

PYTHIOSIS

(INFECTION WITH THE WATER MOLD, *PYTHIUM*)

BASICS

OVERVIEW

- An infectious disease affecting primarily the gastrointestinal tract or skin of dogs and cats
- It is caused by the water mold, *Pythium insidiosum*

GENETICS

- Although large-breed dogs are affected most often, no genetic basis has been documented

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs
- Cats—less commonly

Breed Predislection

- Large-breed dogs, especially those used in hunting or field trial work near water
- Labrador retrievers
- German shepherd dogs may be more likely than other breeds to develop infection in the skin (known as “cutaneous pythiosis”)

Mean Age and Range

- Animals less than 3 years of age are most likely to be infected

Predominant Sex

- Males are affected more often than females, possibly because of increased exposure

SIGNS/OBSERVED CHANGES in the ANIMAL

- Affected dogs usually are not severely ill, until late in the course of disease
- Long-term (chronic) weight loss and intermittent vomiting are the most common signs
- Diarrhea may be evident, if the large intestine (colon) or a large segment of the small intestine is affected
- Regurgitation (return of food or other contents from the esophagus or stomach back up through the mouth) is noted with rare esophageal disease
- Skin (cutaneous) disease characterized by nodules that ulcerate and drain

Gastrointestinal Pythiosis

- Affected dogs usually are bright and alert
- Severe weight loss; emaciation is common
- An abdominal mass often is felt by the veterinarian during physical examination
- Fever is noted occasionally
- Generalized (systemic) signs and abdominal pain may occur with intestinal blockage or obstruction, sudden lack of blood supply that leads to death of intestinal tissues (known as “infarction”), or abnormal opening or hole in the intestines (known as a “perforation”)

Skin (Cutaneous) Pythiosis

- Skin (cutaneous) lesions or lesions under the skin (known as “subcutaneous lesions”) appear as nonhealing wounds; boggy, fluid-filled regions; or poorly defined nodules that become ulcerated
- Multiple draining tracts with blood-tinged discharge or pus often are present

CAUSES

- *Pythium insidiosum*

RISK FACTORS

- Environmental exposure to swampy areas, bayous, ponds, or lakes containing infective *Pythium* spores
- Outdoor activities, such as hunting
- Dependent on geographic distribution—in the United States, pythiosis occurs most often in states bordering the Gulf of Mexico; however, it has been documented in Oklahoma, Arkansas, Missouri, Kentucky, Tennessee, North and South Carolina, Virginia, southern Indiana, and New Jersey; outside the United States, pythiosis has been reported in Australia, Brazil, Burma, Colombia, Costa Rica, Indonesia, Japan, New Guinea, and Thailand

TREATMENT

HEALTH CARE

- The treatment of choice is aggressive surgical removal of all infected tissue; unfortunately, many animals are not presented to the veterinarian until late in the disease, when complete removal is not possible
- Supportive care may include fluids, potassium, nutritional support, and antibiotics (as needed)

ACTIVITY

- Limit activity

DIET

- Feed a highly digestible, calorie-dense diet

SURGERY

- Attempt wide surgical removal of infected tissue, even if medical treatment is contemplated
- Amputation is recommended for treatment of lesions involving the legs
- Enlarged abdominal lymph nodes should be biopsied
- Dogs often improve after lesions causing blockage or obstruction of the gastrointestinal tract are removed surgically, even if significant disease still is present
- Postoperative medical treatment with itraconazole and terbinafine for 2 to 3 months is recommended to decrease the chance of recurrence

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Itraconazole combined with terbinafine (both antifungal medications) appears to be the most effective medical treatment
- Medical treatment should be continued for a minimum of 6 months
- Give itraconazole with food
- Amphotericin-B lipid complex has shown effectiveness in a limited number of dogs with gastrointestinal pythiosis; its use is recommended when the patient cannot tolerate medications administered by mouth

FOLLOW-UP CARE

PATIENT MONITORING

- Monitor for signs of recurrence
- ELISA serologic tests (blood tests that detect the presence of antigens [substances that induce an immune response], of a certain disease-causing agent, in this case *Pythium*) can be used to monitor response to therapy; serology should be checked 2 to 3 months after surgery, or every 3 months during medical treatment
- Abdominal ultrasound is useful in re-evaluating intestinal lesions
- Medical management may reduce the extent of large lesions to the point that they become removable surgically
- Blood tests (liver enzymes) should be evaluated monthly while patient is on itraconazole
- Blood tests (serum blood urea nitrogen, creatinine, and potassium) should be evaluated before each dose of amphotericin-B lipid complex is administered

POSSIBLE COMPLICATIONS

- Sudden (acute) severely painful abdomen and death from gastrointestinal blood clots (medical term for blood clot is “thrombosis”) and abnormal opening or hole in the stomach or intestines (known as a “perforation”)

EXPECTED COURSE AND PROGNOSIS

- Prognosis is guarded to poor, unless complete surgical removal of infected tissue is possible
- Less than 10% of affected animals are cured with medical treatment alone
- Re-evaluation of ELISA serologic tests (blood tests that detect the presence of antigens [substances that induce an immune response] of a certain disease-causing agent, in this case *Pythium*) 2 to 3 months after surgery is an excellent prognostic indicator

KEY POINTS

- Treatment is expensive
- Prognosis is guarded to poor, unless a complete surgical removal of infected tissue is possible