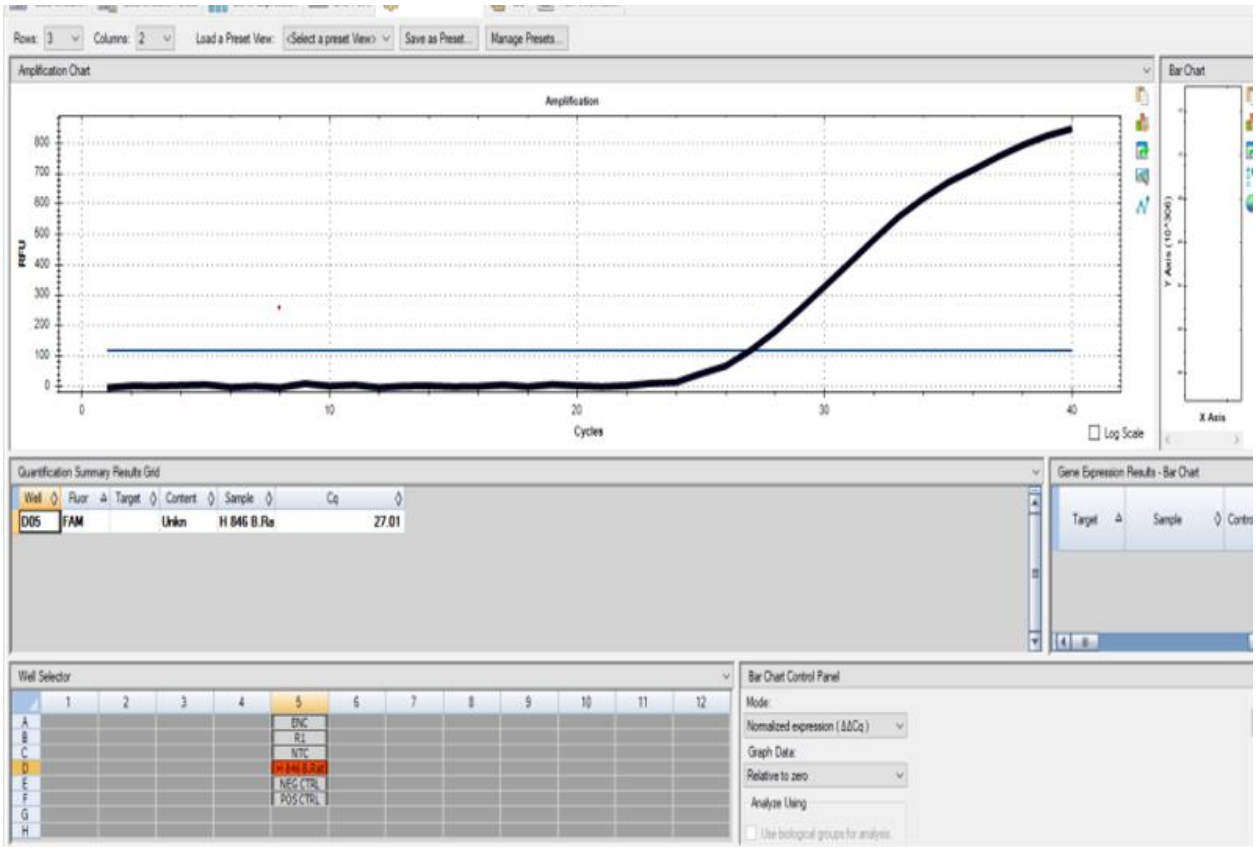


Figure 2: Amplification curve of the real-time PCR for bandicoot brain tissue sample

Therapeutic intervention

Anti-rabies Immunoglobulin (RIG) was infiltrated around the wound, and a fresh ARV ID course was started on day 3 of the exposure following advice given by the medical specialist in virology [5].

Timeline

The timeline of the case is given in Table 1.

Table 1: Timeline of the case

Day	Incident/ intervention
D0	Patient was bitten by the bandicoot Seek medical advice, considered as a major exposure but low risk of acquiring rabies Wound care given ARV modified 4 site ID schedule was started Advised submitting dead animal for diagnosis of rabies Dead animal was submitted to the laboratory for screening for rabies
D3	Animal brain was positive for rabies antigen by FAT (RIG) was infiltrated around the wound and a fresh ARV ID course was started
D4	Animal brain was tested for rabies virus RNA by RT-PCR Confirmed diagnosis Advised continuing full course of ARV

D - day

Patient outcome

The patient has completed the full course of ARV following ARS administration. Rabies PEP is 100% effective if initiated promptly and followed by completing the full course of ARV according to the prescribed schedule.

Discussion

Rabies is an endemic disease in Sri Lanka [8,9]. Sri Lanka has implemented a strategic plan to eliminate dog-mediated human deaths by 2030 on par with WHO goals [9]. However, around 15-25 deaths occur annually during the last five years despite the wide availability of PEP free of charge and dog rabies control measures. Few of those cases were due to wild animal or unknown exposures. To achieve this objective, health education among the public is important to encourage people to seek medical advice after any exposure to mammals. Controlling rabies virus transmission among dogs and cats is also important and will prevent spillover to other mammals. Rabies virus can infect any mammalian species, but data on natural infections in bandicoots and other rodents are scanty. The role of rodents as a natural host for rabies is often debatable [10]. Rabies virus infection was detected in rodent spp. like groundhogs (Marmota monax) and the North American beaver (Castor canadensis) in America [11]. Studies conducted in India and Thailand showed no evidence of rabies infection among wild-caught rats and bandicoots [12,13], but there was positivity in *Bandicota* spp. in Sri Lanka previously [8]. Many guidelines do not recommend PEP for domestic rat bites or scratches, but bandicoots are considered in most guidelines [4]. Spreading this infection to other mammals, which usually harbour the infection rarely, is a concern. Although cases of human rabies are getting reduced gradually, the virus is circulating among free-roaming dogs and pet dogs with a significant positivity rate [5]. Spillover is quite possible in this situation. This emphasises the need for continued rabies virus infection surveillance in the dog population and other mammals and further strengthening the dog vaccination and dog population management programs.

Conclusion

Any exposure to mammals should be assessed for risk of acquiring rabies, and prompt PEP should be administered. Although the majority of exposures were due to dogs and cats, health care workers and the general public should be vigilant about other exotic mammals as well. Continued disease surveillance among humans and animals is recommended to achieve zero human deaths by 2030.

Consent for publication: Informed written consent was obtained from the patient.

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Ethics: Not applicable. This study was conducted according to the Declaration of Helsinki on research involving humans and human data.

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Author contribution: RM wrote the initial draft, supervised the laboratory experiments, and provided expert advice on patient management. DC and DC conducted laboratory experiments and data curation.

VW has validated the laboratory investigations and provided expert advice on patient management.

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