DEPARTMENT OF ANIMAL SERVICES
County of Riverside, California

Department of Animal Services

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Local Animal Disease: Canine Schistosomiasis Confirmed in 11 dogs in 3 Southern California Counties (LA, Orange, and Riverside)
04/03/2023

Dear Animal Health Colleagues,

Recently a veterinarian in Orange County has reported 7 cases of schistosomiasis in dogs, and a veterinarian in Riverside County has reported an additional 2 cases. These cases were diagnosed following an alert released in 2019 by Los Angeles County Veterinary Public Health regarding 2 cases of schistosomiasis reported by a veterinarian in Los Angeles County. 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 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).
- Report any additional cases to help determine whether the parasite is present in the area (see attachment "Canine Schistosomiasis Case Reporting Form").

Range

The *Heterobilharzia americana* parasite is known to be enzootic in North Carolina, South Carolina, Florida, Georgia, Louisiana, and eastern Texas. The range for this parasite may be increasing, because small numbers of cases have also been reported from Oklahoma, Kansas, Indiana, and Utah.

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, and the eggs are 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 then are shed in the dog's feces.

Public health considerations

This parasite may cause self-limiting dermatitis in humans ("swimmer's itch").

Transmission

It is important to note that canine schistosomiasis is not transmitted directly between dogs or between dogs and humans. Infection is acquired from direct contact (usually swimming or wading) in contaminated fresh water sources, upon direct skin penetration by *H. americana* cercariae.

Clinical signs

Clinical signs from canine schistosomiasis typically have a very gradual, insidious onset. Common clinical signs of canine schistosomiasis in dogs 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. 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:

    - https://capcvet.org/guidelines/schistosomiasis
    - 2021 – case series from Texas (enzootic area) – 60 dogs - 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.**

    a. *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. Several options exist:
        i. Veterinarians can send samples directly to TAMU: https://tvmdl.tamu.edu/tests/heterobilharzia-americana-pcr-referral-2/
        ii. Idexx: Test code 8871—Fecal PCR test for *H. americana* sent to TAMU
        iii. Antech: Test code S86975—Fecal PCR test for *H. americana* sent to TAMU

b. *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.
   i. Idexx: Select Fecal O & P test and write "flukes suspected" on requisition form.
   ii. Antech: Test code S86157

c. *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.

   a. *Symptomatic dogs*: Praziquantel 25mg/kg orally TID for 3 days, in conjunction with fenbendazole 50mg/kg orally once daily for 10 days.
   b. *Asymptomatic dogs*: Praziquantel 5 mg/kg orally TID for 2 days, in conjunction with fenbendazole 24 mg/kg orally once daily for 7 days.
   c. 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.
   d. Links to recent open-access papers for further information and guidance are included below:

      i. https://onlinelibrary.wiley.com/doi/full/10.1111/jvim.16142
      ii. https://onlinelibrary.wiley.com/doi/full/10.1111/jvim.16127

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 *H. americana* cases 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. For your convenience, a reporting form with further instruction and contact information is attached.

Many thanks to the following veterinarians for reporting these cases: Dr. Lauren Norby (Harbor Animal Hospital – LA County), Dr. Matthew Brehmer (Ortega Animal Care Center – Orange County), and Dr. Vinay Dhama (VCA Aacacia Animal Hospital – Riverside County).

Thank you so much for your attention and consideration. Please do not hesitate to contact me if you have any questions.

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Attachments:

1. Canine Schistosomiasis Case Reporting Form