Case Report

# Rabies can be a disease of puppyhood

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## Abstract

This brief report documents an interesting and a rare case of 10 week old male puppy who suddenly showed a change in his behavior (irritable, agitated, anorexic, and refusing feeds), bitten six humans, and was laboratory-confirmed as died due to rabies (Rapid antigen test and reverse transcriptase polymerase chain reaction positive for rabies at the National Rabies Reference Laboratory, WHO collaborating Centre for Rabies Epidemiology, Centre for Arboviral and Zoonotic Diseases, National Centre for Disease Control, Delhi). All animal bite victims were timely provided postexposure prophylaxis for rabies who had shown sufficient seroconversion by IgG antirabies antibody using enzyme linked immunoassay (ELISA) and have been reported healthy. This case report reinforces the role of veterinarians/primary care physicians for strong suspicion of rabies encephalitis in puppies with behavioral or neurologic abnormalities and timely/appropriate rabies immunization of the animal bite victims. Shreds of evidence also focus that rabies in puppies younger than 3 months of age is grave and the risk of human beings contracting rabies from young puppies is of public health importance because of fatal consequences. Continuing medical education for primary care physicians and veterinarians, and outreach community public awareness campaigns should be regularly done to promote knowledge of pre-exposure/post-exposure prophylaxis, preventive measures, and animal bite management.

**Keywords:** Post-exposure prophylaxis, pre-exposure prophylaxis, pup vaccination, rabies

Rabies is a vaccine-preventable and neglected tropical disease caused by the rabies virus. Rabies is nearly 100% fatal but preventable.[1] In the majority of cases, domesticated dogs are responsible for rabies virus transmission to humans.[2] It is spread to people and animals through bites or scratches, usually via saliva. The need for rabies pre-exposure prophylaxis should be emphasized by veterinarian/family physician to owners for their domestic dogs and self as pups are often unvaccinated when adopted/purchased. We report a case of 12-week-old domestic puppy that was confirmed to be dead due to Rabies at National Rabies Reference Laboratory, WHO collaborating Centre for Rabies Epidemiology, Centre for Arboviral and Zoonotic Diseases, National Centre for Disease Control, Delhi.

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## Case Report

A 1-day-old German Shepherd pup was purchased from a veterinary shop by the owner in Delhi without being vaccinated for rabies. The pup was healthy and undergoing training by the dog trainer. No record of the vaccination of bitch was known to the owner.

After 10 weeks (2 months 15 days), the puppy suddenly showed a change in his behavior (irritable, agitated, anorexic,



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and refusing feeds). It subsequently had bitten five family members unprovoked and the dog trainer. The pup was shown to the private veterinarian and was suspected to be suffering from rabies as its neurological signs worsened steadily leading to disorientation, in-coordination, and withdrawal over the next 10 days. No history of contact of the pup with any other dog/animal bite or unsupervised access to outside was reported by the owner. The pup died at age of 12 weeks. The primary care physician advised all the animal bite victims to take post-exposure prophylaxis (PEP) and undergo anti-rabies antibody estimation after completion of the course. The veterinarian sent a pup brain sample for the confirmation of rabies in our laboratory.

The sample was found to be positive by reverse transcriptase-polymerase chain reaction (RT-PCR) for rabies nucleocapsid gene (N gene) as per standard protocol used in our laboratory.[1] The rapid immunochromatographic rabies antigen test on brain tissues was found positive (Bionote, Republic of Korea). The anti-rabies antibody vaccination titer of family members after one month of completion of anti-rabies vaccination showed sufficient seroconversion (>0.05 IU/ml) by IgG anti-rabies antibody using Platellia™ Rabies II kit (Biorad, France).[3] Rabies laboratory of Centre for Arboviral & Zoonotic Diseases National Centre for Disease Control (NCDC) is a part of WHO collaborating Centre for Rabies Epidemiology and routinely provides referral diagnostic service for Rabies in animal bite victims/ suspected rabid dogs. This case report was a part of referral diagnostic service for Rabies provided by NCDC.

## Discussion

The case report presented suggests that the one-day-old healthy puppy bought by the owner was not vaccinated against rabies, and showed sudden neurological changes after 10 weeks and was found to be dead due to rabies (lab-confirmed) at age of 12 weeks.

As the pup was one day old when he was bought, with no history of animal bite as given by the owner and succumbed to death at 12 weeks, it is convincing to believe that the puppy was exposed to licks of non-vaccinated bitch which might be suffering from rabies as they lick their puppies immediately after birth to clean them and encourage them to breathe. Otherwise if the bitch of the affected puppy was vaccinated in our case, it was not able to feed the puppy and pass adequate maternal antibodies to puppy, thus the puppy succumbed to rabies when it had significant exposure.

Thus, we suggest that if bitches are not vaccinated/uncertain immune status, rabies vaccination for their pups may begin as early as 1 day of age.[4] Otherwise, if pups have protection due to maternal antibodies it is recommended that puppies should be given two anti-rabies vaccines (the first shot of rabies vaccination at 6-8 weeks and a booster at 3 months) in the first year of life with annual revaccinations.[5] Thus credence to the need for a change of the policy on dog vaccination is required against rabies in order to protect this age group of dogs.[6]

In our case, if timely and appropriate vaccination was not provided to the pet owner and family members/dog trainers the consequences could have been fatal. Primary care physician plays an important role in the timely management of the suspected rabies exposure in human and animal bite victims by indicating PEP and minimizing the risk.[7] Rabies is endemic in our country; therefore, specific vaccination guidelines/policies for dogs on their prevention from rabies may be formed and pet owners may either take rabies pre-exposure prophylaxis or post-exposure prophylaxis to prevent themselves in the event of the animal bite by their owned pet. Prevention/management of rabies can be possible by following the "One Health Approach", which involves inter-sectoral collaboration among animal, human, and environmental health sectors.[8]

Continuing medical education for primary care physicians and veterinarians, and outreach community public awareness campaigns should be regularly done to promote knowledge of pre-exposure/post-exposure prophylaxis, preventive measures, and animal bite management.

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## Conflicts of interest

There are no conflicts of interest.

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