International Journal of Medicine
pISSN 1468-3814 | eISSN 2667-7008
https://theinternationalmedicine.com/

Original Research Article *DOI: 10.61336/im/26-06-130*

PREVALENCE AND CLINICAL OUTCOMES OF LEPTOSPIROSIS IN PATIENTS PRESENTING WITH FEBRILE ILLNESS: A PROSPECTIVE OBSERVATIONAL STUDY

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Received: **May 11, 2026**
Revised: **May 25, 2026**
Accepted: **June 11, 2026**
Published: **June 23, 2026**

Abstract

Background: Leptospirosis is a widespread zoonotic infection and an important cause of acute febrile illness in tropical and subtropical countries. Due to its varied clinical presentation, the disease often remains under diagnosed, resulting in delayed treatment and adverse outcomes. ***Objective:*** To determine the prevalence, demographic profile, risk factors, clinical manifestations, and outcomes of leptospirosis among patients presenting with febrile illness. ***Materials and Methods:*** This hospital-based observational study was conducted in the Department of Medicine, MGM Medical College and M.Y. Hospital, Indore. A total of 130 adult patients presenting with acute febrile illness were enrolled over a period of one year. All participants underwent detailed clinical evaluation and laboratory investigations, including Leptospira IgM antibody testing. Data were analyzed using SPSS version 25.0. Descriptive statistics were expressed as frequencies and percentages. ***Results:*** Among 130 patients with febrile illness, 11 patients were diagnosed with leptospirosis, giving a prevalence of 8.5%. Males constituted 90.9% of cases. The most commonly affected age groups were 18–30 years and 46–60 years (36.4% each). Exposure to domesticated livestock and travel to endemic areas were observed in 54.5% of cases, while all affected patients belonged to a low socioeconomic background. Fever was present in all patients, followed by myalgia (90.9%), abdominal pain (81.8%), nausea/vomiting (81.8%), and rigors (72.7%). Conjunctival suffusion was the most common examination finding (63.6%). Most patients (90.9%) recovered without complications, while mortality was observed in one patient (9.1%). ***Conclusion:*** Leptospirosis remains an important cause of acute febrile illness in endemic regions. Male gender, low socioeconomic status, livestock exposure, and travel to endemic areas were important associated factors. Early diagnosis and prompt treatment are essential for reducing disease-related morbidity and mortality.

Keywords: Leptospirosis; Acute Febrile Illness; Seroprevalence; Clinical Outcomes; Leptospira IgM; Zoonotic Infection

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INTRODUCTION

Leptospirosis is a globally important zoonotic disease caused by pathogenic spirochetes of the genus Leptospira. The disease is transmitted to humans through direct or indirect contact with urine from infected animals, particularly rodents, cattle, pigs, and dogs. Human infection commonly occurs through exposure to contaminated water or soil, especially in tropical and subtropical regions where environmental conditions favor bacterial survival [1]. The global burden of leptospirosis remains substantial, with more than one million severe cases and approximately 60,000 deaths estimated annually. The disease disproportionately affects low- and middle-income countries where inadequate sanitation, occupational exposure, and climatic factors increase the risk of transmission [2]. Clinical manifestations range from a mild self-limiting febrile illness to severe life-threatening disease characterized by jaundice, acute kidney injury, pulmonary hemorrhage, myocarditis, and multiorgan dysfunction. Because its presentation overlaps with other tropical infections such as dengue, malaria, typhoid fever, and scrub typhus, leptospirosis frequently remains underdiagnosed [3]. Recent epidemiological studies have highlighted the increasing recognition of leptospirosis as a significant contributor to acute undifferentiated febrile illness. Early identification is particularly important because timely antibiotic therapy can significantly reduce disease severity and improve outcomes [4]. India continues to report a considerable burden of leptospirosis, especially during monsoon seasons and in regions characterized by poor sanitation, agricultural activity, and close human-animal

interaction. Despite its public health importance, data regarding prevalence and clinical outcomes among hospitalized patients with febrile illness remain limited in several parts of central India [5]. Understanding the epidemiological and clinical characteristics of leptospirosis is essential for improving diagnostic suspicion and optimizing patient management [6].

Therefore, the present study was undertaken to determine the prevalence and clinical outcomes of leptospirosis among patients presenting with febrile illness in a tertiary care centre

MATERIALS AND METHODS

This hospital-based observational study was conducted in the Department of Medicine, MGM Medical College and M.Y. Hospital, Indore. A total of 130 adult patients admitted with acute febrile illness were enrolled in the study. The sample size was calculated using the Cochran formula at a 95% confidence level, considering an expected prevalence of 9.5% and a margin of error of 5%, which yielded a required sample size of 130 participants.

Inclusion Criteria

- Patients aged ≥18 years.
- Admitted cases of febrile illness (fever >37.5°C for more than 2 days without an established source of infection).
- Patients willing to provide written informed consent.

Exclusion Criteria

- Patients with chronic febrile illnesses such as tuberculosis and neoplastic disorders.
- Patients unwilling or unable to provide informed consent.

Data Collection

After obtaining written informed consent, demographic details, socioeconomic status, risk factors, clinical history, and examination findings were recorded using a predesigned semi-structured questionnaire. Relevant clinical and laboratory data were collected from patient records.

Laboratory Investigations

All patients underwent routine investigations including complete blood count, liver function tests, renal function tests, serum electrolytes, ESR, CRP, ferritin, D-dimer, fibrinogen, Widal test, dengue serology, peripheral smear for malarial parasite, and Leptospira IgM antibody testing. Radiological investigations included chest radiography and ultrasonography of the abdomen whenever indicated.

Statistical Analysis

Data were analyzed using SPSS version 25.0. Continuous variables were summarized as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages.

RESULTS

A total of 130 patients presenting with acute febrile illness were evaluated for leptospirosis. Among them, 11 patients were found positive for Leptospira IgM antibodies.

Table 1: Prevalence of Leptospirosis based on Serological Results

Leptospirosis	Frequency (n)	Percentage (%)
Present	11	8.5
Absent	119	91.5

The prevalence of leptospirosis among patients presenting with febrile illness was 8.5% (11/130), while 91.5% of patients tested negative for Leptospira IgM antibodies. This finding indicates that leptospirosis represents an important etiological cause of acute febrile illness in the study population.

Table 2: Distribution of patients with Leptospirosis according to Age and Gender (n = 11)

		Frequency (n)	Percentage (%)
Age in Years	18 to 30	04	36.4
	31 to 45	03	27.2
	46 to 60	04	36.4
Gender	Male	10	90.9
	Female	1	9.1

Among the 11 confirmed cases of leptospirosis, the highest proportion of patients belonged to the age groups of 18–30 years and 46–60 years (36.4% each), followed by 31–45 years (27.2%). A marked male predominance was observed, with males accounting for 90.9% of cases, whereas females constituted only 9.1%.

All patients with leptospirosis belonged to a low socioeconomic background. Exposure to domesticated livestock and travel to endemic areas were reported by 54.5% of patients each, while rodent infestation was identified in 18.3% of cases. These findings suggest the importance of environmental and occupational exposure in disease transmission.

Table 3: Distribution of patients with Leptospirosis according to Risk factors related to Leptospirosis (n = 11)

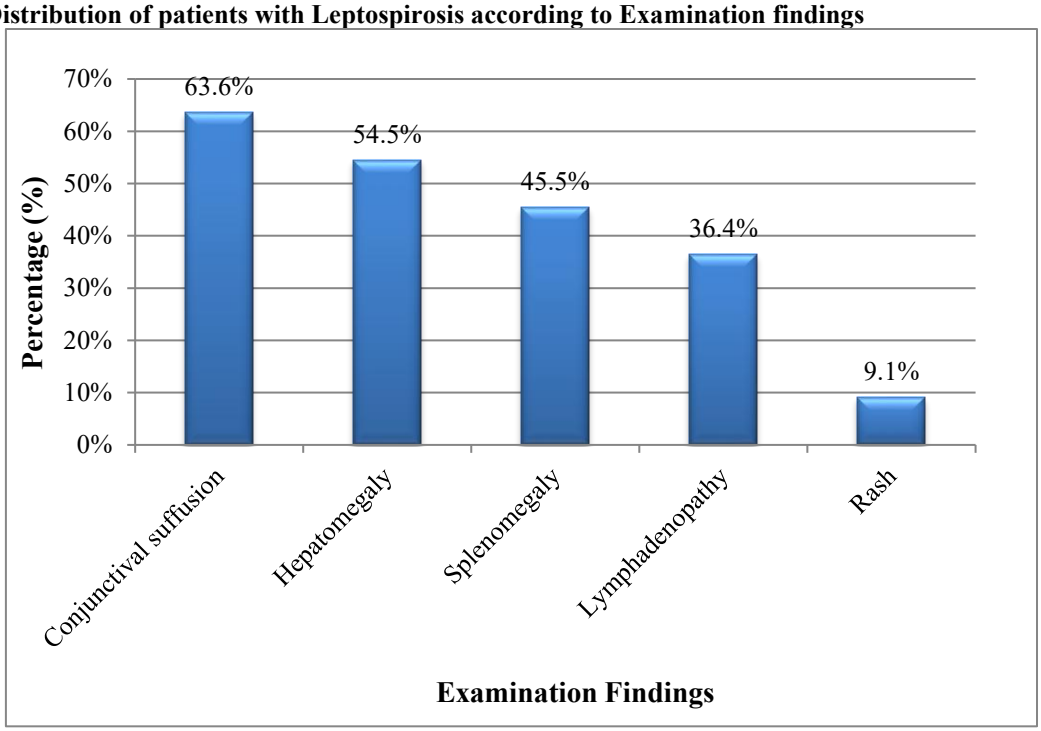
Risk factors related to Leptospirosis		Frequency (n)	Percentage (%)
Household exposure	Domesticated livestock	06	54.5
	Infestation by rodents	02	18.3
	No	03	27.2
Low Socioeconomic status	Yes	11	100
	No	0	0
Travel to endemic areas	Yes	06	54.5
	No	05	45.5

Table 4: Distribution of patients with Leptospirosis according to Symptoms (n = 11)

Symptoms	Frequency (n)	Percentage (%)
Fever	11	100
Myalgia	10	90.9
Abdominal pain	09	81.8
Nausea/vomiting	09	81.8
Rigors	08	72.7
Non-productive cough	07	63.6
Jaundice	06	54.5
Arthralgia	05	45.5
Pain & redness of eyes	05	45.5
Headache	03	27.2
Diarrhoea	03	27.2
Shortness of breath	03	27.2
Sore throat	01	9.1

Fever was the universal presenting symptom, observed in all patients (100%). Myalgia was present in 90.9% of cases, followed by abdominal pain and nausea/vomiting (81.8% each). Rigors were observed in 72.7% of patients, while non-productive cough and jaundice were reported in 63.6% and 54.5% of cases, respectively. These findings demonstrate the multisystem and nonspecific clinical presentation of leptospirosis.

Figure 1: Distribution of patients with Leptospirosis according to Examination findings



Clinical examination revealed conjunctival suffusion as the most common finding (63.6%), followed by hepatomegaly (54.5%), splenomegaly (45.5%), and lymphadenopathy (36.4%). Rash was observed in only 9.1% of patients. The predominance of conjunctival suffusion highlights its value as an important clinical clue in suspected leptospirosis.

Table 5: Distribution of patients with Leptospirosis according to Outcome (n = 11)

Outcome	Frequency (n)	Percentage (%)
Discharged without complications	10	90.9
Died	01	9.1

The majority of patients (90.9%) recovered and was discharged without complications. Mortality was recorded in one patient (9.1%). Overall, favorable clinical outcomes were observed in most patients following appropriate management.

DISCUSSION

In the present study, leptospirosis was detected in 8.5% of patients presenting with acute febrile illness. This finding confirms that leptospirosis remains an important but frequently overlooked cause of fever in endemic regions. The prevalence of 8.5% observed in the present study is comparable to reports from other hospital-based studies conducted in endemic regions of India, highlighting the continued contribution of leptospirosis to the burden of acute febrile illness. Similar studies have reported variable prevalence rates depending on geographical location, climatic conditions, and diagnostic methods employed [5].

A marked male predominance was observed, with males accounting for 90.9% of confirmed cases. Leptospirosis continues to be a neglected tropical zoonosis, and higher disease occurrence among males has been attributed to increased occupational and environmental exposure in endemic settings [7].

The majority of affected individuals belonged to the productive adult age groups. This pattern has been documented in previous epidemiological studies and reflects increased outdoor activity and occupational exposure among economically active individuals [8].

Risk factor analysis demonstrated that all affected patients belonged to a low socioeconomic background. Exposure to domesticated livestock and travel to endemic areas were also frequently observed. These findings support the established role of environmental and socioeconomic determinants in the transmission of leptospirosis [9].

Fever and myalgia were the most common symptoms observed in the present study, followed by gastrointestinal manifestations such as abdominal pain and vomiting. Similar clinical patterns have been reported by previous investigators, emphasizing the nonspecific nature of leptospirosis and the diagnostic challenge it presents [3].

Conjunctival suffusion emerged as the most common clinical examination finding in the present study. This sign is regarded as a characteristic feature of leptospirosis and has been consistently reported as an important clinical clue that facilitates early diagnosis [10].

The clinical outcome was favorable in the majority of patients, with more than 90% recovering without complications. Mortality was observed in only one patient. Previous studies have shown that mortality is largely related to delayed diagnosis, acute kidney injury, pulmonary involvement, and multiorgan dysfunction. Early recognition and prompt initiation of antimicrobial therapy remain critical determinants of outcome [11].

Overall, the findings of the present study reinforce the need for increased clinical suspicion of leptospirosis in patients presenting with acute febrile illness, particularly in endemic settings and among individuals with identifiable environmental risk factors.

CONCLUSION

Leptospirosis accounted for 8.5% of acute febrile illness cases in the present study, confirming its continued clinical significance in endemic regions. The disease predominantly affected adult males from lower socioeconomic backgrounds and was strongly associated with livestock exposure and travel to endemic areas. Fever, myalgia, gastrointestinal symptoms, and conjunctival suffusion were the most frequent clinical manifestations. Although the majority of patients experienced favorable outcomes, mortality was observed in a small proportion of cases, highlighting the potentially severe nature of the disease. Early clinical suspicion, timely serological diagnosis, and prompt treatment are essential for reducing morbidity and mortality associated with leptospirosis.

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