INTRODUCTION

Leptospirosis is a bacterial disease known to cause severe, clinical illness in animals and humans. It is caused by pathogenic leptospires that thrive directly within hosts (for example dogs and humans) and reservoirs (for example rodents), and indirectly within the environment. Owners who have pets that are ill and experiencing lethargy, fever, vomiting and especially those that are jaundice should seek veterinary attention immediately, not only to aid in their pet’s health but also to protect themselves from contracting the potentially deadly zoonotic disease.

ETIOLOGY and PATHOGENESIS

Leptospirosis is a worldwide, zoonotic disease of many animals caused by the spiral-shaped bacteria *Leptospira interrogans sensu lato* (Greene *et al.*, 1998). There are at least eight serovars or strains of the species that are of significant importance for dogs and cats. The most commonly diagnosed serovars in canine leptospirosis have been canicola, icterohaemorrhagiae, grippotyphosa, pomona, and bratislava (Greene *et al.*, 1998). Serovars are maintained in nature by numerous subclinically or asymptomatic infected wild and domestic animal reservoirs that serve as potential sources of infection and illness for humans and other incidental animal hosts (Greene *et al.*, 1998). Incidental hosts may develop severe clinical signs and can shed the organism. Examples of incidental hosts include, companion animals as well as livestock like cattle, pigs and horses. According to statistical and epidemiological studies, host types can be dynamic with time and can change with geographic locations of the world (Greene *et al.*, 1998).

Transmission of leptospirosis occurs by direct or indirect contact. Direct transmission occurs via oronasal exposure with infected urine, venereal or placental transfer, bite wounds, or ingestion of infected tissues (Greene *et al.*, 1998). Leptospire contact with mucous membranes and abraded skin can also be a method of transmission. Indirect (fomites) transmission, a very common form of transmission, occurs via exposure to contaminated sources of water, for example ponds, rivers and water catchment tanks, as well as soil, food or bedding (Birnbaum, 2000). Spirochetes (organisms) optimally survive for weeks in the environment with conditions such as stagnant or slow-moving warm water and in soil with a neutral or slightly alkaline pH. These organisms do not survive in freezing conditions. The significance of disease transmission is unknown in association with invertebrates and insects. However, there is evidence of spirochetes surviving within these animals. Transmission to humans can occur directly or indirectly as described previously, but can also occur from recovered dogs that have experienced leptospirosis. The reasoning behind this is that recovered dogs excrete the organism in urine intermittently for months after infection.
Leptospires enter the incidental host’s system by penetrating abraded skin lesions or mucous membranes found within the nose, mouth, eyes and genitalia. These leptospires rapidly multiply while entering the vascular system. Further replication and spread occurs in the kidney, liver, spleen, central nervous system or neurologic system, eyes and reproductive tract (Greene et al., 1998). Increases in serum antibodies and immunity will clear the spirochetes from most organ systems; however, the spirochetes may persist within the kidney and be shed in the urine for weeks to months (Greene et al., 1998). Host susceptibility and the virulence of the organism will determine the extent of damage to internal organs (Midwinter et al., 1994).

**CLINICAL SIGNS**

Cats infected with leptospirosis have clinical signs that are usually mild or inapparent, although there are leptospires present within the blood and urine of the animal as well as histological evidence of liver and kidney inflammation (Greene et al., 1998). On the other hand, dogs are more clinically affected, especially that of young. The clinical findings concerning canine leptospirosis are dependent on the immunity of the host or animal, the age of the host or animal, the virulence of the serovar and the environmental factors that may affect the organism. The first and most common clinical symptoms seen in practice are lethargy, fever, generalized muscle tenderness, inappetance and shivering. Dehydration, vomiting, bloody diarrhea, increased respiration and heart rates, jaundice and death can soon follow. Serologic and microbiologic evaluation for leptospirosis should be performed on dogs with fever of unknown origin, unexplained kidney or liver disease, or inflammation of the anterior uvea of the eye (Greene et al., 1998). In areas where leptospirosis has been reported, evaluations should be performed on healthy dogs in kennels, multi-dog households and neighborhoods (Greene et al., 1998).

**TREATMENT**

Treatment by a veterinarian is supportive, symptomatic and highly dependant on the severity of the disease with or without complicating factors such as kidney or liver dysfunction. To protect other animals and staff of the veterinary clinic, isolated hospitalization is highly recommended and essential. Intravenous (IV) fluids administered by your veterinarian are used to replace fluid deficits encountered by inappetance, vomiting and diarrhea. Severely affected animals may require plasma or whole blood transfusions to support vascular abnormalities. Peritoneal dialysis can be considered in cases of kidney dysfunction. Antibiotics, for example Penicillin or Ampicillin are the antibiotics of choice and are used to reduce fever and bacteria within the bloodstream. These antibiotics also are used to inhibit multiplication of the organism and rapidly reduce fatal complications of infection such as liver or kidney failure (Greene et al., 1998). Antibiotics such as Doxycycline are used to eliminate the carrier state.
PROGNOSIS

The prognosis is guarded which means that the animal must be carefully monitored while being treated within the hospital and following treatment as an outpatient. If the animal has severe and debilitating symptoms, the prognosis may be critical and involve mortality.

PREVENTION

Prevention of leptospirosis involves elimination of the carrier state (Greene et al., 1998). Problems arise because wild animal reservoirs for example rodents and asymptomatic domestic animals like cats can continue to shed the organism without detection. Control of rodents in kennels and households, maintenance of environmental areas to decrease bacterial survival, and isolation of infected animals, therefore, are important to prevent the spread of disease (Greene et al., 1998). Animal vaccinations using various serovars of leptospirosis are effective and available in the control of this disease.

ZOONOTIC POTENTIAL and PUBLIC HEALTH CONSIDERATIONS

The majority of infections in people are among those who engage in fresh-water activities or who experience occupational exposure to wildlife or domestic animal hosts (Alani et al., 1993) (Belton, 1993) (Jackson et al., 1993) (Schmidt et al., 1989). In several reported cases, concurrent exposure of people and dogs can occur. Contaminated urine is highly infectious for people and for susceptible animal species; therefore, contact with urine on mucous membranes or skin abrasions should be avoided (Greene et al., 1998). When handling infected animals or dealing with areas of contamination, protective gear should be worn such as gloves, eye protection and face masks. Areas contaminated by infected urine should be washed thoroughly with detergent and then treated with iodophor disinfectants to which the organism is very susceptible (Greene et al., 1998).

LITERATURE CITED


