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# Seroprevelance Of Leptospirosis In Tertiary Care Hospital, Guntur, Andhra Pradesh.

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***Abstract:***
***Introduction:*** *Leptospirosis is one of the most important zoonotic bacterial infections worldwide. It most commonly affects agricultural workers, sewage workers, animal handlers and butchers resulting in significant morbidity and mortality. The infection is estimated to cause one million cases and around 58,900 deaths annually in world, with a case fatality ratio of 6.85%. In 1886, Adolph Weil first described leptospirosis as a febrile illness characterized by icterus, enlarged spleen, renal failure, and conjunctivitis, particularly affecting individuals with outdoor occupations who came into contact with water. The severe form was named 'Weil's disease'. Stimson demonstrated the presence of spirochaetes in the kidneys of a patient who died from the disease, and the organism was named Spirochaeta interrogans because of its question-mark shape. It is usually enter the body via cuts or abrasions in the skin. Pathogenic leptospires invade the bloodstream after penetrating skin or mucous membranes. Microbiological diagnosis of leptospirosis aims at demonstrating the leptospiral antigens or by demonstrating an appreciable antibody response to them. AIM-To determine seroprevalance of IgM antibody to leptospira in patients suffering from acute febrile illness and to study their age and gender.*
***Materials & Methods-*** *The present study is a prospective observational study was conducted since November 2023 –April 2024 (6months), Department of Microbiology, Guntur medical college, Guntur. A total of 698 samples were collected and tested for Leptospira IgM antibodies using the RecombiLlSA Leptospira IgM ELISA kit.*
***Results-*** *Out of 698 samples 83 were detected IgM antibodies by elisa, in that males were 39(46.98%) and females were 44(53.01%),age group mostly involved were below 20 years. CONCLUSION-Leptospirosis is a treatable disease commonly seen in low income and developing nations. The clinical manifestations and the severity of the disease are highly variable. Efficient diagnostic tests and clinical laboratory parameters have been established to confirm the presence of the disease.*

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## I. Introduction

Leptospirosis is an emerging and neglected tropical zoonotic disease caused by pathogenic spirochetes of the genus Leptospira.It is considered one of the most widespread zoonoses globally, with a significant public health burden in developing countries, particularly in regions with tropical and subtropical climates[1,2].

The disease is transmitted to humans through direct contact with the urine of infected animals or indirectly via contaminated water and soil. Rodents, particularly rats, serve as the primary reservoir hosts, although other domestic and wild animals may also act as carriers[3].

Environmental conditions such as heavy rainfall, flooding, poor sanitation, and inadequate drainage systems create ideal circumstances for the proliferation and transmission of leptospires, especially in agricultural and urban slum settings[4].

In India, leptospirosis is endemic in several states including Tamil Nadu, Kerala, Gujarat, Maharashtra, and parts of Andhra Pradesh, where outbreaks are frequently reported following the monsoon season[5,6].

The clinical manifestations of leptospirosis are highly variable, ranging from subclinical infection to severe multi-organ dysfunction.

The illness often begins abruptly with a febrile phase that includes symptoms such as fever, chills, myalgia (especially in the calves and lower back), headache, conjunctival suffusion, and gastrointestinal disturbances[7].

In many cases, this acute febrile illness is self-limiting; however, a significant proportion of patients may progress to a more severe, immune-mediated second phase.

This can involve hepatic dysfunction (jaundice), acute kidney injury, pulmonary hemorrhagic syndrome, myocarditis, meningitis, and septic shock—a condition historically referred to as Weil's disease[8].

One of the key challenges in the clinical diagnosis of leptospirosis is its nonspecific presentation, which overlaps significantly with other endemic febrile illnesses such as malaria, dengue, typhoid fever, chikungunya, and rickettsial infections[9].

Laboratory confirmation is crucial but often delayed or unavailable, especially in resource-limited settings. Although molecular diagnostics such as PCR offer early detection, serological tests like the Microscopic Agglutination Test (MAT) and ELISA-based IgM antibody detection remain the most widely used methods for diagnosis due to their practicality[10].

Despite its public health importance, leptospirosis remains grossly underdiagnosed and underreported in India.

The lack of awareness among clinicians, insufficient laboratory capacity, and the absence of systematic surveillance have contributed to the gap in understanding the actual burden of disease. Regional seroprevalence studies are essential to estimate true disease incidence, identify at-risk populations, and strengthen diagnostic and preventive strategies.

Guntur, a major district in Andhra Pradesh, has a predominantly agrarian population and experiences substantial rainfall during the monsoon season—conditions that favor leptospiral transmission.

However, there is limited data on the seroprevalence of leptospirosis in this region. Hospital-based studies can provide valuable epidemiological insights and improve early clinical recognition and management.

## II. Materials & Methods:

This study was prospective observational study, study performed at state vrdl at department of microbiology, guntur medical college/government general hospital, guntur from November 2024 to April 2025. Permission taken from institutional ethics committee.

All the patients attending the outpatient department and in patients suspected with acute febrile illness were included in the study. Exclusion criteria was confirmed cases for other febrile illnesses like malaria, typhoid, dengue, chikungunya, leptospirosis.

Five ml of venous blood was collected in a plain vial without anticoagulant and serum was separated after centrifugation at 3,000 rpm for 5 min. this serum was used for further testing by elisa for igm antibodies.

Leptospira igm microlisa method

Kit presentation:* 96 well ELISA KIT.

Principal:

The Recombilisa leptospira IgM ELISA is a solid phase enzyme linked immunosorbent assay based on the principle of the indirect immunoassay technique for the qualitative detection of IgM anti-L.interrogans in human serum or plasma.

The recombilisa leptospira IgM ELISA is composed of two key components:

1.Solid microwells pre-coated with L. interrogans antigen

2.Liquid conjugates composed of monoclonal anti-human IgM reagent conjugated with horseradish peroxidase (HRP-anti-human IgM Conjugate)

During the assay the test specimen is first incubated with the coated microwells.the anti-L interrogans IgM, if present in the specimen, binds to the antigen coated on the microwell surface and any unbound specimen is then removed by a wash step.

In the second incubation with the HRP-anti-human IgM Conjugate,the anti L.interrogans IgM antibody adsorbed on the surface of the microwells bind to the anti- human IgM in the HRP conjugate, forming a conjugate complex.

Unbound conjugate is then removed by washing. TMB substrate is then added to the microwells and the presence of the conjugate complex is shown by blue colour resulting from the reaction between the enzyme and substrate.

The reaction is then quenched upon addition of the stop solution and the absorbance value for each microwell is determined using a spectrophotometer at 450/620-690 nm.

## III. Results:

Table-1

The above table showing total samples tested in the study period was 698, Positives were 83 (11.89%) and negatives were 615(88.10%).

Table-2
The above table shows total positives were 83 (11.89%) out of 698 samples,out of 83 positives, males were 39(46.98%) and females were 44(53.01%).

Table -3
Age Distribution

This table shows out of 83 positive cases 50.68% of age group effected were below 20 years, followed by 26.50% were 21-40 yrs age group,19.27% were 41-60 yrs and 3.6% were 61 to 80yrs age group effected.

## IV. Discussion:

Leptospirosis is a bacterial zoonosis caused by pathogenic species of the genus Leptospira, which are thin, spiral-shaped, motile spirochetes. The genus contains both pathogenic and non-pathogenic strains, with Leptospira interrogans being the most commonly implicated in human infections.

Out of 698 samples, 83(11.89%) samples were tested positive for leptospirosis and 615(88.10%) samples were negative.

The study done by baveja et.al from pune showed highest prevalence of 19.78% where as mythily et.al coimbatore reported prevalence of 10.9% which corresponds with the present study 11.8%.

The present study showed that the age group most affected was below 20 years, whereas studies conducted by Baveja et al. from Pune, Mythily et al. from Coimbatore, Divya Choudhary et al. from Haryana, and Rashmi et al. from Solapur found that the 21-30 years age group was more commonly affected.

The present study showed female predominance of 53% which corresponds with baveja et.al with 66%. where as Mythily et.al.divya choudhary et.al showed male predominance of 70% and 65% respectively.

## V. Conclusion:

Leptospirosis continues to be a significant but often overlooked cause of acute febrile illness, particularly in tropical regions like Andhra Pradesh where environmental and occupational risk factors are prevalent.

Our study, conducted at a tertiary care hospital in Guntur over a six-month period, highlights a considerable seroprevalence of leptospirosis among patients presenting with non-specific febrile symptoms. The clinical manifestations observed—ranging from mild flu-like illness to severe complications—underscore the diverse and potentially fatal nature of the disease if not recognized and managed promptly.

Given the substantial overlap of clinical features with other endemic infections such as dengue, malaria, and typhoid, there is a pressing need to increase clinician awareness and to include leptospirosis in the differential diagnosis of acute febrile illnesses, especially during and after the monsoon season. Laboratory capacity for early and accurate diagnosis should be strengthened through the availability of rapid serological tests and, where feasible, molecular assays.

This study reinforces the importance of regional serosurveillance and supports the integration of leptospirosis into routine public health monitoring frameworks. Public education, environmental sanitation, occupational safety measures, and targeted prophylaxis during high-risk periods can play a pivotal role in reducing disease transmission and burden. Future research should focus on long-term surveillance, genotypic characterization of circulating Leptospira strains, and evaluating the impact of preventive interventions at the community level.

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## Graphs

Figure 1: Sex distribution of Leptospira IgM positive cases

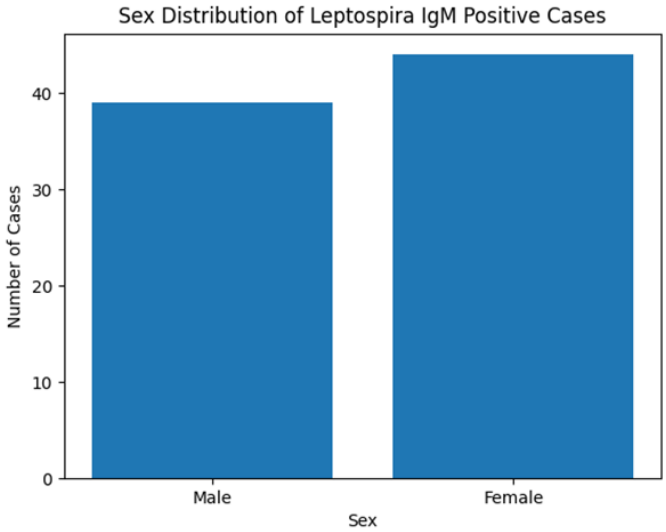
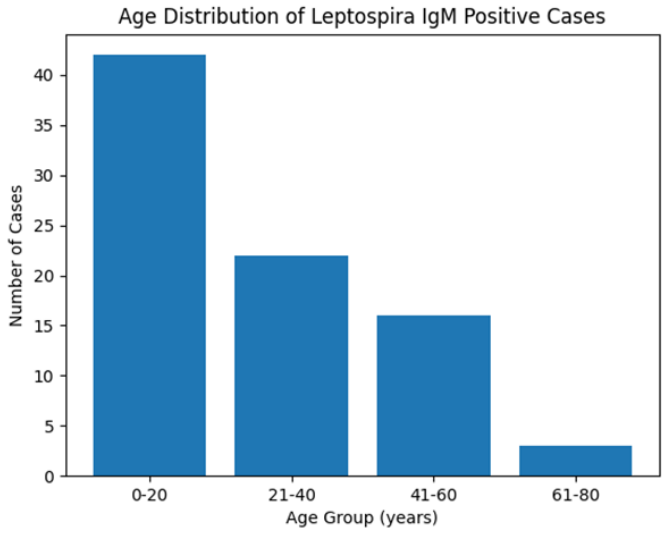



Figure 2: Age distribution of Leptospira IgM positive cases




## Tables

Table 1: Overall seropositivity of Leptospira IgM antibodies

| Total samples tested | Total positives (%) | Total negatives (%) |
|---|---|---|
| 698 | 83 (11.89%) | 615 (88.10%) |

Table 2: Sex-wise distribution of Leptospira IgM positive cases

| Sex | Number | Percentage |
|---|---|---|
| Male | 39 | 46.98% |
| Female | 44 | 53.01% |

Table 3: Age-wise distribution of Leptospira IgM positive cases

| Age group (years) | Number | Percentage |
|---|---|---|
| 0–20 | 42 | 50.68% |
| 21–40 | 22 | 26.50% |
| 41–60 | 16 | 19.27% |
| 61–80 | 3 | 3.6% |