

What About Rabies?

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Rachael Fiske has nothing to disclose with regard to commercial relationships.



Rabies in the News...

Fox Suspected of Attacking 4
Otter That Attacked Maine Visitor Was
Biting Dog in
Rabid Groundhog Attacks Dog Near
Home Bitten, Now Needs Rabies Shots



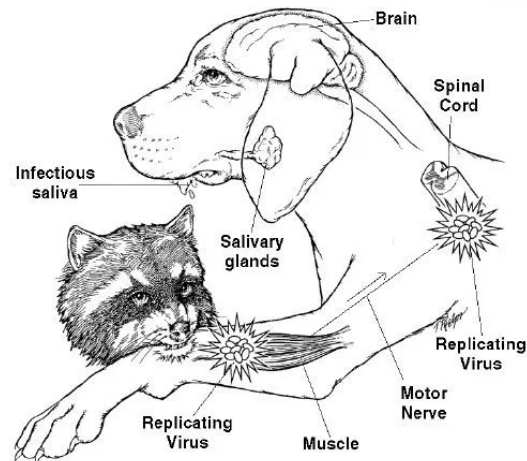
Overview

- Brief overview of rabies
- A couple of interesting/challenging case studies
- Challenges frequently encountered in Maine
- What Maine is doing about it and some new technologies on the horizon



Overview of Rabies Pathogenesis

- Transmission occurs when saliva containing rabies virus is introduced into a bite wound
 - Can also occur if saliva or central nervous system tissue from a rabid animal contacts a fresh wound or mucous membrane
- When rabies virus introduced into a wound or mucous membrane it multiplies at the site of inoculation then travels up peripheral nerves to the spinal cord, brain and then spreads from the brain to the salivary glands



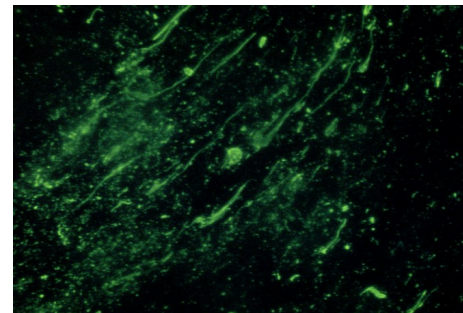
Overview of Rabies Pathogenesis

- Incubation period depends on viral strain, dose of virus, and site of bite (or non-bite exposure) among other factors
- Clinical signs (which vary widely in different species) occur when the rabies virus reaches the brain
- Infectious period - when the animal is shedding rabies virus in saliva and is capable of transmitting rabies – typically a few days before onset of clinical signs until death



Diagnosis

- Direct Fluorescent Antibody (DFA) testing is currently the only acceptable method of determining if the suspect animal has rabies
- All rabies testing in Maine is performed at the Health and Environmental Testing Laboratory (HETL) in Augusta
- Testing is done every day samples are submitted and any samples submitted before 9:00am will be tested the same business day



Case Study

- A bat was found in the bedroom of an 11 year old after she was sleeping but the bat wasn't immediately captured
- Other children in the house include a 4 year old and an 8 year old
- A bat was found dead in the house 2 days later and submitted for rabies testing

Result.....

Inconclusive



Discussion

- Who should receive Post-exposure Prophylaxis (PEP)?
- Ultimately, all three children received PEP



Case Study



- A neurologic horse, overdue for rabies vaccination, was euthanized and the brain submitted for rabies testing
- The horse resided in the backyard of an apartment complex and was frequently handled and fed treats by several residents
- 2 adults and 5 children were determined to be potentially exposed (non-bite exposures) as they had attempted to feed the horse after clinical signs were noted

Result...

Positive



Discussion

- PEP administered to 8 people total (7 received the full regimen – HRIG and rabies vaccinations, the veterinarian who euthanized the horse was previously vaccinated and received 2 boosters)
- Note: this case did NOT occur in Maine and the State and County Health Departments covered the cost of PEP for all individuals
- Would the recommendations be different in Maine?



Challenges in Maine

- Cost of post-exposure prophylaxis, cost of pre-exposure vaccination
 - Ensuring that those individuals who have been determined to have an exposure receive PEP
 - Ensuring that individuals at increased risk of rabies exposure (Vets, Vet techs, ACOs, shelter staff, wildlife rehabilitators, etc.) receive pre-exposure vaccination with regular titer checks
- Geography
 - Ensuring that animals that have exposed/potentially exposed a human or domestic animal are transported to HETL for testing



Potential Solutions to the Challenges

- Maine Veterinary Medical Association is now underwriting some of the cost of rabies vaccinations, boosters and titers for member veterinarians and veterinary technicians
- Low-dose intradermal vaccine series, suggested by the World Health Organization, will be used
- Hopefully this program will be used as a model for other “frequent risk” professions



Potential Solutions to the Challenges

State of Maine Rabies Working Group Mail-A-Bat Program

- Rabies testing submission forms, packaging and prepaid shipping labels distributed to veterinary clinics
- Guidance on humane, safe euthanasia of bats provided
- Constituents can drop a live or dead bat off at a participating vet clinic and it will be shipped to the HETL lab for testing
- Takes some of the strain off IF&W and ACOs and ensures that bats that should be tested get tested



New Technology on the Horizon

- LN34 is a PCR test that has been developed and is currently being gradually phased in around the country as well as internationally
- Detects tiny amounts of virus, and can be used in fresh, frozen, decomposed or even paraffin-fixed samples
- A likely use in Maine may be for “inconclusive” DFA results



Acknowledgments

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References

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Crystal M. Gigante, Lisa Dettinger, James W. Powell, Melanie Seiders, Rene Edgar Condori Condori, Richard Griesser, Kenneth Okogi, Maria Carlos, Kendra Pesko, Mike Breckenridge, Edson Michael M. Simon, Maria Yna Joyce V. Chu, April D. Davis, Yu Li, PLOS One, May 16, 2018, <https://doi.org/10.1371/journal.pone.0197074>



Questions?

**“I GOT RABIES SHOTS FOR BITING THE HEAD
OFF A BAT BUT THAT’S OK - THE BAT HAD TO
GET OZZY SHOTS.”**

OZZY OSBOURNE

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