



ORIGINAL RESEARCH PAPER

Clinical Microbiology

FREQUENCY OF LEPTOSPIROSIS IN NORTHERN INDIA : A STUDY FROM TERTIARY CARE HOSPITAL OF SUB HIMALAYAN REGION.

KEY WORDS: Anthropo-zoonotic, IgM ELISA, MAT

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ABSTRACT

Background : Leptospirosis is an acute anthropo-zoonotic infection with multiple system involvement, caused by pathogenic strains of *Leptospira interrogans*. It can be associated with fatal consequences and has been a under-reported disease in India. **Objective:** This study is aimed at determining the frequency of leptospirosis among patients of all age groups. **Methods:** Retrospective data of IgM ELISA for leptospirosis was retrieved for analysis. Serum samples were collected and processed for IgM ELISA. A total of 1087 serum samples were received over a period of one year from April 2022 to March 2023 for IgM ELISA for leptospirosis. **Results:** Leptospirosis was diagnosed in 159 (14.63%) patients and majority of them were observed between July to September with slight female predominance, male to female ratio of 1:1.1.

INTRODUCTION

In 1886, Weil, Professor of Medicine at Heidelberg describe the leptospirosis caused by *Leptospira interrogans*. Noguchi, in 1918 proposed the name *Leptospira*, on basis of his detailed cultural and microscopic observations.

Leptospirosis is a zoonotic worldwide and is associated with complications as well as with mortality. Since 1931, it has been recognized in India especially in costal areas with heavy monsoon, contact with animals and rural farm workers. An acute febrile illness caused by pathogenic spirochetes, *Leptospira interrogans* with symptoms ranging from mild sub-clinical illness, in majority of cases to severe complications in small proportion of patients with multi-organ involvement. Mild cases can be acute febrile icteric and anicteric illness while severe manifestations include renal involvement, liver impairment, haemorrhagic pneumonitis, respiratory distress syndrome, neuroleptospirosis and disseminated intravascular coagulation.

MATERIAL AND METHODS

The retrospective study was conducted in department of Microbiology, Dr.RPGMC Kangra at Tanda H.P. over a period of one year w.e.f. April 2022 to March 2023. The serum samples were tested by using ELISA IgM test (Recombilisa IgM ELISA kit) as it has higher sensitivity and specificity.

RESULTS :

- A total of 1087 serum samples with suspected leptospirosis were received w.e.f. April 2022 to March 2023.
- In 1087 samples, 565 (51.98%) were males and 522 (48.02%) were females.
- Maximum samples (74.8%) were from district Kangra.
- Out of 1087 samples, 159 (14.63%) were positive for IgM leptospirosis while 909 (83.6%) were negative and 19 samples (1.75%) were reported equivocal.
- Out of 159 IgM positive samples, 76 (47.80%) were males and 83 (52.20%) were females.

2.	Chamba	92	08.46
3.	Hamirpur	78	07.17
4.	Mandi	58	05.33
5.	Una	21	01.93
6.	Bilaspur	14	01.29
7.	Solan	02	00.18
8.	Sirmour	01	00.09
9.	Others (Punjab/ other states)	08	00.75

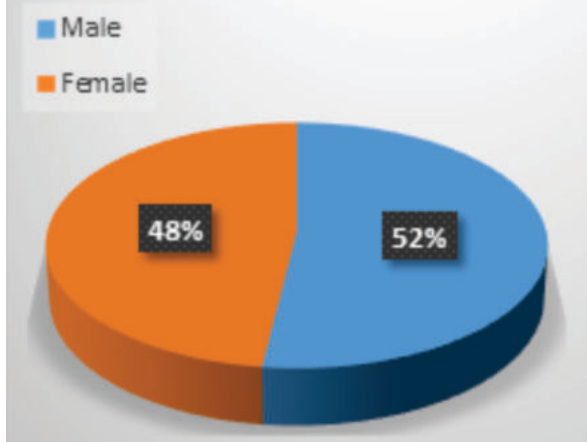


Figure 1 : Sex-wise distribution of serum samples.

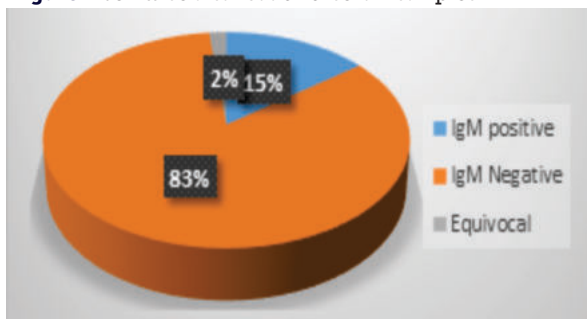


Figure 2 : IgM ELISA test results.

Table 1 : District wise distribution of samples

Serial No:	District	Number	Percentage (%)
1.	Kangra	813	74.8

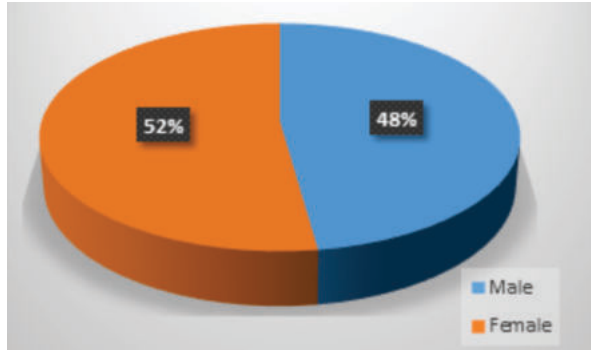


Figure 3 : IgM ELISA positive samples: sex-wise distribution

1. Edward A., Hodder, Staughton. Leptospirosis. Quoted in Topley and Wilson's Principles of Bacteriology, Virology and Immunity. 8th edn. Vol. 3, 619, 1990.
2. Noguchi H. The spirochaetes, in the newer knowledge of bacteriology and immunology, Jordan EO and Falk IS. University of Chicago Press, Chicago, 1928;462-97.
3. Sehgal SC (2006) Epidemiological patterns in leptospirosis. Indian J Med Microbiol 24:310-311.
4. Sethi S, Sood A, Pooja, Sharma S, Sengupta C, et al. (2003) Leptospirosis in northern India: a clinical and serological study. Southeast Asian J Trop Med Public Health 34: 822-825.
5. Rao P, Sethi S, Sud A, Banga SS, Sharma M (2005) Screening of patients with acute febrile illness for leptospirosis using clinical criteria and serology. Natl Med J India 18: 244-246.
6. Sagar V, Berry V (2008) Increasing seropositivity of leptospirosis in a medical college in Ludhiana. Indian J Public Health 52: 50.
7. Manocha H, Ghoshal U, Singh SK, Kishore J, Ayyagari A (2004) Frequency of leptospirosis in patients of acute febrile illness in Uttar Pradesh. J Assoc Physicians India 52: 623-5.
8. Gupta N, Rao RS, Bhalla P, Agarwal SK (2004) Seroprevalence of leptospirosis in Delhi using indirect haemagglutination assay. Indian J Med Microbiol 22: 134-135.

DISCUSSION

- *Leptospira* organism require humid weather conditions for survival; domestic animals and rats harbour *Leptospira* and shed it in urine, help in transmission . A close contact with rodents or domestic farm animals, contaminated water during rainy season, wet rice fields can lead to leptospirosis. The cases are higher during and after rainy season.
- Although North India receives less rainfall compared from coastal regions but a large number of people depends on agriculture. Thus close contact with domestic animals, unprotected entry into water logged rice fields, presence of rodents in fields and even taking bath in contaminated pond water³ can expose a person to *Leptospira* infection.
- Previous reports from New Delhi, Chandigarh, Punjab and Uttar Pradesh^{4,5,6,7,8} point to the fact of prevalence of *Leptospira* infection in North India.
- Slight female predominance with male to female ratio of 1:1.1 was seen in this study may be due to more involvement of females in farms and domestic animals care activities.
- As this study was conducted in a tertiary care hospital situated in Kangra district, therefore most cases were from this district due to easy availability of diagnostic facilities.

CONCLUSION

1. Presence of farm animals, farmland and wet rainy climatic conditions in rural setting help in survival and transmission of leptospirosis.
2. A history of contact with animals or working in wet rice fields is important.
3. Rise in cases of leptospirosis in North India was documented now more frequently due to increased availability of diagnostic facilities and increased awareness among physician.
4. An early diagnosis is mandatory as effective and specific therapy is available which help in reducing morbidity and mortality associated with the disease.
5. In India, Micro-agglutination test (MAT) is performed only in reference laboratories, so IgM ELISA is preferred in most laboratories for diagnosis of leptospirosis.

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REFERENCES: