

# A Study on Clinical Profile of Patients with Leptospirosis

T. Sreenivasulu<sup>1</sup>, M. Nagamallika<sup>1</sup>, C. Mallikarjuna Reddy<sup>2</sup>

## ABSTRACT

**Introduction:** Leptospirosis is a spirochetal infection with bacteria of the genus leptospira, the severe icteric form of infection is called Weil's disease. After investigator who in 1886 described four men with an acute but self limited infectious illness characterized by fever, jaundice, nephritis and hepatomegaly and a biphasic course, with fever recurring 1 to 7 days into convalescence. Objective of the study was to study clinical profile of patients with leptospirosis

**Material and Methods:** A Hospital based cross sectional study was conducted for a period of two years. A pre designed pre tested semi structured questionnaire was used for collection of the data. Detailed history especially related to leptospirosis symptoms was collected from each and every patient. All patients underwent investigations like hemoglobin, complete blood count and ESR. The data was simply entered in the Microsoft Excel sheet and analyzed using percentages. The difference in the proportions was tested using the chi square test. The p value less than 0.5 was considered statistically significant.

**Results:** In the present study, there were 38 males and 12 females and sex ration was 3.2:1. The most common presenting symptoms were fever in 100%, followed by myalgia 44 patients (88%), vomiting 33 patients (66%), headache 30 patients (60%). Most of the patients are seen with hepatomegaly i.e. 42 patients (84%), splenomegaly 29 patients (58%), icterus 25 patients (50%), sub conjunctival congestion 15 patients (30%) and pallor 14 patients (28%).

**Conclusion:** Leptospirosis was more common in agriculturists. Males were more affected. Fever was the commonest symptom at presentation. Majority of the patients presented with myalgia, jaundice and headache. 14% of the patients presented with bleeding manifestation and 30% had conjunctival suffusion.

**Keywords:** Jaundice, Leptospirosis, Fever

## INTRODUCTION

Leptospirosis is a spirochetal infection with bacteria of the genus leptospira, the severe icteric form of infection is called Weil's disease. After investigator who in 1886 described four men with an acute but self limited infectious illness characterized by fever, jaundice, nephritis and hepatomegaly and a biphasic course, with fever recurring 1 to 7 days into convalescence. Infected animals and upon excretion in uring survives in the environment for as long as 6 months.<sup>1</sup>

The optimal temperature for growth is 28-32 degree C. Human becomes infected through recreational (e.g. windsurfing, kayaking, and swimming) or occupational exposures to animal urine or urine contaminated water and soil.<sup>2</sup> Leptospirosis is up to 10 times more frequent in rural than in urban dwellers and three times more frequent in men with a peak incidence in men at the age of 30 – 39.<sup>3</sup>

An estimated 10% of patients will present with jaundice, hemorrhage, renal failure and/or neurological dysfunction

(weil's disease). Signs of leptospirosis include fever of 38-40°C (97-100% of patients), conjunctival suffusion (25-40%), abdominal tenderness (5-30%), muscle tenderness (40-80%), meningeal signs (12-40%), disturbances in sensorium (50% of icteric cases), jaundice (10%), and a truncal rash that can be macular, urticarial or purpuric (7-9%). Pretibial, raised, 1-5 cm erythematous lesions are seen characteristically in a form of leptospirosis called "fort bragg fever".<sup>4</sup>

Leptospirosis may present as an acute influenza like illness with fever, chills, severe headache, nausea, vomiting and myalgias, muscle pain, which especially affects the calves, back and abdomen, is an important feature of leptospiral infection.<sup>5</sup>

Less common features include sore throat and rash. The patient usually has an intense headache (frontal or retro orbital) and sometimes develops photophobia, mental confusion may be evident. Pulmonary involvement manifested in most cases by cough and chest pain and in a few cases by hemoptysis, is not uncommon.<sup>6</sup>

Hence present study has been undertaken to study the clinical profile of patients with leptospirosis.

## MATERIAL AND METHODS

Hospital based cross sectional study was conducted for the period of two years with sample size of 50 patients with fever. Ethical issues: Institutional Ethics Committee permission was taken before the study initiation. All included patients were asked for an informed consent.

Collection of data: A pre designed pre tested semi structured questionnaire was used for collection of the data. Detailed history especially related to leptospirosis symptoms was collected from each and every patient.

Diagnosed patients with leptospirosis were included in the study. Those who do not consent for the study were not included and patients with any serious complications or adverse reactions were also not included in the present study.

Investigations: All patients underwent investigations like hemoglobin, complete blood count and ESR.

## STATISTICAL ANALYSIS

The data was simply entered in the Microsoft Excel sheet and analyzed using percentages. The difference in the pro-

<sup>1</sup>Associate Professor, Department of General Medicine, <sup>2</sup>Assistant Professor, Department of Microbiology, Malla Reddy Medical College for Women, Hyderabad, India

**Corresponding author:** Dr. T. Sreenivasulu, Associate Professor, Department of General Medicine, Malla Reddy Institute of Medical Sciences, Hyderabad, India

**How to cite this article:** T. Sreenivasulu, M. Nagamallika, C. Mallikarjuna Reddy. A study on clinical profile of patients with leptospirosis. International Journal of Contemporary Medical Research 2016;3(3):826-828.

Age (years)	Male		Female		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
0-20	2	5.3	0	0	2	4
21-30	10	26.3	2	16.7	12	24
31-40	12	31.6	5	41.7	17	34
41-50	10	26.3	4	33.3	14	28
> 50	4	10.5	1	8.3	5	10
Total	38	100	12	100	50	100

$X^2 = 0.169, p < 0.833$  (NS)

**Table-1:** Age and sex distribution of the study subjects

portions was tested using the chi square test. The p value less than 0.5 was considered statistically significant.

## RESULTS

In the present study, there were 38 males and 12 females and sex ration was 3.2:1.

It can be observed that maximum number of males i.e. 31.6% were in the age group of 31-40 years followed by 21-30 (26.3%), 41-50 (26.3%) and minimum were in the age group of below 20 years (5.3%).

Among females, the maximum 41.7% were in the age group of 31-40 years followed by 41-50 years (33.3%) and minimum in the age group of below 20 years.

In the present study, the most common presenting symptoms were fever in 100%, followed by myalgia 44 patients (88%), vomiting 33 patients (66%), headache 30 patients (60%), arthralgia 29 patients (58%), jaundice 27 patients (54%), and oliguria 16 patients (32%).

Most of the patients are seen with hepatomegaly i.e. 42 patients (84%), splenomegaly 29 patients (58%), icterus 25 patients (50%), sub conjunctival congestion 15 patients (30%) and pallor 14 patients (28%).

Among 50 patients, 7 patients (14%) developed hypotension. Systolic blood pressure was below 90 mmHg. Diastolic blood pressure was below 60 mmHg with cold and clammy peripheries. 3 patients (6%) developed acute respiratory distress syndrome.

Among 50 patients 2 patients (4%) developed congestive cardiac failure because of myocarditis. 2 patients (4%) developed altered sensorium.

In the present study out of 50 patients 22 patients (44%) had anemia with hemoglobin level below 11 gm%, 4 patients (8%) had hemoglobin level less than 7 gm%, 13 patients (26%) had hemoglobin level 7.1 – 10 gm%, 5 patients (10%) had hemoglobin level 10.1 to 11 gm%. Among 22 patients, 4 patients received blood transfusion, 18 patients were treated through oral medication.

Out of 50 patients, 9 patients (18%) had leucopenia (total leucocyte count less than 4500) and 13 patients (26%) had leucocytosis (total leucocyte count more than 11500). In this study minimum total leucocyte count was 2600 and maximum was 20,000.

Out of 50 patients 26 patients (52%) had high ESR. In this study, highest ESR recorded was 140.

## DISCUSSION

Since there is a steady increase in cases of leptospirosis the aim of the present study was to study the clinical profile of

Symptom	Present	%	P value	Inference
Fever	50	100	< 0.05	H.S.
Headache	30	60	< 0.05	S
Vomiting	33	66	< 0.05	S
Myalgia	44	88	< 0.05	H.S.
Arthralgia	29	58	< 0.05	S
Cough	7	14	> 0.05	N.S.
Breathlessness	3	6	> 0.05	N.S.
Jaundice	27	54	< 0.05	S
Oliguria	16	32	> 0.05	N.S.
Sub conjunctival hemorrhage	2	4	> 0.05	N.S.
Epistaxis	1	2	> 0.05	N.S.
Hematuria	2	4	> 0.05	N.S.
Bleeding gums	1	2	> 0.05	N.S.
Echymosis	1	2	> 0.05	N.S.

H.S. = Highly Significant, S = Significant, N.S. = Not Significant

**Table-2:** Distribution of study subjects as per their symptoms

Signs	Present	%	P value	Inference
Pallor	14	28	> 0.05	N.S.
Icterus	25	50	< 0.05	H. S
Conjunctival congestion	15	30	> 0.05	N. S
Cyanosis	3	6	> 0.05	N.S.
Hypotension	7	14	> 0.05	N. S
Hepatomegaly	42	84	< 0.05	H.S.
Splenomegaly	29	58	< 0.05	H.S.
ARDS	3	6	> 0.05	N. S
CCF	2	4	> 0.05	N.S.
Altered sensorium	2	4	> 0.05	N.S.

H.S. = Highly Significant, S = Significant, N.S. = Not Significant

**Table-3:** Distribution of study subjects as per their clinical signs

Complication	Present	%
Anemia	22	44
Leucocytosis	13	26
Leucopaenia	9	18
High ESR	26	52

**Table-4:** Distribution of study subjects as per the hematological observations

patients with leptospirosis. A total of 50 cases proved to be having leptospirosis by IgM leptospira antibody were ana-

lyzed, admitted. 76% of the patients were males. Agriculturists and housewives were accounting for 88% of the total cases. A study done in Madras by Muthusethupathi MA et al<sup>7</sup>, which included 57 cases showed outdoor manual workers accounted for 59%.

Increased incidence in men could be related to occupational exposure. All the patients had fever, 62% of the cases had fever duration less than one week. Even in Madras study<sup>7</sup> all patients had fever. Longest recorded duration of fever in this study was 30 days, which was seen in three cases. These patients had acute renal failure and low platelet count with elevated liver function tests (multi organ dysfunction). Jaundice was seen 54% of the cases. In Madras study<sup>7</sup>, 84% of cases had jaundice. In this study, 32% of the cases had oliguria, all of them had moderate to severe renal failure but total of 25 cases (50%) had acute renal failure. Of the 32% of the cases, who presented with oliguric renal failure, 10 cases (30%) required dialysis, reflecting oliguric renal failure as bad prognostic sign.

In most of the Western studies<sup>8-10</sup>, incidence of renal failure was from 80-90%. All the patients had normal renal functions at the time of discharge. 88% of cases had myalgia at the time of admission. 58% had arthralgia at the time of admission. In the Madras study<sup>7</sup> 82% of the patients had myalgia. Most of the Western studies<sup>8-10</sup> reported myalgia in 40-80% of the patients.

66% of the cases had vomiting. In our study 4% of the cases presented with altered sensorium. According to Madras study<sup>7</sup> 42% of the cases presented with altered sensorium.

Conjunctival suffusion was seen in 30% of the cases whereas in Madras study<sup>7</sup> 11 (58%) of the cases had conjunctival suffusion but Western studies show highest incidence of conjunctival suffusion ranging from 40-100%. Hypotension (systolic blood pressure less than 80 mmHg) was present in 14% of the cases at the time of admission. Hepatomegaly was seen in 84% of the cases, splenomegaly was seen in 58% of the cases. A study done in USA in 1950 showed the incidence of splenomegaly was seen in 15% and hepatomegaly to be 80%. 14% of the patients had bleeding tendencies and in all these patients platelet count was less than 50,000/mm<sup>3</sup>. In the Madras study<sup>7</sup> 26% of the cases had evidence of internal bleeding. In western studies<sup>8-10</sup> the incidence of bleeding tendencies ranges from 7-10%.

Anemia was defined as hemoglobin level less than 11 gm% was seen in 44% of the cases. This could be due to nutritional deficiency or anemia which was present before admission. 80% of cases had platelet count less than 150,000 of which 2% had platelet count less than 20,000. 6% had platelet count less than 30,000. 30% of the cases in Madras study<sup>7</sup> had thrombocytopenia (< 50,000). Lowest platelet count recorded in this study was 15,000/mm<sup>3</sup>. 14% of the patients had bleeding tendencies and in all these patients platelet count was less than 50,000/mm<sup>3</sup>. 88% of the cases had ESR more than 20 in this study. Total count ranged from 2600 to 20,000 but 26% of cases had total count more than 11,500. 18% cases had total count of less than 4500.

## CONCLUSION

Leptospirosis was more common in agriculturists. Males

were more affected. Fever was the commonest symptom at presentation. Majority of the patients presented with myalgia, jaundice and headache. 14% of the patients presented with bleeding manifestation and 30% had conjunctival suffusion.

## REFERENCES

1. Duguid BP, Marmon RHA. Swain leptospira. In: Mackie and Mc Cartney JP, editor. Medical Microbiology, 13<sup>th</sup> ed. 1978:1:398-404.
2. Visweswaran RK. An overview of leptospirosis. In: Manadal AK, editor. Textbook of Nephrology, Jaypee Brothers Medical Publishers. 1993:158-170.
3. Mandell GL, Bennett JE, editors. Mandell, Douglas and Bennett's Principles and Practice of Infectious diseases. 11<sup>th</sup> edition. Elsevier. 2004:2137-2140.
4. William. A. Petri Jr. XXII Infectious diseases. Chapter 396. Harcourt, Asia: Cecil Textbook of Medicine, 21<sup>st</sup> Edition, W.B. Saunders Company; 1761-1762.
5. Sehgal SC, Murhekar MV, Sugunan AP. Andaman hemorrhagic fever in Andaman and Nicobar Islands. Proceedings of South Asian Workshop on diagnostic methods in leptospirosis, 1995:49-51.
6. Speelman P. Infectious Diseases. In: Farci KB, editor. Harrison's Principles of Internal Medicine, 16<sup>th</sup> ed. Mc Graw Hill Medical Publication: 988-991.
7. Muthusethupathi MA, Shivkumar S, Suguna R. Leptospirosis in Madras – a clinical and serological study. J Assoc Physicians India 1995;43:456-8.
8. Watt G, Tuazon ML, et al. Placebo controlled trial of intravenous penicillin for severe and late leptospirosis. Lancet; 1998:433-435.
9. Martone WJ, Kaufman AF. Leptospirosis in human in the United States. J Infect Dis. 1979:1020-1022.
10. Merian F, Perolat P. Public health importance in south pacific a five year study in New Caledonia. Am J Trop Med Hyg.1996:174-178.

**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 28-01-2016; **Published online:** 19-02-2016