

Original/Research Article

Leptospirosis in Coimbatore, Manchester of South India: Assessment of Clinical Presentation of 93 Cases

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Abstract

The study was carried out to define the major clinical presentation and laboratory findings of human leptospirosis among suspected subjects in Coimbatore, an agricultural and textile industry area in Tamilnadu, India. In this investigation, suspected cases with a clinically compatible illness and positive serology (Microscopic Agglutination Test) were included. Detailed notification form with clinical information and other laboratory data were collected. Ninety three cases, with a mean age of 46.5 ± 12.4 years and of whom 73 (78.5%) were male, were recruited. Among this 93, almost all are contact with stagnant water of a farm, within the week prior to their admission. Fever and Myalgia were the most frequent chief complaint in 65 (69.9%). Of these cases, fever, headache and chills were reported by 93 (100%), 84 (90.3%) and 42 (45.2%) cases respectively. A novel investigation of increased serum creatinine was detected in 31 (33.3%) only in 33% of patients did CPK rise to 3 fold or more above the normal upper limit and in 67% of patients its level was within the normal upper limit range. Thrombocytopenia was noticed in 84 (90.3%) and 18 (19.35%) cases had platelets less than $20,000/\text{mm}^3$. Anaemia was detected in 64 (68.8%). ESR was more than 100 mm/hour in 12 (12.9%) cases. History of the fever, headache, myalgia and chills that have been in contact with the stagnant water of rice fields should raise the possibility of leptospirosis in Coimbatore.

Introduction

Leptospirosis is an anthroponozoonotic septicaemia zoonotic disease that affects human beings and animals with multisystemic involvement globally in both urban and rural areas especially during tropical climates.¹ The epidemics of this disease in tropical countries are often related to heavy rainfall and flooding; the south Indian states has witnessed post monsoon

epidemics of this disease in recent years.² Rural farm workers are at high risk for leptospirosis, and it can be a significant public health problem when water and food safety are not ensured. Several epidemics of leptospirosis have occurred on Andaman and Nicobar islands and in southern and western parts of India during the past century.^{3,4} It is caused by an infection with spirochaete bacteria of Family *Leptospiraceae* whose transmission usually results from direct or indirect exposure to the urine or other body fluids of leptospiruric animals.⁵ The organism has been detected from animals in many parts of the country,⁶ however, human infection have been more or less localized. In 1998, researchers warned that, unless adequate public health measures were initiated, large

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leptospirosis epidemics were possible in areas where the disease had not been previously reported; in addition they recommended improving clinical diagnosis and conducting systematic epidemiologic studies for control of the disease.⁷

Many cases of leptospirosis remain unrecognized because of the lack of specificity in signs and symptoms. Confirmation of the diagnosis is also difficult because of problems associated with isolating the organism and with serological testing.⁸ Cases of leptospirosis were rarely diagnosed in Coimbatore before 2000. Since then a yearly increase in incidence has been observed in Coimbatore, which is an agricultural and textile area. No major study on either the epidemiology or clinical picture has been done on human leptospirosis in Coimbatore so far. A better understanding of the clinical and Para clinical findings of leptospirosis is required to enhance its recognition and appropriate treatment. This present investigation was performed to define major clinical presentation and laboratory findings of serologically confirmed cases of leptospirosis admitted to major hospitals of Coimbatore, Tamilnadu, India.

Material and Methods

Patients with suspected clinical observation found in Kovai Medical Centre and Hospital, Coimbatore, Tamilnadu between June and November 2006 were recruited in this study. During personal interview with patients, the demographic and clinical information were obtained. For detecting the leptospiral antibodies, venous blood was collected to perform the reference test, Microscopic Agglutination Test (MAT) with live leptospiral culture in broth as antigen which is obtained from WHO collaborating centre for Diagnosis, Reference, Research and Training in Leptospirosis, Regional Medical Research Centre (ICMR), Port Blair, Andaman and

Nicobar Islands. Laboratory data including Complete Blood Count (CBC), Liver Function Tests (LFT), Blood Urea Nitrogen (BUN), Creatinine (Cr), Creatinine Phosphokinase (CPK), Erythrocyte Sedimentation Rate (ESR), Total and Direct Bilirubin and Urine analysis were also performed. Only MAT confirmed cases were included in the final analysis where a four fold or higher increase in antibody titre (with atleast 15 days interval). The MAT negative (less than 1:80) considered as non infectious and not included in this study.

Results and Discussion

Between June and November 2006, 300 suspected cases found in Kovai Medical Centre and Hospital (KMCH), Coimbatore were studied. Only 93 cases were confirmed by serology (MAT) and included in this study. 35 cases were shown negative and 172 cases dropped out of the study because of the follow-up sample could not be obtained. Among the 93 serological positive cases, men accounted for 73 cases (78.5%) whose mean age was 46.5 ± 12.5 years (range 22- 75 years).

72 of the patients (77.4%) were in the working age population (between 22–60 years), farmers accounted for 61 cases (65.6%) and all patients had a history of being in contact with stagnant water of farm within the week prior to visit to hospital. The number of cases were in peak during August with 49 out of 93 cases (52.7%) whereas the 4, 21, 14 and 5 were found in July, September, October and November respectively. The most frequent affecting gender in this study is male whose MAT positivity is 90% more than 1:640. 64 (68.8%) of cases had an antibodies against leptospiral strains whose titre $> 1:320$ in the first serum specimen and 29 (31.2%) cases had a four fold increase or seroconversion in the second serum specimen. The major complaints observed in these patients were

fever and chills. The results of clinical manifestation observed in this study like Fever, Headache and Myalgia were reported by 93 (100%), 84 (90.3%) and 65 (69.9%) cases respectively (Table 1).

In the Biochemical point of concern, increases serum creatinine was detected in 31 (33.3%) cases and more than 75% showed abnormalities in their urine microscopic evaluation for the presence of RBC. 33% of the cases did CPK rise to 3 fold / more above the Normal Upper Limit (NUL), whereas 67% was within the normal range. AST and ALT were above the NUL in 64 (68.8%) and 72 (77.4%) cases respectively. Alkaline phosphatase was higher than NUL in 86 (92.3%) patients; 68 (73.1%) cases showed hyperbilirubinaemia, which were mostly direct hyperbilirubinaemia. Thrombocytopenia (platelet count < 150,000) was

noticed in 82 (88.2%) cases and 14 (17.1%) of them had platelets less than (25000/mm³). Anaemia was also observed as obvious finding in 79 (84.9%) cases compared with NUL (< 13 g/dl in males and < 12 g/dl in females). ESR was more than 100 mm/h in 21 (22.6%) cases. Significant laboratory results included in this study showed the clear evidence of renal abnormalities, hepatic disturbances, elevated CPK, ESR, haematological abnormalities and these are shown in Table 2. The confirmed patients are transferred to wards and all patients received antibiotic therapy with Benzyl Penicillin (Penicillin G) of 2,000,000 IU.

This investigation reflects the majority of recognized leptospirosis cases within this Coimbatore area in 2006 and to our knowledge this is the first report of this data from this area. Most of the cases included in this study are men in the working age group, and they have contact with stagnant water, which is compatible with previous studies,⁸⁻¹¹ whereas the morbidity among male was less than other reports in which more than 90% were men.⁹⁻¹² This may be due to greater participation in farming process and therefore more exposure to stagnant water in this area. Fever and Headache were the most common symptoms on admission in this study like other reports.^{9,13-16} Myalgia involved in 65 cases which is less than other studies,^{9,17-19} which reports more than 90% like some other studies²¹.

Jaundice is common in our study which play a major role in the leptospirosis of liver involvement.^{11,21} Conjunctival suffusion is a major and important tool in the confirmation of leptospirosis¹⁴ but occurred only in 43% of cases in this investigation. Abnormal serum creatinine was seen in this study (53.9%), same like many reports,^{14,22,23} but the cases showed an increase of more than three fold

Table 1 : Clinical Findings of 93 cases, Coimbatore, 2006

| | Number of Patients | Percentage |
|-------------------------------|--------------------|------------|
| Major Complaint (n=93) | | |
| Fever | 48 | 51.6 |
| Icter | 15 | 16.1 |
| Headache | 12 | 12.9 |
| Others | 18 | 19.4 |
| Signs & Symptoms | | |
| Fever and Chills | 93 | 100 |
| Headache | 85 | 91.4 |
| Myalgia | 59 | 63.4 |
| Malaise | 57 | 61.3 |
| Nausea | 53 | 57.0 |
| Vomiting | 51 | 54.8 |
| Jaundice | 51 | 54.8 |
| Abdominal pain | 48 | 51.6 |
| Urine Discoloration | 46 | 49.5 |
| Conjunctival suffusion | 43 | 46.2 |
| Blurred vision | 38 | 40.9 |
| Cough | 32 | 34.4 |
| Nuchal rigidity | 26 | 28.0 |
| Chest pain | 22 | 23.6 |
| Diarrhoea | 11 | 11.8 |
| Dyspnea | 08 | 8.6 |

Table 2 : Laboratory findings for 93 MAT confirmed cases, Coimbatore, 2006

| | No. of Patients included | No. of Patients affected | Percentage |
|--|-----------------------------|-----------------------------|------------|
| Renal | | | |
| Blood Urea Nitrogen > 20 mg/dl | 93 | 42 | 45.7 |
| Creatinine > 1.5 mg/dl | 90 | 23 | 25.5 |
| Haematuria > 3 RBC/HPF* | 90 | 56 | 62.2 |
| Pyuria > 5 WBC/HPF | 90 | 26 | 28.8 |
| Proteinuria 1+ | 83 | 57 | 68.7 |
| 2+ | 83 | 14 | 16.9 |
| Hepatic | | | |
| Alanine aminotransferase (ALT) > 35 U/L | 91 | 85 | 93.4 |
| Aspartate aminotransferase (AST) > 35U/L | 91 | 82 | 90.1 |
| Alkaline phosphatase (ALP) > 120 U/L | 90 | 89 | 98.8 |
| Total Bilirubin > 1.2 mg/dl | 86 | 56 | 65.1 |
| Direct Bilirubin > 0.4 mg/dl | 86 | 51 | 59.3 |
| Haematologic | | | |
| Creatinine kinase (> 70 U.L in females and > 90 U/L in males) | 63 | 34 | 53.9 |
| WBC Count > 10000 cells/mm ³ | 72 | 29 | 40.3 |
| Platelet Count < 150000 cells/mm ³ | 75 | 62 | 82.7 |
| Hemoglobin (< 13 in male and < 12 g/dl in female) | 93 | 76 | 81.7 |
| Haematocrit < 34% | 93 | 43 | 46.2 |
| ESR > 100 mm/h | 68 | 21 | 30.9 |
| > 50 mm/h | 68 | 51 | 75.0 |

* High Power Field

of the NUL. This finding correlated with Myalgia to some extent.²⁰ Leucocytosis and Leucopenia frequency was same like other studies.^{5,9,20,24} Thrombocytopenia, well documented findings in leptospirosis, was very common in this disease even more than other reports.^{9,25}

The finding of urinalysis was abnormal, consistent with other reports,^{5,9} but proteinuria is common in this study. Anaemia is very common in this investigation as like Nicodema *et al.*²⁶ High ESR level was common^{14,18,27} and nearly one third of patients had an ESR level more than 100 mm/h. In this agricultural area, there is a raising possibility of leptospirosis in contact with stagnant water of rice fields leads to the classic history of fever, headache and myalgia in patients. The unusual observation of high

number of patients with very high ESR and anaemia need further elucidation. This parameter may considered properly and same with the patients.

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