

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

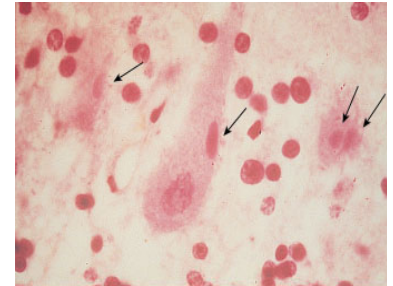
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Rabies

A 35 year old man was helping clean his neighbor's farmhouse when a colony of bats swarmed out from behind an old door. Unfortunately, one of the bats bit his arm before escaping. The man drove to the Emergency Department with his neighbor to get the wound checked out and cleaned. Upon Arrival to the ED, his vital signs were a blood pressure of 138/78 mm Hg, heart rate of 120 beats per minute, respiratory rate of 16 breaths per minute, pulse oximetry of 98% on room air, and a temperature of 98.5 degrees Fahrenheit. Inspection of the bite shows a deep bite mark on his left lateral upper extremity in the proximity of the deltoid muscle. What is the next step in his treatment?

- A. Irrigate the wound thoroughly with normal saline and administer the human rabies immunoglobulin into the wound and into the gluteal region.
- B. Irrigate the wound thoroughly with normal saline and administer the anti-rabies vaccine in three IM doses over a 28 day period.
- C. Irrigate the wound thoroughly with normal saline and observe the patient for ten days for symptomatic changes.
- D. Irrigate the wound thoroughly with normal saline, administer the anti-rabies vaccine in three IM doses over a 28 day period, and administer the human rabies immunoglobulin into the wound and the gluteal region.
- E. Irrigate the wound thoroughly with normal saline and prescribe a two week course of cephalexin.



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Negri Bodies are round or oval inclusion bodies seen in the Purkinje Cells of the cerebellum and the hippocampal neurons. They are pathognomonic for the disease.

Rabies is a devastating, deadly viral encephalitis contracted from a bite or scratch by an infected animal. The disease is more prevalent in developing countries where rabies vaccination of animals is not widespread. In the United States, infection is most commonly from bat, raccoon, and skunk bites. In developing countries, infection is most commonly from dog bites.

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

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Warriors

The correct answer is D. Irrigate the wound thoroughly with normal saline, administer the anti-rabies vaccine in three intra-muscular doses over a 28 day period, and administer the human rabies immunoglobulin directly into the wound and into the gluteal region.

Discussion

Rabies is caused by rhabdovirus, a bullet shaped, enveloped, negative sense RNA virus that has a helical nucleocapsid with glycoprotein spikes. It is transmitted via bites or scratches from an infected animal (infections in the United States are more commonly from bat, raccoon, and skunk bites while infections in developing countries are more commonly from dog bites). Aerosol transmission from bat caves is also possible, while an infection from a corneal transplant as also been documented. The disease is altogether more prevalent in developing countries where rabies vaccination of animals is not widespread.

Rapid animals might exhibit erratic and strange behavior, such as: biting without provocation; eating abnormal items such as sticks, nails, feces, etc; running for no apparent reason; vocal changes or an inability to produce sounds; or excessive salivation or foaming at the mouth.

The incubation period typically ranges from 30 to 90 days. Once symptoms are present, rabies is almost invariably fatal and treatment is supportive. The clinical features in a progressive order are as follows: pain at the site of the bite; prodromal symptoms of a sore throat, fatigue, headache, nausea and/or vomiting; encephalitis (confusion, combativeness, hyperactivity, fever, seizures); hydrophobia (inability to drink water due to laryngeal spasms with drinking); hypersalivation ("foaming at the mouth"); coma, then death. Some patients may present with ascending paralysis.



(via

<http://www.agriculture.gov.au/biosecurity/australia/naqs/naqs-target-lists/rabies>)

Treatment

If bitten by a suspected rabid animal, first clean the wound thoroughly. For wild animal bites (examples are a bat, skunk or raccoon), the animal should be captured if possible, euthanized, and sent to a laboratory for immunofluorescence of brain tissue. If a patient was bitten by a healthy dog or cat in an endemic area, the animal should be captured and observed for ten days. If there is no change in the animal's condition, then it most likely does not have rabies. For a known rabies exposure or if the wild animal is not available for testing, you administer active immunization and passive immunization.

Active immunization is the administration of the anti-rabies vaccine in three IM doses into the deltoid or thigh over a 28 day period. The vaccine is a killed/inactivated vaccine. Passive immunization is the administration of the human rabies immunoglobulin to the wound as well as into the gluteal region.

Treatment is typically initiated before the diagnosis is confirmed. Also, the tetanus vaccine should be administered if the patient has not received it in the last 5 years.

Pre-exposure prophylaxis, the rabies vaccine, is available for at-risk individuals such as veterinarians, wildlife officials, and laboratory workers.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and **click** on the **"Conference"** link.

All are welcome to attend!

Diagnosis

To date, there are no tests available to diagnose human rabies infection before the onset of clinical disease. The World Health Organization (WHO) defines a clinical case of rabies as a patient presenting with acute neurological symptoms progressing towards coma and death by cardiac or respiratory failure. It is recommended to confirm a clinical case of rabies with different laboratory techniques. The gold standard of diagnosis is a post-mortem fluorescent antibody detection of rabies virus antigen in infected tissues. The fluorescent antibody test (FAT) is recommended by the WHO in 95% of cases and gives reliable results on fresh specimens in a few hours. Also, Negri Bodies in the Purkinje cells of the hippocampus and cerebellum are pathognomonic for the disease.

Diagnosis of rabies during life is difficult and dependent on widespread dissemination of virus throughout the nervous system. The virus has been isolated in the saliva, detected with polymerase chain reaction (PCR), and cultured. In a non-immunized patient, you can check for rabies antibodies while in a previously immunized patient, you can check for rising serum antibodies over a few days (typically a four-fold increase).

Take Home Points

- In the United States, rabies is most commonly transmitted from a bite from a bat, raccoon, or skunk.
- If a bite from a rabid animal is suspected, irrigate the wound thoroughly, administer the rabies vaccine, and administer the anti-rabies immunoglobulin.
- Once symptomatic, rabies is unfortunately fatal and treatment is supportive measures.
- Gold standard for diagnosis is done by fluorescent tissue analysis for viral antigen post-mortem.

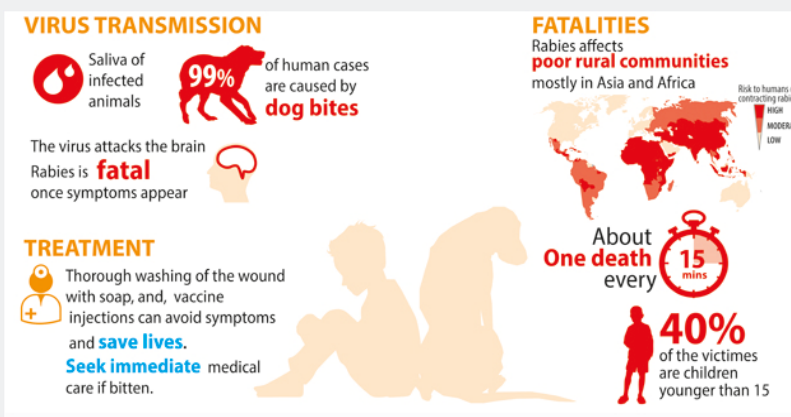


ABOUT THE AUTHOR

This month's case was written by Ashley Hall. Ashley is a 4th year medical student from NSU-COM. She did her emergency medicine rotation at BHMC in December 2018. Ashley plans on pursuing a career in Internal Medicine after graduation.

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Source: <https://www.who.int/features/2015/rabies-malawi/en/>