

Deadly Parasite in Raccoons

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[Charlotte Duggan] Hi, I'm Charlotte Duggan and today, I'm talking with Dr. Shira Shafir, Assistant Professor in the Department of Epidemiology at the UCLA School of Public Health. Our conversation is based on a study about roundworms in raccoons and their effect on the environment. The study appears in the July 2011 issue of CDC's journal, Emerging Infectious Diseases. Welcome, Dr. Shafir.

[Shira Shafir] Hi Charlotte, nice to speak with you today.

[Charlotte Duggan] Dr. Shafir, what are *Baylisascaris procyonis* eggs?

[Shira Shafir] *Baylisascaris procyonis* is the common intestinal roundworm of raccoons. Raccoons all over the United States can be infected with this worm and they have no symptoms of infection. When they have the worms in their intestine, they can pass millions of eggs into the environment every day in their poop. The eggs can't immediately infect people when they're passed on by the raccoons; they must spend about two weeks in the environment before they can infect people.

[Charlotte Duggan] So, how are they a threat to people?

[Shira Shafir] When raccoons are infected, they can pass huge numbers of eggs into the environment and those eggs can survive a very long time. Raccoons are often found near where humans live and raccoons have a habit of defecating over and over in the same place. Because of this, large amounts of raccoon poop, and, therefore, *Baylisascaris* eggs, can accumulate near the places where people live and especially the places where people and children play. When people ingest eggs, they may get infected with *Baylisascaris*. This typically happens when items that have been contaminated with raccoon feces are put in the mouth or are eaten. The most commonly suspected items include soil, wood, leaves and other vegetation, bark, sand, and stones, and also the direct ingestion of raccoon poop. While these don't seem like things that people normally eat, we know that children have a habit of putting almost anything into their mouths. Also, children and people who are developmentally delayed can have poor hygiene habits and will put their dirty hands into their mouths after playing outside.

When people get infected with *Baylisascaris procyonis*, the disease that results is generally very severe. Almost half of all cases have ended in death, the rest have resulted in permanent neurologic problems, including developmental disabilities, seizures, paralysis, and blindness. Mild infections may occur but there 's not enough information now on the possible range of symptoms.

[Charlotte Duggan] What were you trying to learn with this study?

[Shira Shafir] We were trying to discover how long the eggs of *Baylisascaris procyonis* could survive under different environmental conditions that would be relevant in different areas of the country and also relevant for getting rid of them near homes.

[Charlotte Duggan] And what did you find?

[Shira Shafir] We found that while the eggs survive complete drying, what we call desiccation, for six months at room temperature, they all died after seven months with no water. Eggs that were frozen at minus 15 degrees Celsius, or five degrees Fahrenheit, for six months were still completely viable, and even freezing and thawing for five cycles did not affect survival of the eggs. The biggest finding was that eggs were completely killed at 62 degrees Celsius, which is about 143 degrees Fahrenheit. Additionally, while we didn't specifically design experiments to look at the effects of bleach on the eggs, when we exposed the eggs to undiluted household bleach for 90 minutes, they were still able to survive, so we don't believe that bleach is a reliable way to kill the eggs.

[Charlotte Duggan] How would people use heat to kill these eggs around their houses?

[Shira Shafir] Since we found that the temperature at which the eggs die is relatively low, people should be able to use readily available steam-producing devices to disinfect contaminated areas in their homes, particularly solid, non-porous surfaces. Also, if they think that their water might be contaminated with raccoon poop, 62 degrees Celsius is a temperature that's achievable in home water heaters, so it's not necessary to boil water. People do need to be sure that their water heaters are set to at least 143 degrees Fahrenheit if they suspect their water is contaminated.

[Charlotte Duggan] Dr. Shafir, is there anything people can do to reduce their chance of being exposed?

[Shira Shafir] It's important to recognize that we believe the risk of infection is small and there are things we can do to make the risk even lower. One very important way to reduce the chance of being exposed is to reduce raccoon populations near residential areas. This can be accomplished by not feeding raccoons, ensuring that raccoons don't have access to trash or food for domestic pets, and by trapping and relocating raccoons, although this should be done by professionals. Home sandboxes where children frequently play should also be kept covered when not in use. In addition, raccoons should not be kept as pets. Prevention efforts can also be enhanced through hand washing and good hygiene, especially after time is spent outdoors.

[Charlotte Duggan] Thanks, Dr. Shafir. I've been talking with Dr. Shira Shafir about a study that appears in the July 2011 issue of CDC's journal, Emerging Infectious Diseases. You can see the entire article online at www.cdc.gov/eid.

If you'd like to comment on this podcast, send an email to eideditor@cdc.gov. That's e-i-d-editor - one word - at c-d-c-dot-gov. I'm Charlotte Duggan, for Emerging Infectious Diseases.

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