

## Paragonimiasis

### Current Situation

In the past nine months, the Southern Nevada Health District (SNHD) received two reports of paragonimiasis after consumption of live crab at restaurants in Clark County. The first case was a 46 year-old male who consumed live crab in December 2008 and developed hemoptysis two months later. Serological testing confirmed *Paragonimus westermanii*. The case was reported to SNHD in September, 2009. The second case was a 19 year-old male who consumed live crab in August 2009. In December 2009, he developed respiratory distress and hemoptysis and was hospitalized. Initial diagnosis was pleural effusion and acute dyspnea. Routine cultures and cytology returned negative results. The case was placed on antibiotic therapy and discharged. He continued to have symptoms. He was again hospitalized in March, 2010. Serology in April confirmed paragonimiasis. The second case was reported to SNHD in June this year. Neither case had a recent history of travel outside the US.

Because of the long lapse of time between consumption of the crab and the disease report, contamination of the crabs with the *Paragonimus westermanii* parasite could not be confirmed. However, the exposure history and clinical and serological evidence strongly indicate that the parasite was contracted through consumption of raw or undercooked fresh water crab. Although this parasitic disease is uncommon in the United States, there were several cases diagnosed in Orange County, California in 2006 which resulted from consumption of live freshwater crab imported from Japan. Additionally, the Missouri Department of Health and Senior Services (DHSS) recently alerted medical providers about the occurrence of six confirmed and probable human paragonimiasis cases in Missouri. Three of these cases were reported since October 2009. The most recent case was reported in early April 2010. All of these patients had ingested raw crayfish from rivers in Missouri. In the Missouri cases, the parasite identified was *Paragonimus kelli-cotti*.

It is not known how widely fresh water crabs may have been distributed in Clark County or how common the practice of consuming live crab may be. Considering the insidious nature of this parasitic infection, SNHD would like to alert you to this potential problem so that you can appropriately test symptomatic patients who have consumed raw, undercooked, pickled or salted freshwater crabs or crayfish and provide treatment if testing is positive.

### Epidemiology of Paragonimiasis

Paragonimiasis is a disease caused by species of lung flukes of the genus *Paragonimus*. Of eight species, the most commonly associated with disease are *Paragonimus westermani* which is found in Southeast Asia and Japan and *Paragonimus kellicotti* which is endemic to North America. For information about the life cycle of this parasite go to: <http://www.dpd.cdc.gov/dpdx/HTML/Paragonimiasis.htm>.

### Mode of Transmission

Human infection can occur by consumption of contaminated raw or undercooked freshwater crabs or crayfish. Infection can be very serious in humans but is not transmitted from person to person. *Paragonimus* most commonly migrate from the intestines to the lungs, but can also affect other sites including the brain or abdomen. Infection can last for years; many infected people do not appear to be ill.

### Clinical Manifestations

Initial symptoms, in the first three weeks after ingestion, may include diarrhea, abdominal pain, cough, fever, and urticaria while the worms are migrating from the intestines to the lungs.

Eosinophilia is typical and the clinical presentation can mimic tuberculosis. The chronic symptoms of paragonimiasis are caused by the host's inflammatory reaction to the worms and eggs; thus, the incubation period varies. The major forms of disease are pulmonary and extra-pulmonary. **The pulmonary form** most commonly has no, or mild, symptoms. Chronic cough, chest pain, and dyspnea can be present. Heavy

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infestations can lead to paroxysms of coughing with blood-tinged sputum; hemoptysis can be severe. Sputum may appear brown due to the presence of *Paragonimus* eggs. Complications include pleural effusion (exudative with eosinophils), pneumothorax, bronchiectasis, and pulmonary fibrosis. The infection can also affect the liver, spleen, abdomen, skin, and brain. **The extrapulmonary form** is associated with migratory allergic skin nodules caused by immature worms.

### Laboratory Testing

Although detection of eggs in sputum or feces of patients with paragonimiasis is often very difficult, microscopic examination of sputum or feces 2-3 months after initial infection may show characteristic eggs of this parasite that have been expectorated or swallowed, respectively. Eggs may also be seen in other affected fluids and tissues. Eosinophilia may be a helpful diagnostic clue. Serodiagnosis is often very helpful in confirming infections and for monitoring the results of individual chemotherapy. The test codes for local commercial laboratories are as follows:

#### Quest Laboratories:

- O&P (Ova & Parasites)-test code 2900
- Paragonimus antibody, Enzyme Linked Immunosorbent Assay (ELISA) – contact Quest for current test code

#### LabCorp:

- O&P - test code 008623
- Paragonimus antibody, ELISA – test code 842811 (sent to Parasitic Disease Consultants, Tucker, GA).

SNHD is offering to make arrangements to collect and ship specimens to the CDC for testing of persons meeting the outbreak case criteria. A case is a person with symptoms consistent with paragonimiasis (including but not limited to dry cough, fever, eosinophilia, urticaria, rust colored sputum, malaise, diarrhea, abdominal pain, and/or night sweats) and has a history of consuming raw, undercooked, pickled or salted freshwater crabs. Please call 759-1300, Option 2 for case evaluation and testing arrangements.

### Treatment

Praziquantel is the treatment of choice, given for two (2) days [75 mg/kg per day divided into three doses]. Bithionol is an alternative treatment but has more side effects. In cerebral paragonimiasis, steroids are added. For additional information see information in the medical letter at:

[http://www.dpd.cdc.gov/dpdx/HTML/PDF\\_Files/MedLetter/FlukeHermaphroditicInfection.pdf](http://www.dpd.cdc.gov/dpdx/HTML/PDF_Files/MedLetter/FlukeHermaphroditicInfection.pdf).

For a fact sheet for patients, please see the SNHD website at :

<http://www.southernnevadahealthdistrict.org/health-topics/paragonimiasis.php>

In addition, patients may call the SNHD OOE at 759-1300 option 4 for more information.

### Reporting

SNHD is interested in receiving case reports as part of a foodborne illness outbreak investigation. We request that all paragonimiasis cases be reported by telephone to the SNHD Office of Epidemiology at (702) 759-1389 or via fax to (702) 759-1414 using our Confidential Morbidity Report Form which can be found online at:

<http://www.southernnevadahealthdistrict.org/download/epi/nv-morbidity-form.pdf>

or by using our online reporting system at:

[http://www.southernnevadahealthdistrict.org/diseasereports/disease\\_form.php](http://www.southernnevadahealthdistrict.org/diseasereports/disease_form.php)

### References:

County of Orange Health Department, Orange County, CA. "Recent Cases of Paragonimiasis (Lung Flukes) Associated with Live Fresh Water Crab Consumption" Aug. 11, 2006. <http://www.ochealthinfo.com/docs/public/epi/paragafax8-06-2.pdf>

Genevieve County Health Department, MO. "Human Paragonimiasis Following Ingestion of Raw Crayfish from Rivers in Missouri." Missouri Department of Health and Senior Services. May 24, 2010.

<http://www.stegencohealth.org/article-list-standard-pages/60-front-page/195-human-paragonimiasis-following-ingestion-of-raw-crayfish-from-rivers-in-missouri>

Patterson, Jennifer DO, and Rosenbaum, Seth MD. "Paragonimiasis" E-Medicine from WebMD. Updated Apr. 10, 2009 <http://emedicine.medscape.com/article/999188-overview>

Centers for Disease Prevention and Control, Division of Parasitic Diseases. "Parasites and Health: Paragonimiasis" <http://www.dpd.cdc.gov/dpdx/HTML/Paragonimiasis.htm>