Leptospirosis in Cats

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ABSTRACT

Leptospirosis, a zoonotic disease, is caused by pathogenic spirochetes belonging to the genus Leptospira. It is widely considered one of the most prevalent zoonoses in terms of both geographic distribution and the variety of animal species susceptible to acute illness or acting as renal carriers. Tropical and subtropical regions, such as Thailand, experience a higher incidence of leptospirosis in humans and animals, making it a significant public health concern in those areas.While clinical signs of leptospirosis in cats have yet to be thoroughly investigated, previous studies have shown that cats with polyuria and polydipsia are more likely to have anti-Leptospira antibodies. However, in cats, the clinical signs are usually mild, despite the presence of leptospires in their blood and urine. Reported clinical signs in infected cats (confirmed through MAT and/or PCR) include polyuria, polydipsia, haematuria, uveitis, lameness, lethargy, anorexia, weight loss, ascites, vomiting, diarrhea, pain on handling, and inflammatory lesions on the skin and digits. Various diagnostic tools can be employed, such as the microscopic agglutination test (MAT), indirect hemagglutination assay (IHA), or immuno-enzymatic assays (ELISA) to detect specific antibodies. Leptospira or their components can also be identified in urine or tissues through culture, dark field microscopy, immunostaining, or PCR.Human infections of leptospirosis can be acquired by individuals in certain occupations, such as veterinarians, farmers, animal caretakers, and researchers, as well as people exposed to pet dogs or domestic livestock during their daily activities. Farmers, veterinarians, and abattoir workers are particularly at risk due to their occupation.

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1. INTRODUCTION

Adolph Weil's description of a distinct case of jaundice accompanied by splenomegaly, renal problems, conjunctivitis, and skin rashes initiated the modern study of leptospirosis in 1886 (Haake and Levett 2014b). It later became as "Weil's disease". Despite the fact that its specific etiology was still unknown, there were signs of contagiously and frequently affecting to those who worked outside and around water. Persons susceptible to epidemics were, sewage workers, rice farmers, and coal miners. Over the following decades, there was a notable advancement in the comprehension of leptospirosis. An important discovery was the fact that leptospirosis could infect practically all mammalian species, particularly rodents. Additionally, the domestic animals were the source of human infection (Thayaparan et al. 2013). Dutch researchers, isolated a strain from canines and continue to use this strain as the type strain for serovar Canicola (Francey et al. 2020). The sickness in cattle was first reported in 1940 in Russia, when it was called "infectious yellow fever of cattle". The variety of leptospirosis serovars and host animals that impacted in 1950s significantly increased. Especially in dogs, cattle, swine, horses, and possibly sheep, this disease had been well-documented by 1980s as a substantial veterinary concern with significant economic ramifications (Ryan et al. 2012).

Over the next decades, it became clear that leptospirosis may present itself in both humans and animals in a wide variety of ways. These symptoms ranged from a moderate febrile sickness, frequently mimicking "influenza-like" symptoms, to severe and rarely deadly illnesses marked by acute liver and kidney failure as well as pulmonary bleeding (Bharti et al. 2003; Gouveia et al. 2008). Evidently, the serovar has an impact on the development of infection for example, human infections caused by serovar Hardjo do not frequently cause death. But it is also obvious that a variety of host and environmental factors can have an impact on the disease progression. Even serovars frequently linked to serious and deadly illnesses can sometimes result in mild infections (Gouveia et al. 2008). Leptospirosis is now known to be the most common zoonotic disease in the world due to the isolation of leptospires from all mammalian species in all continents, with the exception of Antarctica. Additionally, it continues to be a major disease factor in many domestic animal species (Adler 2014). The first documentation of feline leptospirosis dates back to 1972. Prevalence studies have shown that the primary serovars found in cats depending on the region and different species (Schuller et al. 2015). Cats can get leptospiral disease through consuming contaminated prey, particularly when it comes in contact to serovars from the Autumnalis and Ballum serogroups. This shows how cats' propensity for predatory behavior makes them vulnerable to infection (Adler 2014). Due of their near proximity to reservoir hosts, outdoor cats are more likely to develop leptospires. In rural areas, cats can get sick through contact with pig and cow urine, which are potential sources of the bacterium. These elements work together to increase the likelihood that cats living outside or in rural regions may become infected with leptospirosis (Azócar-Aedo et al. 2014; Garoussi et al. 2015). This suggests that an infected cat can potentially increase the likelihood of disease incidence and propagation to leptospirosis for both people and other animals living in the same habitat. It highlights how crucial it is to be aware of risk and implementation of the necessary precautions to safeguard health of all family members living in the home as well as pets (Rodriguez et al. 2014).

2. LEPTOSPIRA THE ORGANISM

Leptospires, are members of the spirochete family, around 0.1mm in diameter and 6–20mm long. Both pathogenic and saprophytic species can be found in the genus Leptospira (L.) (Krøjgaard et al. 2009), having 64 species that are divided into 24 serogroups and over 300 serovars (Vincent et al. 2019). These bacteria are highly motile with an elongated, helically coiled structure, and are distinguished by their particular morphological characteristics among spirochetes. Their ends are distinctively fashioned like a

"question mark" or hook (Pn 2001). *L.interrogans* (which comprised the pathogenic serovars) and L.*biflexa* (which included the non-pathogenic saprophytic serovars) were initially considered to be the two species that made up the genus(Levett 2015). A genetic classification system has essentially supplanted the traditional phenotypic approach of classification. All serovars of *L. interrogans sensu lato* and *L. biflexa sensu lato* are included in this updated method. Taxonomy frequently refers to a species complex as "sensu lato," which is a Latin phrase that meaning "in the broad sense" (Adler 2014). Currently, about 20 species of Leptospira have been identified, and at least ten of those are known to be pathogenic (Levett 2015). The discovered Leptospira species include five species with uncertain pathogenicity and seven saprophytic species (Bulach et al. 2016). The cytoplasmic membrane and peptidoglycan cell wall of leptospires are linked intimately, and both layers are further covered by an outer membrane (Cullen et al. 2004). Leptospires, are thought to require oxygen for growth. 28°C to 30°C is the range in which they grow most effectively. They choose simple fortified media with vitamin B1 and B12, ammonium salts, and long-chain fatty acids. It is to noteworthy that they only use long-chain fatty acids because they can convert these fatty acids through beta-oxidation due to their ability of carbon supply (Krøjgaard et al. 2009).

3. LEPTOSPIROSIS

The spread of pathogenic Leptospira spirochetes results in the zoonotic disease known as leptospirosis (Vincent et al. 2019). According to Adler (2014), leptospirosis is a systemic disease that can affect both humans and domestic animals. Dog, cattle and swine are the main afflicted animals. Fever, renal and hepatic insufficiency, pulmonary signs, and reproductive failure are the symptoms of disease. Clinical manifestations can differ greatly, and many instances might go unrecognized. Leptospirosis is linked with particular serovars that are tailored to the hosts such as Canicola in dogs, Bratislava in horses and pigs, Hardjo in cattle, and Australis and Pomona in pigs (Adler 2014; Andre-Fontaine 2006).
The definitive host of Leptospira serovars are known with their association to hosts for Canicola, Hardjo, Pomona and Bratislava includes dog, cow, and sheep, respectively. These hosts are essential in order for germs to spread across the environment. Humans are unlikely to be important sources for the transmission due to disease severity, making them unlikely to be incidental hosts. Definitive hosts normally contract the infection and rarely display clinical symptoms. Animals infected with serovars are anticipated to display more severe clinical symptoms. Rodents are the primary asymptomatic Leptospira reservoir, which is well acknowledged and well-documented (Levett 2001). Cats are susceptible to develop leptospirosis from rodents. In this aspect, rats are the primary source of infection for cats (Weis et al. 2017).

4. EPIDEMIOLOGY OF LEPTOSPIROSIS

Due to vast geographic distribution and capacity to infect a variety of animal species, either producing acute infections or functioning as kidney carriers, leptospirosis, caused by pathogenic species of Leptospira, is known as one of the most common zoonotic disease. It is widely recognized about the clinical manifestation and progresses of disease in both domesticated animals and humans (Adler 2014; Haake and Levett 2014a). Leptospirosis is endemic on earth, and tends to become more common in summer season. Most diseases in tropical areas tend to happen during and after rainy seasons (Adler 2010; Levett 2001). In tropical and subtropical areas, leptospirosis is extremely common in both humans and animals, and it is of major public health concern in Thailand (Hinjoy 2016). Leptospirosis normally affects 6.6 out of every 100,000 people in Thailand each year on average. The incidence can dramatically

increase during outbreaks, reaching up to 25 cases per 100,000 individuals. They are unable to reproduce and can survive in damp soil for several months with on the host(Adler 2014; Levett 2001). The three main risk factors for leptospirosis transmission in people are: (1) exposure to water; (2) interaction with rodents and (3) transmission through livestock or pets. These elements greatly influence how leptospirosis spread throughout communities (Mwachui et al. 2015).

Table 1 offers a summarized view of the limited researches conducted in multiple locations to ascertain the frequency of DNA sheds in the urine of cats indicating Leptospira. The data available in the table illuminates the scope of investigation regarding leptospirosis in feline populations throughout the world. However, due to the limited nature of the research, further studies may be required to fully grasp the prevalence and significance of Leptospira DNA shedding in cats, both for public health and veterinary purposes (Murillo et al. 2020). The studies cited revealed a considerable variation in the frequency of DNAs indicating the Leptospira sheds in faline urine, with percentages ranging from 0% to 67.8% (Murillo et al. 2020).Notably, these findings did not establish a definite connection to medical illness. The recorded incidence rate appears to be influenced by factors such as the real-time location, specific primers chosen by PCR, and additional variables, contributing to the divergence in results.

Table 1: An overview of recent studies on the frequency of Leptospira DNA shedding in cats' urine.

Location	Number of samples	Gene target/primer set	Prevalence (%)	Reference
Reunion Island	172	rrs2, lipL32 and lipL41	0.6	(Murillo et al. 2020).
Thailand locations	260	lipL32	0.8	(Sprißler et al. 2019).
Algeria – Algiers	107	rrs (16S) and hsp	0	(Zaidi et al. 2018).
Germany Munich	215	lipL32	3.30	(Weis et al. 2017).
Australia Christmas Island	59	23S	42.4	(Dybing et al. 2017).
Canada Quebec	200	G1 and G2 and B64-I/B64-II	3.5	(Bourassi et al. 2021).
Réunion Island	30	lipL32	26.6	(Holzapfel et al. 2021).
Taiwan Southern Taiwan	236	G1/G2 and Leptospira rrs (16S)	67	(Chan et al. 2014).

5. SIGNS

Leptospirosis in cats has not yet been fully investigated in terms of its clinical symptoms. Research from past has indicated that cats who exhibit polyuria and polydipsia symptoms (increased urination and thirst) are more likely to have anti-Leptospira antibodies. This shows a possible connection between these clinical symptoms and feline leptospirosis infection. However, more investigation is required to fully comprehend the disease's clinical presentation and effects on feline (Langston and Heuter 2003; Moinet et al. 2010). Even though their serum and urinary excretion contained leptospira traces, cats often exhibit only modest clinical symptoms. Based on confirmation through MAT (microscopic agglutination test) and/or PCR (polymerase chain reaction), infected cats have displayed a variety of clinical signs, including polyuria (increased urination), polydipsia (increased thirst), haematuria (blood in the urine), uveitis (inflammation of the eye), lameness, lethargy, anorexia (loss of appetite) and weight loss (Lapointe et al. 2013; Mylonakis et al. 2005; Ojeda et al. 2018; Rodriguez et al. 2014; Shropshire et al. 2016; Weis et al. 2017).The thoracic and peritoneal cavities of the animals exhibit pathological signs, including hemorrhagic or straw-colored secretions (Arbour et al. 2012). Like in canines, feline leptospirosis can lead to acute renal injury, which has the potential to develop into CKD (chronic kidney disease) (Schuller et al. 2015; Sykes et al. 2011). Compared to affected dogs, liver lesions are more seldom found in affected cats. Leptospiruria, or a leptospire's existence in the urinary excretions, has been observed in experimentally disease induced faline. In addition, pathogenic Leptospira species' DNA has been found in the urine of both stray and domestic cats (Chan et al. 2014).

6. PATHOGENESIS

From asymptomatic to severe, acute sickness, leptospiral infection can present itself in a variety of symptoms. Factors like features of the host and specific serovar of the infecting organism have an impact on specific outcomes (Adler 2014). There aren't many detailed reports on the clinical illness that Leptospira species induce in house cats. Though the precise disease pathophysiology in cats is still unknown and can be differentiated from dogs to human disease (Hartmann et al. 2013).

Small incisions, mucous membranes like the conjunctiva, or even damp skin are all possible entry points for leptospira in the body. When the bacteria are in the body, they circulate in the bloodstream, and this bacteremic phase can last up to seven days (Hartmann et al. 2013). Usually, the bacteraemic phase of the infection is when the acute clinical disease first manifests (Greene 2006). The endothelium in small blood arteries is harmed by the infection, which leads to localized ischemia in organs. This can result in meningitis, myositis, placentitis, renal tubular necrosis, hepatic damage, and pulmonary damage (Goldstein 2010). The bacteria reproduce and remain within the cells of the renal tubule epithelium, which allows them to colonize the kidneys in the majority of infected animals. Nephritis, an inflammation of the kidney tissue, is brought on by this replication process, which also causes the production of cytokines and the recruitment of inflammatory cells (Adler 2010; Greene 2006; Levett 2001). According to reports, cats infected with leptospirosis may experience chronic interstitial nephritis, a disorder that can harm the kidney tissue over the long term. Cats with this condition may develop persistent and deteriorating renal impairment as a result of interstitial tissue inflammation in the kidney (Millán et al. 2009). Leptospires reach the tubular lumen of the kidneys about 10 days after infection and are subsequently eliminated in urine. Nephritis, an inflammation of the kidney tissue, can occur as a result of this excretion process, which can last for days to months (Adler 2010; Greene 2006; Levett 2001). In fact, various species and individual animals can range greatly in the length and severity of leptospires' urine-based elimination. The amount and time of leptospires' excretion in urine are also influenced by the particular serovar that infects them. These differences add to the complexity and variety of leptospirosis presentations seen in various instances (Adler 2014). Leptospiral DNA was found in cats' urine for more than 8 months after infection, according to an epidemiological investigation, with little to no correlation to clinical symptoms. This leptospirosis carrier state in cats increases the risk of leptospirosis transmission and environmental maintenance even when the feline hosts show no outward symptoms of sickness (Weis et al. 2017).

It has been noted that both humans and dogs can develop Leptospiral Pulmonary Hemorrhage Syndrome (LPHS), which is thought to be prevalent in 70% infected dogs. Affected people may experience severe respiratory discomfort and consequences as a result of this serious illness, which is characterized by lung bleeding and inflammation (Kohn et al. 2010). Acute clinical indications of canine LPHS are frequently present, and they are characterized by significant alveolar and sub-pleural hemorrhages that cause dyspnea (difficulty breathing). Studies have demonstrated that feline instances of leptospirosis may present with multifocal liver necrosis, fibrosis, and chronic hepatitis, even though LPHS has not yet been recorded in cats. According to these observations, leptospirosis can cause hepatic problems in cats as opposed to the pulmonary hemorrhage syndrome seen in dogs (Arbour et al. 2012; Millán et al. 2009; Rodriguez et al. 2014).

Hemorrhages, jaundice, and a drop in platelet count are just a few of the symptoms that might appear in severe leptospirosis cases. Additionally, frequent findings include mild granulocytosis and splenomegaly, or enlargement of the spleen. Once there are circulating antibodies, opsonophagocytosis is used by the body to remove leptospires from the blood and tissues. Even though the condition can seriously harm tissue, it is frequently treatable, and total organ recovery, particularly in the kidneys and liver, is possible. But there could be issues, such recurrent injury like myocarditis that leaves scarring. It is generally known that "white spots," or scarring, can be observed macroscopically in the kidneys of pigs and dogs (Adler

2010). Leptospires can harm the host's tissues and make them ill, although the precise methods by which they do this are yet unclear. Understanding the molecular basis of Leptospira pathogenicity has been hampered until recently by the paucity of genetic tools to modify them. Even though reports suggesting pathogenic processes have been around for a while, the precise leptospiral component that causes these consequences frequently went undiscovered. Cats may be a source of infection for humans, according to recent research that have demonstrated that they can excrete harmful Leptospira in their urine. This emphasizes the necessity to take into account cats as potential carriers and contributors to the transmission of the bacterium to people. In order to prevent and control the spread of the illness from cats to humans, it is important to recognize the contribution of cats to the spread of leptospirosis (Chan et al. 2014; Weis et al. 2017).

7. CLINICO-PATHOLOGICAL DATA

The leukocyte count can fluctuate depending on disease progression and severity. Low levels of leukocytes, may occur during leptospiremia (the blood having leptospires), followed by a transition to leukocytosis, characterized by an increase in leukocytes, particularly neutrophils. Progressing towards the critical stage, level of white blood cells reaches a range of 16.5–45 x 10^9/L (with the reference interval being 2.75–11.75 x 10^9/L) (Moritz et al. 2004; Schuller et al. 2015; Sykes et al. 2011).

7.1. SERUM BIOCHEMISTRY

Around 80-90% of canine leptospirosis cases show elevated levels of urea and creatinine concentrations (Sykes et al. 2011). Upon diagnosis, most infected cats typically exhibit azotemia, with the condition often ranging from moderate to severe intensity (Lapointe et al. 2013; Pn 2001; Rodriguez et al. 2014; Weis et al. 2017). Leptospira toxins hinder the activity of Sodium/Potassium ATPase in the renal tubular epithelium of both cats and dogs. This interference results in considerable renal electrolyte losses, ultimately leading to the development of severe hypokalemia, a condition characterized by low blood potassium levels (Sykes et al. 2011). Observations suggest that cats affected by leptospirosis experience elevated serum phosphorus concentrations, which are probably connected to a reduction in the glomerular filtration rate (Arbour et al. 2012).

7.2. ULTRASONOGRAPHIC FINDINGS

Renal ultrasonographic results are similar to those of canine leptospirosis, according to few published data on feline leptospirosis. The kidneys appear granular, larger and the cortical region is comparatively smaller to medullar region, the cortical region of kidney is slightly hyperechogenic, & the corticomedullary junction has less definition (Arbour et al. 2012; Beaudu-Lange and Lange 2014).

8. SPECIFIC TESTING

Due to the wide range of clinical symptoms, diagnosing leptospirosis is difficult and depends on a number of laboratory tests. Using techniques like the MAT, the indirect hemagglutination assay (IHA), or immuno-enzymatic assays (ELISA), these procedures can identify certain antibodies. Leptospira or their components can also be found in urine or tissues using PCR, dark field microscopy, immunostaining, or culture (Bharti et al. 2003; Levett 2001; Vincent et al. 2019).The advantage of specificity for serovars or serogroups makes MAT the most often used diagnostic test. However, it is unable to distinguish between antibodies produced by infection or immunization, which may present particular issues in animals, particularly when determining

disease status for import or export screening purposes (Vincent et al. 2019). High levels of sensitivity and specificity are displayed by the MAT. However, because live cultures of distinct Leptospira serovars are common in particular geographic regions are required, it might also provide difficulties (Miller et al. 2011). Leptospiral sonicates, recombinant lipoproteins like LipL32, LigA, or the outer membrane porin OmpL1, as well as a wide variety of antigen preparations have all been used to create various ELISA assays. These automated ELISA assays do away with the requirement to maintain live cultures. It's crucial to remember that they could not have the same sensitivity and specificity as MAT, thus depending simply on ELISA is not advised. The following techniques can also be used to identify antibodies: macro-agglutination, latex agglutination, lateral flow assays, and IgM dipstick testing. The only reliable diagnostic method for leptospire detection is culture-based detection, but this method is hampered by some Leptospira strains' sluggish growth rates and the lengthy incubation times needed to generate an isolate in culture. Fresh tissue, blood, or urine samples that were taken prior to the start of antibiotic therapy are necessary for the successful isolation of Leptospira. A minimum of two ten-fold dilutions of tissue fluid or homogenate must typically be inoculated, and depending on the degree of contamination, specific antimicrobial drugs such 5-fluorouracil may be employed to prevent contamination (Levett 2001). It takes up to 13 weeks of incubation at 30°C and weekly dark field microscopy (DFM) inspection for cultures to be deemed negative. Culture is not seen as practicable as a standard diagnostic test for specific individuals due to this extended time frame. However, it is still important for epidemiological studies (Vincent et al. 2019).

The sensitivity and specificity of other methods for finding leptospires in urine, blood, or other tissues, such as DFM, immunofluorescence, antigen ELISA, or immunoprecipitation, are constrained. The infecting serogroup or serovar are not specified by PCR, which is a direct approach for identifying leptospiral DNA. However, it is capable of identifying the Leptospira species. Blood, urine, cerebrospinal fluid, and different body tissues can all be tested with this method. PCR is the best method for evaluating blood and urine in cases of acute feline leptospirosis. Compared to culture, PCR yields quick results, enabling an early diagnosis (Hartskeerl et al. 2006). Because of their increased sensitivity and specificity, the method used in instantaneous PCR is strongly suggested. For the enhancement of precision of the method, genes with numerous copies in the genome, such as lig or rrs, are preferable when choosing genes for the test. Further increasing the test's specificity is the incorporation of genes that are only found in the pathogenic species (Bourhy et al. 2011).

9. TREATMENT

Animals with leptospirosis need supportive care, which includes giving intravenous fluids to correct fluid and electrolyte imbalances. Centrally acting antiemetics and parenteral gastric protector therapy may be beneficial for cats who develop concomitant renal failure. Proper pain treatment should be used to reduce discomfort, particularly in the early stages of the disease when gastrointestinal tissue, muscles, joints, and kidneys may swell and hurt (Schuller et al. 2015). In order to lower the danger of subsequent complications in cats with anorexia, enteral feeding tubes should be used until they regain the ability to feed on their own (Greene 2006).

9.1. ANTIMICROBIAL THERAPY

Ampicillin intravenously may be the recommended antibiotic during the stabilization stage. A 6-week regimen of oral suspension doxycycline has been recommended after the cat is stable to get rid of the carrier condition (Hartmann et al. 2013). For cats, doxycycline monohydrate is available as tablets or suspension and is a less irritant than the hyclate or hydrochloride forms. Doxycycline monohydrate tablets

should be given prior to a feast or a meal so the subsequent oesophagous inflammation can be prevented (Frowde et al. 2011; German et al. 2005).

10. PREVENTION

Animal and human vaccines have both been in use since the 1920s. Nearly every one of these vaccines was made from complete leptospiral cells that had been inactivated using a variety of techniques, including heat, formalin, phenol, and irradiation e.t.c. (Vincent et al. 2019). There isn't a cat-specific commercial vaccine in the market right now. However, experimental inoculation of cats with a commercial dog vaccination containing four separate serovars can result in the production of antibodies, albeit at lower titres than in vaccinated dogs (Shropshire et al. 2016). Cats can prevent infection most successfully by avoiding exposure in the absence of a vaccination. Cats housed indoors are less likely to develop the disease (Hartmann et al. 2013). As part of precautionary measures, it is advised to eliminate predatory possibilities and steer clear of standing water, animal urine, and canines at risk of developing clinical leptospirosis (Arbour et al. 2012; Mwachui et al. 2015; Ojeda et al. 2018). For a period of two weeks, cats who live in the same environment as an animal with a positive diagnosis can get doxycycline at a dosage of 5mg/kg or 10mg/kg PO once a day (Schuller et al. 2015; Sykes et al. 2011).

11. LEPTOSPIROSIS THE ZOONOSIS

Incidences of leptospirosis in humans vary considerably over the world, ranging from 0.1 to 1 case per 100,000 people per year in locations with temperate climates to over 10 cases per 100,000 people in humid sub-tropical areas. Over 100 instances per 100,000 people may get afflicted during outbreaks (Hartskeerl et al. 2011). Veterinarians, farmers, animal caregivers, animal researchers, and those who often come into touch with pet dogs or domestic cattle throughout their daily activities are just a few of the people who can get human leptospirosis (Langston and Heuter 2003). The majority of leptospiral infections in farmers, vets, abbatoir staff, and meat inspectors are contracted through close contact with diseased animals, which is a key risk factor (Barmettler et al. 2011). There isn't much evidence available on this subject, however pet ownership has been proposed as a potential risk factor for Leptospira infection. For instance, 10% of the 61 human leptospirosis cases reported between 1982 and 2001 in a research conducted in California, USA, had dogs as the source of their exposure (Meites et al. 2004). Despite the low seroprevalence of *L. interrogans* in cats, it is nevertheless a public health concern because of the possibility of cat-human interaction. This interaction creates a link between the environmental reservoir and human populations (Mosallanejad et al. 2011). Cats are just as likely as dogs to spread leptospirosis, according to the evidence. However, the practice of hiding their urine and the typical squatting posture they use when urinating could significantly diminish the organism's chances of long-term survival (Lomar et al. 2000). Domestic cats can still carry leptospirosis even in the absence of outward signs of the disease, such as chronic leptospiuria or high antibody titres. As a result, they ought to be considered possible sources of infection for both people and other domestic animals (Bonhomme and Werts 2022).

12. CONCLUSION

In conclusion, leptospirosis is a relatively rare but potentially serious bacterial infection that can affect cats. It is caused by various species of Leptospira bacteria and is typically transmitted through contact with contaminated water or soil, as well as exposure to infected animals or their urine. While cats are generally less susceptible to leptospirosis compared to other animals like dogs, they can still contract the disease and develop symptoms ranging from mild to severe. Symptoms of leptospirosis in cats can include fever, lethargy,

vomiting, diarrhea, muscle pain, jaundice (yellowing of the skin and eyes), and kidney or liver dysfunction. Diagnosing leptospirosis in cats can be challenging, as the symptoms can overlap with those of other illnesses. Laboratory tests, including serology and PCR, are often used to confirm the presence of the bacteria and determine the specific Leptospira causing the infection. Treatment of leptospirosis in cats typically involves antibiotics, such as doxycycline or ampicillin, along with supportive care to manage the symptoms and help the cat's immune system fight the infection. Early detection and treatment are crucial to improve the chances of a positive outcome. Prevention of leptospirosis in cats involves minimizing their exposure to potentially contaminated environments, ensuring proper hygiene, and avoiding contact with rodents and other animals that could carry the bacteria. Vaccines are available for dogs to protect against certain serovars of Leptospira, but vaccines for cats are less common and might not provide complete protection.

In summary, leptospirosis is a bacterial infection that can affect cats, though it is less common compared to other animals. Owners should be aware of the symptoms, take preventive measures, and seek veterinary care promptly if their cat shows signs of illness, as early intervention can greatly improve the prognosis.

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