



Case Report

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Fatal case of human rabies infection: A case report

Seyed Abbas Hosseinalipour¹, Faranak Firoozfar², Abedin Saghafipour^{3✉}, Nazanin Ziasheikholeslami⁴

¹Qom Provincial Health Center, Qom University of Medical Sciences, Qom, Iran

²Vector-borne Diseases Research Center, North Khorasan University of Medical Sciences, Bojnurd, Iran

³Department of Public Health, Faculty of Health, Qom University of Medical Sciences, Qom, Iran

⁴Department of Infectious Diseases, Faculty of Medicine, Qom University of Medical Sciences, Qom, Iran

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ABSTRACT

Rationale: Rabies, as an acute viral disease of the mammal's central nervous system (CNS), with a high mortality rate, is transmitted to humans through the bite of a rabid animals, especially canine and feline.

Patient concerns: An Afghan man, aged 50 years was bitten by a fox in a farm around the Qom-Tehran road, Central Iran in 2018. The patient visited the doctor after the bite, however the period between incidence and hospital visit was not established and no indication was given whether the bite site injury was thoroughly washed. The patient was neither referred to the health center for vaccination (post-exposure prophylaxis) nor an effective therapeutic measures was applied. Forty-five days post-exposure, the patient presented with symptoms such as headache, fever, tingling and burning sensation and was referred to the Centers for Disease Control and Prevention (CDC) unit of Qom Provincial Health Center.

Diagnosis: Rabies infection.

Interventions: Forty-five days after the animal bite, in CDC of Qom Health Center, he received rabies post-exposure prophylaxis treatment and was referred to an infectious diseases physician. Based on the history of animal bites, the patient was classified as probable case of rabies. The clinical symptoms of rabies appeared in patient after hospitalization.

Outcomes: Ultimately the patient died in hospital 4 days after hospitalization (50 days after the occurrence of animal bite). After referring the patient to the CDC, the patient's saliva (0.5-1 mL) was sampled three times every 3-6 hours and tested by PCR. Human rabies was confirmed by Department of Virology in the Pasteur Institute of Iran.

Lessons: Physicians and clinicians have responsibilities to be critical in observations and take prompt actions in case of animal bites, as rabies usually develops within 7 to 14 days, and delayed intervention after the onset of symptoms, vaccine and serum injections cannot lead to the survival of the patient.

✉Corresponding author: Abedin Saghafipour PhD, Department of Public Health, Faculty of Health, Qom University of Medical Sciences, Qom, Iran.
Tel: +98 (25) 37842224
Fax: (25) 37833361
E-mail: abed.saghafi@yahoo.com

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1. Introduction

Rabies is a zoonotic disease of mammal's central nervous system with a high mortality rate. This disease is transmitted to human through the bite of a rabid animals, especially canine and feline. Annually, more than 29 million people in the world take rabies post-exposure prophylaxis (PEP) following animal bites[1]. But, about 55 000 human rabies-related deaths are reported due to delayed or deferred rabies post exposure prophylaxis in the world yearly[2]. Based on previous studies in Iran, most of the animal bites are dog bites and happened in hands, arms and trunk (60%-70%), head and neck (15%-20%) and lower limbs (5%) of males with age group of 5-14 years[3]. According to the annual animal bites released by the Centers for Disease Control and Prevention (CDC) of Iran, 125 000 to 129 000 cases of animal bites are reported annually in Iran, and Qom province is one of the provinces with a high rate of animal bites (109 per 100 000 people) in the country[3]. Naturally, all warm-blooded mammalian animals can be reservoir of rabies virus, but the most common animal bites related to dogs, cats, wolves, foxes, jackals and other wild and domestic animals[4]. Fatal case of human rabies infection due to dog bites have been reported but deaths of human rabies-related to fox bites is quite rare[5]. The aim of the present study was to report a fatal case of human rabies infection related to fox bite (consent to publish the case report has been obtained from the legal surrogate).

2. Case report

The patient was a 50-year-old man with an Afghan nationality, he worked in a farm around the Qom-Tehran road in 2018; he was attacked by a fox which inflicted bite injuries to his head and palm of the left hand. The patient visited a general physician and reported hand bite injury. However, this patient was not referred to the health center in order to receive vaccine, and effective therapeutic measures. Forty-five days later, the patient developed symptoms such as headache, fever, tingling and burning sensations and was referred to the CDC unit of Qom Provincial Health Center. In CDC, he received PEP treatment and referred to an infectious diseases physician at governmental hospital under supervision Qom University of Medical Sciences. It should be declared that at the onset the patient's admission, the wound was not visible at the site of the bite. According to a history of animal bites (fox bite), the patient was classified as probable case of rabies by an infectious diseases physician. In the patient's history, there were no diabetes, cardiovascular, psychiatric and other chronic diseases such as high blood pressure and renal disorders. In the patient's tests, potassium loss (4.2 mmol/L) and acute hemolysis were reported, but

erythrocyte sedimentation rate (ESR=9 mm/h), urine and creatinine (0.9 mg/dL) analysis were normal and liver enzymes were slightly increased (AST=32 U/L, ALT=43 U/L). The clinical symptoms of rabies appeared in patients after hospitalization, then patient had restlessness, respiratory distress, defective words, roaming, seizures, emesis and then getting loss of consciousness, trismus, increased salivation and muscle paralysis. Therefore, sedative medications were prescribed. After that, symptoms such as inability to swallow, hydrophobia and photophobia were observed in the patient. The patient was then transferred to the Intensive Care Unit (ICU). After transferring to the ICU, patient's general condition was worsening and the patient suffered from cardiac and respiratory arrest. Ultimately the patient died in hospital after 4 days from hospitalization (almost 50 days after the occurrence of animal bite). After referring the patient to the CDC unit, the patient's saliva (0.5-1 mL) was sampled three times each 3-6 hours and tested by RT-PCR method and human rabies was confirmed by Department of Virology in the Pasteur Institute of Iran. It should be noted that informed consent (MUQ.1397) was obtained for publishing the data of the present case of fatal rabies.

The mortality of rabies in humans is very high; nearly 100%[6]. Hence, following the onset of clinical symptoms, treatment measure is not effective and death is almost unavoidable[6]. In the present case, approximately 45-day incubation period supervened following which clinical signs manifested. Based on an established PEP treatment protocol at the Pasteur Institute of Iran, one of the recommended measures for animal bites to reduce the likelihood of clinical rabies in humans is to wash the wound site for 15 to 20 minutes with soap and water[7]. In the present report, fox bite from head and palm of the left hand of the patient occurred. According to the history of patient and anecdotal information gathered, after the occurrence of animal bite, the patient did not wash the wound site with soap and water. Primary symptoms of rabies usually are fever, chills, fatigue, headache, weakness, anorexia, swallowing distress, nausea and vomiting. Some of these symptoms manifested but largely, the main symptoms of the current infection were burning and tingling sensation at the wound site. In this case, burning and tingling sensation at the wound site was the primary cause for referring the patient to the CDC unit. Patient with rabies, may predispose with acute nerve symptoms after the primary symptoms occur. Rabies has been observed to have two forms: the dumb rabies and the furious rabies. Furious rabies with symptoms of intense motor activity including running and kicking irritability and restlessness, illusion, anxiety, and hydrophobia. Increasing salivation and swallowing disturbances are symptoms of this form of rabies' disease[8].

In this report, patient had some primary symptoms such as restlessness, respiratory distress, defective words, roaming, seizures increased salivation and muscle paralysis. Furthermore, inability

to swallow, hydrophobia and photophobia were observed in the patient. Ultimately, the patient died four days after the onset of acute nervous symptoms. According to the report from the Pasteur Institute of Iran, 116 animal specimens (59.5%) were positive from 195 suspected specimens of rabies in Iran during 2015 alone. Out of positive specimens, dog bites were more than other animals' bites (39% of reported bites) and 6/8 of the total 116/195 positive were from Qom, as one of the high risk provinces[9]. In this present case, a rare case of fox bite happened leading to the death of the patient due to delayed intervention which rendered ineffective the treatment protocol. Previous studies in Iran have confirmed that mortality related to rabies usually occur due to non-referral or delayed referral to health centers after animal bites[10].

4. Conclusions

Qom Province in Central Iran remains a high risk focus for rabies, and physicians and clinicians should investigate in details cases of animal bite injuries. The approach of One Health wherein the veterinary and medical personnel as well as wildlife ecologists work together in rapidly resolving issues of animal bites will benefit planned intervention in Qom.

Conflict of interest statement

The authors declare that they have no conflicts of interest.

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Authors' contributions

S.A.H., A.S. and F.F. designed the report, S.A.H., A.S. and N.Z

collected data of the case study, A.S. and N.Z interpreted data. S.A.H., A.S., F.F. and N.Z contributed to manuscript preparation, manuscript editing and final approval of the manuscript.

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