



Leptospirosis: A Re-Emerging Public Health Problem

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Conflict of interests: The author has declared that no conflict of interest exists.

How to cite this article?

Doot *et al.*, 2023. Leptospirosis: A Re-Emerging Public Health Problem. *Biotica Research Today* 5(3), 232-234.

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Abstract

Leptospirosis is a zoonotic illness that can spread to other animals and humans and is brought on by infection with one of the pathogenic serovars of the *Leptospira* genus. Almost all mammals are susceptible to the disease, which has a wide spectrum of clinical symptoms, from a moderate, asymptomatic infection to multiple organ failure and death. Key discoveries include liver, kidney, and respiratory diseases. The best way to diagnose is by combining PCR assay and serologic tests. Although antimicrobial therapy is frequently successful, organ damage might be irreversible.

Keywords: Animal, Infection, *Leptospira*, Re-emerging

Introduction

Leptospirosis is also known as “Weils disease” or “Rice field worker’s disease” or “Stuttgart disease” or “Seven day fever” or “Sugarcane worker’s disease”. Leptospirosis is a re-emerging zoonotic disease caused by infection with any of several pathogenic serovars of *Leptospira*. Almost all mammals are susceptible to the disease, which has a wide spectrum of clinical symptoms, from a moderate, asymptomatic infection to multiple organ failure and death. *Leptospira* are kept alive in the wild by infecting the kidneys of carriers including rats, dogs, cattle, horses, sheep, goats, and pigs. *Leptospira* can persist for years in the urine of these animals. Rats and dogs are likely frequent causes of infection for people.

Although leptospirosis in cats is still little understood, there is evidence from research using PCR assays and serologic testing that shows cats can be infected with leptospires and can shed the organisms, with outdoor cats probably being more susceptible. Cats have the ability to spread the virus and contribute to environmental damage. Although there is still more research to be done in this area, it is likely that cats are vulnerable to leptospirosis and may exhibit clinical symptoms that are comparable to those of dogs. This is

true even though most infections are thought to be mild or subclinical.

Etiology

Leptospira are picky, slow-growing, aerobic, gram-negative spirochetes that move in a distinctive corkscrew-like manner. *Leptospira*’s taxonomy is complicated and difficult to understand. The pathogenic *L. interrogans* and the saprophytic *L. biflexa* were the two categories into which *Leptospira* were formerly categorized (Feresu, 1990).

Host Susceptibility, Epidemiology and Transmission of Leptospirosis in Animals

All mammals have the potential to get pathogenic *Leptospira* infection. Cattle, swine, dogs, and horses are the most often identified carriers of leptospirosis among common companion animals and farm animals. Leptospirosis is a reemerging infectious illness that can be found anywhere in the world. The infection is more common in hot, humid areas and is endemic to many tropical regions. The disease is more seasonal in temperate settings, peaking following times of rainfall.

Although more than 250 pathogenic *Leptospira* serovars have been identified, leptospiral serovars in each given

Article History

RECEIVED on 26th February 2023

RECEIVED in revised form 09th March 2023

ACCEPTED in final form 10th March 2023

subset are common within a specific location or environment and are connected with one or two maintenance hosts that serve as infection reservoirs. Animals used as maintenance hosts include both domestic and wild species occasionally. Leptospirosis is typically characterized in maintenance hosts by a high incidence of infection, weak immune responses, a small number of organisms in tissues, relatively minor acute clinical symptoms, and persistent infection in the kidneys and occasionally the genital tract.

Leptospirosis has a limited infection incidence in accidental hosts, severe clinical symptoms, and a brief renal phase of infection. The immune system reacts strongly to incidental host infections, and the quantity of organisms in the tissues of affected animals is higher. Serovar Grippotyphosa infection in dogs or serovar Icterohaemorrhagiae infection in cattle and swine are examples of this type of infection (Baker and Little, 1948).

Transmission between hosts used for maintenance is frequently direct and involves contact with contaminated milk, urine, or placental fluids. The infection might also pass between people or through the placenta. More often than not, incidental hosts become infected indirectly through contact with surfaces that have been polluted by maintenance hosts that are subclinically ill and produce leptospire in their urine. Leptospire thrive in wet soil and fairly warm temperatures; they don't last long in dry soil or at temperatures below 10 °C or above 34 °C. By freezing, dehydrating, or being exposed to direct sunshine, the organisms are destroyed.

Zoonotic Risk of Leptospirosis in Animals

The majority of *Leptospira* pathogenic serovars can infect humans, however as they are only incidental hosts, they are not significant infection reservoirs. Veterinary professionals, those who care for livestock and dairy workers are at higher risk due to occupational exposure. Recreational exposure to streams tainted with domestic animal or wild animal urine also carries a risk. *Leptospira* infections are most commonly contracted by mucous membrane contact with infectious body fluids, such as urine or blood in severe cases (Lilenbaum and Martins, 2014).

Leptospirosis can range in severity in humans from preclinical to severe, and it can be fatal due to renal, hepatic, or leptospiral pulmonary haemorrhage syndrome. The most typical clinical symptoms include myalgia, malaise, rash, eye discomfort, fever, and headaches. Pregnant women's exposure is especially concerning because it has been linked to transplacental infection, abortion, and newborn infection via breastfeeding. A definitive diagnosis requires laboratory methods (Feresu, 1990).

Veterinarians may want to put in place an infection control programme where handling animal body fluids is only done with gloves on because it is difficult to diagnose leptospirosis in animals based on clinical indications alone. While handling or caring for animals who are suspected or confirmed to have leptospirosis, workers must take measures. Wearing gowns, shoe covers, and gloves are

appropriate precautions to take in order to prevent contaminating exposed skin or spreading pathogens. To prevent coming into touch with aerosolized organisms on mucous membranes while handling wet bedding or cleaning cages, stalls, or runs, face shields should be worn.

Clinical Findings

The host species, pathogenicity of the strain and serovar of *Leptospira*, age, and physiologic state of the animal are all factors that affect the clinical manifestations of leptospirosis. In the maintenance host in particular, subclinical infections are frequent. Leptospirosis is an acute, systemic, frequently febrile disease that causes kidney or liver damage in accidental hosts. Other body systems may also be affected, which could lead to clinical issues like uveitis, pancreatitis, haemorrhage, hemolytic anaemia, muscle soreness, or respiratory conditions (Baker and Little, 1948).

Localization and persistence of the organism in the uterus in incidental and maintenance hosts that are pregnant at the time of infection may result in foetal infection, with subsequent abortion, stillbirth, birth of frail neonates, or birth of healthy but infected progeny. In contrast to maintenance hosts, when abortions or other reproductive sequelae may occur several weeks or months later, accidental hosts typically experience rapid abortions (Feresu, 1990).

Diagnosis

The diagnosis is based on the following criteria:

- History.
- Clinical signs.
- Laboratory findings - Elevation of leucocytic count, sign of anaemia, rise albumin value, rise BUN level.
- Combination of serologic testing to detect antibodies and PCR assay to detect organisms (Lilenbaum and Martins, 2014).

Treatment

- Intramuscular injection of penicillin, Ampicillin or doxycycline is recommended. The treatment should be continued for 5-7 days.
- Supportive treatment should be given to monitor the kidney function. Corticosteroid may be used to speed up the elimination of urea (Feresu, 1990).

Prevention

Although mice, raccoons, opossums, and skunks are widely seen in both rural and urban settings, it might be challenging to avoid exposure to both wild animals and domestic animals that could serve as *Leptospira* maintenance hosts. The use of polyvalent inactivated vaccines is the cornerstone of leptospirosis prophylaxis. Leptospirosis immunity is thought to be serovar-specific, but this belief has been called into question (Lilenbaum and Martins, 2014).

Conclusion

The spread of leptospirosis is facilitated by a number of carrier animals, most of which do not exhibit clinical symptoms but nevertheless excrete germs in the urine. When unintentional hosts are exposed to settings contaminated by carrier animal urine, disease develops. A zoonotic illness is leptospirosis. Clinicians should use barrier nursing precautions when caring with leptospirosis suspected. If someone has been exposed to leptospirosis or exhibits symptoms that could indicate the illness, they should contact a doctor.

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