

Animal Health Advisory: *Heterobilharzia americana* (canine schistosomiasis) confirmed in 11 dogs in three Southern California Counties (LA, Orange, and Riverside)

4.19.2023

Key Points

- There are now reports of 11 cases of canine schistosomiasis in dogs from 3 Southern California counties: Los Angeles, Orange, and Riverside. The cases occurred between 2018-2023. The disease is caused by the liver fluke *Heterobilharzia americana*.
- Southern California has not been known to be enzootic for the parasite. All 11 dogs had been swimming in the Colorado River before being diagnosed.
- Infection is acquired from direct contact with fresh water containing the free-swimming life stage of the *Heterobilharzia americana*. Freshwater snails serve as the intermediate host. The parasite is not transmitted directly between dogs or from dogs to humans.
- The disease in dogs has a very gradual, insidious onset, initially causing lethargy, loss of appetite, and weight loss. Gastrointestinal signs such as vomiting, and diarrhea are common. Without treatment, cases progress to severe liver and intestinal disease, and can be fatal.
- Veterinarians are strongly encouraged to learn more about the parasite, including how to order fecal PCR testing, and consider *Heterobilharzia americana* infection as a potential cause for undiagnosed liver and intestinal disease. Veterinarians should report all cases to their respective local agency.

Dear Animal Health Colleagues,

Back in 2019, we issued an alert to the LA County veterinary community about *Heterobilharzia americana* infection (canine schistosomiasis) in two LA County dogs that had spent time in the Colorado River. Recently a veterinarian in Orange County reported 7 cases of schistosomiasis in dogs, and a veterinarian in Riverside County reported an additional 2 cases.

A joint investigation was undertaken by veterinarians from the Riverside County Department of Animal Services, Orange County Animal Services, and the LA County Veterinary Public Health Program. To date, a total of 11 cases have now been confirmed in Southern California between October 2018 and January 2023.

Canine schistosomiasis is caused by a freshwater parasite called *Heterobilharzia americana* and is primarily known to be found in the American South and in the Gulf Coast States. The dogs in this report share similar travel history and may have been exposed while swimming in the Colorado River on the border between California and Arizona.

The confirmed cases span from 2018-2023, involving 11 dogs in 5 households. Nine dogs were diagnosed by fecal PCR testing and 2 were diagnosed by liver biopsy. Six of the dogs did not show clinical signs but were diagnosed by fecal PCR testing due to raised awareness after other

dogs in their social circle were diagnosed. Of the 5 symptomatic dogs, clinical signs included vomiting, lethargy, reduced appetite, diarrhea, and weight loss. One dog succumbed to the disease; the remaining dogs recovered after treatment. Since this disease is not known to exist in Southern California, local veterinarians are requested to learn more about the disease, including how to test for it and treat it (see summary below). Veterinarians also should report any additional cases to help determine whether the parasite is present in the region.

Parasite Range

The *Heterobilharzia americana* parasite is known to be enzootic in North Carolina, South Carolina, Georgia, and the Gulf Coast states including Florida, Louisiana, and eastern Texas. The geographic range for this parasite may be increasing, as small numbers of cases have also been reported from Oklahoma, Kansas, Indiana, and Utah. These 11 cases in dogs that visited the Colorado River suggest that the range may be expanding further, although this has not yet been confirmed.

Life Cycle and Disease

The life cycle of the parasite requires freshwater, such as a mud flat, pond, lake, or river, and the presence of certain species of snails. Raccoons are the natural definitive host and dogs can also serve as a definitive host, intermittently shedding parasite eggs in their feces into bodies of fresh water. Infections have also been documented in opossums, bobcats, deer, coyotes, horses, and many other species. After the egg hatches in the water, a free-swimming form of the parasite penetrates into a snail, where it develops further. It is then released into the water in another free-swimming form, which penetrates the skin of another host, such as a dog. The parasite typically migrates through the lungs and liver, until it matures and mates inside the mesenteric veins of the dog. The eggs are then distributed in the circulation, triggering general inflammation and granuloma formation in the intestines and multiple organs in the body. Some of the eggs migrate into the intestines and are shed in the dog's feces.

Public health considerations

This parasite is known to cause a self-limiting dermatitis in humans ("swimmer's itch").

Transmission

It is important to note that *Heterobilharzia americana* is not transmitted directly between dogs or between dogs and humans. Dogs acquire the infection from exposure to fresh water sources contaminated with the parasite, usually while swimming or wading. *Heterobilharzia americana* cercariae, which are one of the free-swimming life stages of the parasite, directly penetrate the skin of dogs.

Clinical signs

Clinical signs from *Heterobilharzia americana* infection typically have a very gradual, insidious onset. The initial signs may include lethargy, loss of appetite, weight loss, diarrhea, melena (stool dark from digested blood), and vomiting. Other signs reported include coughing, increased gut sounds, and an increase in drinking and urination. A complete blood count and chemistry panel may include a low white blood cell count with an increased eosinophil count, elevated kidney or liver blood values, elevated globulin, or an elevated calcium level.

Diagnosis

Diagnosis of *Heterobilharzia* infection relies on detection of the parasite in a fecal sample, or in a biopsy of an affected organ or granuloma. Infection is most readily diagnosed by fecal PCR testing (see below for diagnostic laboratory options). Standard fecal flotation testing will generally not reveal the eggs, although they may sometimes be found by fecal sedimentation testing in 0.9% NaCl or direct smear. A negative fecal test does not rule out the disease.

How veterinarians can help monitor our community for *Heterobilharzia americana* in dogs:

1. **Learn more about *Heterobilharzia americana*.** Some helpful links are included below:
 - Companion Animal Parasite Council – Canine Schistosomiasis
<https://capcvet.org/guidelines/schistosomiasis>
 - 2021 – Graham et al. *Heterobilharzia americana* infections in dogs: A retrospective study of 60 cases (2010-2019) - case series from Texas (enzootic area) <https://onlinelibrary.wiley.com/doi/full/10.1111/jvim.16127>
 - 2019 Animal Health Alert about 2 Canine Schistosomiasis cases in LA County:
http://publichealth.lacounty.gov/vet/docs/AHAN/AHAN_Schisto_03122019.pdf
2. **Include questions about exposure to natural bodies of freshwater and travel when you take a history.** Note the *exact* location of the body of freshwater. The clinical signs of schistosomiasis in dogs can mimic many other diseases. Exposure to lakes, rivers, streams, and other bodies of fresh water may increase the likelihood of infection, especially in water known to harbor freshwater snails.
3. **Test dogs that have compatible clinical signs and/or exposure history.**
 - **Fecal PCR testing:** This test is available through the College of Veterinary Medicine at Texas A & M University (TAMU). Submit about 1 gram of feces.
 - Veterinarians can send samples directly to TAMU:
<https://tvmdl.tamu.edu/tests/heterobilharzia-americana-pcr-referral-2/>
 - IDEXX: Test code 8871—Fecal PCR test for *H. americana* sent to TAMU
 - Antech: Test code S86975—Fecal PCR test for *H. americana* sent to TAMU
 - **Fecal sedimentation testing:** The parasite eggs may be seen by fecal sedimentation and direct smear testing. A negative test does not rule out the

disease since shedding of eggs can be intermittent. Note that standard fecal flotation testing usually will not reveal the eggs.

- IDEXX: Select Fecal O & P test and write “flukes suspected” on requisition form.
 - Antech: Test code S86157
 - **Biopsy or necropsy of affected tissues.** Parasite eggs should be visible on histopathologic examination.
4. **Treatment:** Firm data for treatment guidance is lacking, but two recommended treatment protocols are listed below. Treatment involves a combination of praziquantel and fenbendazole. Praziquantel is administered at higher doses than needed to treat tapeworm infections, and vomiting has been anecdotally reported during treatment. Fenbendazole should be administered with food to enhance bioavailability.
- Symptomatic dogs: Praziquantel 25mg/kg orally TID for 3 days, in conjunction with fenbendazole 50mg/kg orally once daily for 10 days.
 - Asymptomatic dogs: Praziquantel 5 mg/kg orally TID for 2 days, in conjunction with fenbendazole 24 mg/kg orally once daily for 7 days.
 - Note that repeating the cycle of treatment may be needed. Veterinarians are advised to carefully review the literature and consider retesting as part of care.
 - Links to recent open-access papers for further information and guidance are included below:
 - 2021 – Graham et al. *Heterobilharzia americana* infections in dogs: A retrospective study of 60 cases (2010-2019) - case series from Texas (enzootic area)
<https://onlinelibrary.wiley.com/doi/full/10.1111/jvim.16127>
 - 2021 Cridge et al. Efficacy of a low-dose praziquantel and fenbendazole protocol in the treatment of asymptomatic schistosomiasis in dogs.
<https://onlinelibrary.wiley.com/doi/full/10.1111/jvim.16142>
5. **Prevention:** The only prevention measure is for dogs to avoid direct contact with bodies of water that are known to contain the parasite. At this time, it is not known whether this parasite is truly present in Southern California.
6. **Report any confirmed *Heterobilharzia americana* infections diagnosed at your hospital to the appropriate agency.** Since this parasite has not previously been detected in Southern California, a multicounty effort is underway to investigate cases and determine the source. Information regarding any newly diagnosed cases would be extremely beneficial.

- *Heterobilharzia americana* case reporting form:
<http://ph.lacounty.gov/vet/docs/Forms/Heterobilharzia.pdf>

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Sincerely,

Karen Ehnert, DVM, MPVM, DACVPM
Director
Veterinary Public Health
Los Angeles County Department of Public Health
313 N. Figueroa St, Room 1127
Los Angeles, CA 90012
(213) 288-7060
(213) 481-2375 Fax
kehner@ph.lacounty.gov
<http://publichealth.lacounty.gov/vet/>

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