AN OBSERVATIONAL STUDY ON CHANGE IN PATTERNS OF CLINICAL PRESENTATIONS IN LEPTOSPIROSIS OVER THIRTY YEARS IN SOUTH INDIA

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ABSTRACT

BACKGROUND

Leptospirosis is a widespread zoonotic disease prevalent in the tropics and temperate regions of the world. The clinical profile of the disease is highly variable with subclinical presentations as well as classical presentation in the form of fever with disproportionate myalgia; mild hepatocellular jaundice, subconjunctival haemorrhage, with polymorpholeukocytosis (Weil's syndrome). Rare forms of presentation and complications in the form of myocarditis, acute renal failure, acute liver failure, acute respiratory distress syndrome (ARDS) and pulmonary haemorrhage, aseptic meningitis have also been noted.

MATERIALS AND METHODS

It is a retrospective observational study on 3 sets of 40 patients each, from different periods spread across 1983-84, 1988-89, 2004-05, conducted in a tertiary care centre in south India.

RESULTS

Total 120 cases were studied, mean age was 40.3 yrs. 85 percent of them were males. The mean time between symptom onset and admission was 7.5 days. The incidence of renal failure and acute respiratory distress was higher (49 %) among patients admitted during 2004-2005 compared with the earlier groups. Crystalline penicillin started earlier cured almost all cases.

CONCLUSION

Leptospirosis is an important zoonotic disease in south India, with a wide variety of clinical presentations. The natural history of the disease when detected earlier clinically can improve the treatment outcome dramatically. Newer diagnostic modalities have increased disease detection rate but still clinical diagnosis is the cornerstone of better patient care. The treatment strategies have changed over the years but the therapy with crystalline penicillin is still the gold standard.

KEYWORDS

Leptospirosis, Weil's Syndrome, Myocarditis, ARDS, Pulmonary Haemorrhage, Penicillin.

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BACKGROUND

Leptospirosis is a widespread and prevalent zoonotic disease. It occurs in both temperate and tropical region, incidence in tropics approximately 10 times higher than in temperate regions.[1] It is caused by the spirochete of genus leptospira, with over 250 serovars which are pathogenic. Rodents were the first recognized carriers of leptospirosis and are the only major animal species that can shed the pathogens throughout their lifespan without clinical manifestations, i.e. prolonged carrier state. All mammals can be considered potent carriers even though rodents are the most associated with outbreaks.

The most common ones are ichterohaemorrhagiae, Copenhageni, Grippotyphosa and Ballum, which have been often associated with rodents, even though other serovars have also been isolated from cases.

Leptospira can infect humans through cuts and abrasions in the skin, through intact mucous membranes (nose, mouth, eyes) and also via waterlogged skin.[2]

The clinical course of leptospirosis is variable, and hence a lot many cases go undetected until complications set in. Local agricultural practices, overcrowding, poor housing facilities and unclean environment and increase in pollution are characteristics of outbreaks in susceptible populations. The disease is presently endemic and deeply entrenched in Karnataka, Gujarat, Maharashtra, Kerala, Tamil Nadu, and Andaman and Nicobar Islands. High risk areas include Goa, Andhra Pradesh, Orissa and West Bengal.

Most cases are mild and self-limited or subclinical, while some are severe and potentially fatal. The illness generally presents with the abrupt onset of fever, rigors, myalgias and headache in 75-100% of patients following an incubation period of 2-26 days.

The characteristic syndrome consists of fever, disproportionate muscle tenderness, jaundice and subconjunctival haemorrhage.[2,3]

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Leptospirosis may be complicated by jaundice and renal failure, pulmonary haemorrhage, acute respiratory distress syndrome, myocarditis, aseptic meningitis.[4] Another important differential diagnosis is Hantavirus disease in which ESR is much lesser.

Mortality rates in hospitalized patients with leptospirosis range from 4 to 52 percent.[4,5,6]

The diagnostic criteria for leptospirosis is a modified Faine's criteria that utilizes clinical, epidemiological, and microbiological parameters,

Modified Faine's Criteria	
Clinical Features (A)	**Score**
Fever	2
Headache	2
Temperature >39° C	2
Myalgia	4
Conjunctival Suffusion	4
Meningism	4
Jaundice	1
Albuminuria/elevated BUN	2
Epidemiological Factors (B)	
Rainfall	5
Contaminated environment	4
Animal Contact	1
Laboratory Criteria (C)	
Culture Diagnosis Confirmed	
ELISA IgM	15
MSAT (Macroscopic agglutination test)	15
MAT (Macroscopic agglutination test)- Single Positive high titer	15
MAT- rising titer (Paired sera)	25

Each feature is given appropriate scoring.

Presumptive diagnosis of leptospirosis is made of Part A or Part A+B with a score of 26 or more

Part A+B+C = 25 or more and in serological tests, only one test should be scored.

Aim and Objectives of the Study

Aim of the study is to identify the changes in the clinical pattern of leptospirosis over time, and to analyse its clinical presentations among various group of patients over a span of 30 years.

MATERIALS AND METHODS

This is a retrospective study including patients with leptospirosis admitted to a health care centre during the years 1983-84 (J.J.M Medical College, Davangere, Karnataka), 1988-89 (Dr. Prabhakarans Hospital, Vandoor, Kerala) and 2004-2005 (Pariyaram Medical College, Kannur, Kerala) with each group containing 40 patients. Demographic, clinical and laboratory data were compared between the groups.

Inclusion Criteria

All newly diagnosed cases based on the clinical and laboratory evidence.[7]

Exclusion Criteria

Previously diagnosed cases of leptospirosis.

Source of Data Collections- All cases were from among patients admitted to Babuji Hospital, attached to the JJM Medical College, Davangere, Dr. Prabhakaran Hospital, Vandoor, Kerala and Pariyaram Medical College, Kannur, Kerala.

RESULTS

A total of 120 patients were included. 85 percent of them were males. The mean time between symptom onset and admission was 7.5 days. The incidence of renal failure and acute respiratory distress was higher (49 %) among patients admitted during 2004-2005 compared with the earlier groups. This change also reflected in their corresponding mortality. However, three of the patients in 1983-84 died due to delay in diagnosis and was retrospectively found to have leptospirosis. All the rest responded well to crystalline penicillin including a peculiar case whose sole presentation was isolated severe myalgia. All these patients were confirmed to have leptospirosis with either urine dark field microscopy or antibody tests. The results are in contradiction to the previous study which shows decline in mortality and incidence of severe complications over the years.[8]

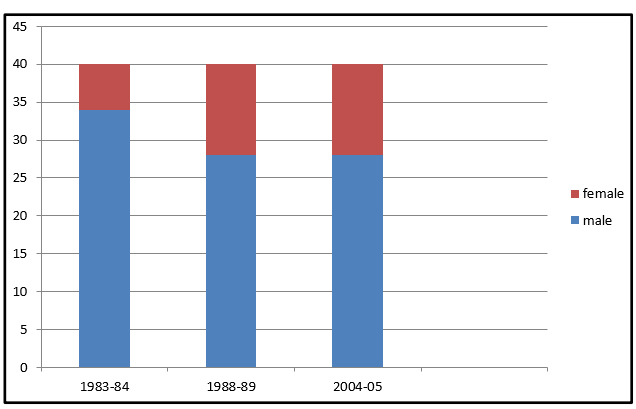

Figure 1. Gender Distribution of Cases

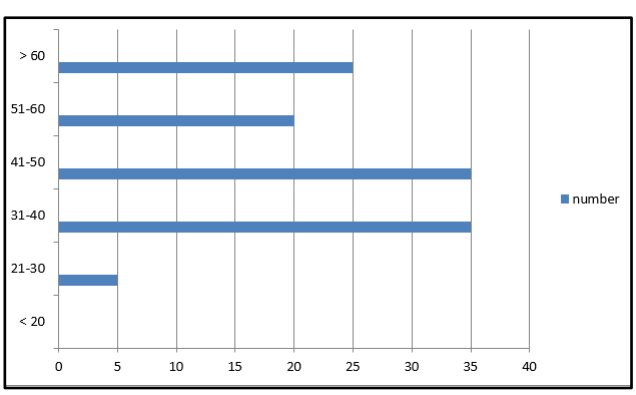

Figure 2. Age Wise Distribution of Cases

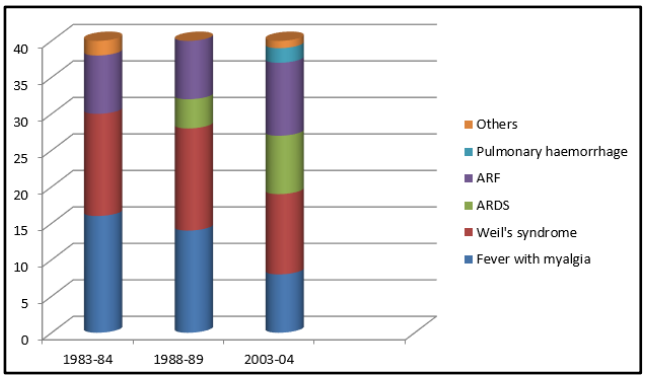

Figure 3. Clinical Presentation of Cases

DISCUSSION

In our study on the clinical presentations of leptospirosis from the same locality over a period of 30 years. The clinical characteristics considered were fever, disproportionate muscle tenderness, jaundice and subconjunctival haemorrhage.

The laboratory values of total and differential white cell count and were significant and we encountered polymorpholeucocytosis. The only one differential diagnosis with such a haemogram is pyogenic liver abscess where jaundice is minimal and no subconjunctival haemorrhage. It was noted that consistent with previous studies, most patients in the present study were male. The male sex has been extensively associated with the risk of leptospirosis infection, due to the connection of leptospirosis infection with occupations traditionally attributed to men, such as abattoir and sewage workers, as well military personnel. Consequently, males are usually more exposed to Leptospira spirochetes.[9]

Like the previous researches it was found that older age and the presence of comorbidities have been extensively associated with death in leptospirosis patients.[10]

It was also found that incidence of leptospirosis is very less in paediatric age group due to decreased exposure to farming practices. Among farmlands, the incidence was found more among watermelon and paddy farmers. Other at-risk employees were water tank cleaners and animal husbandry workers. Second time infection was not seen among study groups.

In contrast to previous studies, an increasing trend in mortality was seen over these three decades which probably reflects the incidence of severe pulmonary complications. There is also evidence that the use of penicillin is associated with a reduction in hospital length of stay and fewer complications, including AKI.[11]

CONCLUSION

There is definite change in pattern of clinical presentations and complication in Leptospirosis in cases among South India over span of thirty years. The main changes being higher incidence of pulmonary renal complications and higher mortality. Early diagnosis and initiation of antibiotic therapy can result in better prognosis, with crystalline penicillin still being the most effective drug available, even though other drugs including doxycycline, azithromycin, third generation cephalosporins have also been found to be efficacious. From our observation, patients presenting with untreated leptospirosis after 5 days have very high mortality. The use of NSAIDs, and other nephrotoxic or hepatotoxic drugs were found to develop dangerous complications. Comorbid illnesses like alcoholism, pre-existent liver diseases, heavy smokers, and patients with chronic kidney disease, coronary disease; the mortality is higher. Paediatric age group leptospirosis is relatively less in number.

REFERENCES

[1] Hartskeerl RA, Collares-Pereira M, Ellis WA. Emergence, control and re-emerging leptospirosis: dynamics of infection in the changing world. Clin Microbiol Infect 2011;17(4):494-501.

[2] Sanford JP. Leptospirosis-time for a booster. N Engl J Med 1984;310(8):524-525.

[3] Berman SJ, Tsai CC, Holmes K, et al. Sporadic anicteric leptospirosis in South Vietnam. A study of 150 patients. An Intern Med 1973;79(2):167-173.

[4] Singh J, Sokhey J. Epidemiology, presentation & control of leptospirosis. Proceedings of the third round table conference. Series-leptospirosis. Ranbaxy Science Foundation 1998;(3):17-31.

[5] Sambasiva RR, Naveen G, Bhalla P, et al. Leptospirosis in India and the rest of the world. The Brazilian Journal of Infectious Disease 2003;7(3):178-193.

[6] Pradeep CKS, Sumathi G, Rao VRG, et al. Leptospirosis laboratory. Chennai medical college - a three year experience in sero- diagnosis (1995-1997). Indian J Med Microbiol 1999;17(1):50-51.

[7] Dupont H, Dupont-Perdrizet D, Perie JL, et al. Leptospirosis: prognostic factors associated with mortality. Clin Infect Dis 1997;25(3):720-724.

[8] De Francesco DE, de Carvalho GSG, de Sousa Soares, et al. Changing patterns in leptospirosis: a three decade study in Brazil. Internaltional Journal of Infectious Diseases 2017;60:4-10.

[9] Sarkar U, Nascimento SF, Barbosa R, et al. Population-based case-control investigation of risk factors for leptospirosis during an urban epidemic. Am J Trop Med Hyg 2002;66(5):605-610.

[10] Ko AI, Reis GM, Dourado RCM, et al. Urban epidemic of severe leptospirosis in Brazil. Salvador Leptospirosis Study Group. Lancet 1999;354(9181):820-825.

[11] Daher EF, Silva GB, de Abreu KL, et al. Leptospirosis-associated acute kidney injury: penicillin at the late stage is still controversial: Penicillin in leptospirosis. J Clin Pharm Ther 2012;37(4):420-425.