Utilization of Faine's Criteria for the Diagnosis of Leptospirosis

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Abstract :

Aim: *To analyze the clinical profile of patients in and around Mysore with leptospirosis using modified Faine's criteria*

Methods: *All the suspected cases of leptospirosis (admitted with fever > 5 days) were subjected to screening test, ELISA. Only those patients who were serologically positive were used for analysis utilizing modified Faine's criteria [clinical (A) + epidemiological (B) + laboratory findings (C). A+B+C > 25 to diagnose leptospirosis.*

Results: *115 patients with positive Faine's criteria were analyzed. There were 83 males & 32 females. Mean age was 51.2 years. The predominant number of infected subjects were farmers (48.7%) followed by other outdoor workers (23.5%). Contact with contaminated soil, vegetation or water or with the body fluids of infected animals were the important epidemiological risk factors. Rainfall also played a major role in the spread of the infection. Fever, headache, hepatomegaly, vomiting and myalgia were the common clinical features observed in the subjects. Mortality was (0.86%).*

Conclusion: *We recommend that all persons with fever for >5 days should be screened for leptospirosis utilizing modified Faine's criteria which is a simple guideline for diagnosis of leptospirosis and this will help prevent morbidity and mortality.*

Keywords: *leptospirosis, Faine's criteria, diagnosis, epidemiological risk factors*

I. Introduction

Leptospirosis is the most widespread zoonosis in the world. It is emerging as a major public health problem. The clinical manifestations are diverse, ranging from mild, flu-like illness to the severe form known as the Weil's syndrome [1]. It is under reported and underdiagnosed in India [2]. It has been reported from Kerala, Maharashtra, Andaman's, Tamilnadu & Gujarat. The incidence of Leptospirosis in developing countries is found to be 10 - 100/1,00,000 cases per year. As per this data, India should report 0.1 - 1.0 million cases per year, but less than 10,000 cases are reported. There is paucity of such data from Karnataka especially South Karnataka. This is due to the lack of proper diagnostic facilities. Kerala, Gujarat, Tamilnadu and Maharashtra are the states that report more than 500 cases per year. Andaman and Nicobar Islands, Andhra Pradesh, Assam, Goa, Delhi, Karnataka, Orissa, Puducherry, and Uttar Pradesh are the other regions in India that report cases of leptospirosis [3,4]. Leptospirosis presents with non-specific symptoms which makes the diagnosis even more difficult. The outbreaks in developing countries are usually associated with occupational exposure or due to environmental factors. In developing countries half a million cases are reported yearly and the mortality rate ranges from 5 to 10%. Infection with Leptospira commonly occurs through direct contact with infected animal urine or through contaminated water. The World Health Organization (WHO), came up with the Faine's criteria in recognizing that the laboratory tests are rarely helpful in the diagnosis of leptospirosis, which mainly include the scoring of clinical and epidemiological history of a patient (Parts A and B) while being supported by laboratory parameters (Part C) [5]. Modified Faine's criteria is a simple scoring system which is recommended for diagnosis in Indian institutions [6]. This is the modification of the original Faine's criteria (WHO guidelines) and this makes the diagnosis simple [7]. This study has been undertaken to analyse the leptospirosis cases in and around Mysore utilizing the modified Faine's criteria.

II. Materials And Methods

Patients attending JSS Hospital with symptoms of leptospirosis who were positive by IgM ELISA (PanBio,Brisbane,Australia) were taken up for the study. Patients aged 15 years and above were considered for the study. The period of study was from January 2014 to December 2014. Diagnostic criteria for Leptospirosis was analysed utilizing Modified Faine's criteria --Clinical, Epidemiological, Laboratory data (score >25). (Table -1).

Clinical features (A)	Score	
Fever	2	
Headache	2	
Temperature > 39 deg.C	2	
Myalgia	4	
Conjunctival suffusion	4	10
Meningism	4	
Jaundice	1	
Albuminuria/ elevated BUN	2	
Epidemiological factors (B)		
Rainfall	5	
Contaminated environment	4	
Animal contact	1	
Laboratory criteria (C)		
Culture	**Diagnosis certain**	
ELISA IgM	15	
MSAT	15	
MAT- 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.		

The protocol of this study was approved by the ethical committee of the institution. A semi structured questionnaire was prepared for collecting the personal data of the patients and to analyze the risk factors associated with leptospirosis: living conditions, over- crowding, direct contact with animals and contact with contaminated water along with the laboratory investigation results. All cases were confirmed by Microscopic agglutination test. A titer of >1:100 is taken as significant

III. Results

A total of 332 patients suspected of leptospirosis were subjected to ELISA. Out of these 115 gave a positive result. There were 83 males and 32 females. The mean age was 51.2 years. The most number of patients were farmers, followed by other outdoor workers such as sewage workers, mechanic, people working for daily wages etc. Table :2 shows the occupation of the patients.The risk factors were also analyzed. Table:3 shows the epidemiological factors.

Table 2: Occupation

Occupation	n = 115(%)
Farmer	48.7%
Other outdoor works	23.5%
House wives	17.4%
Students	10%

Table:3 Epidemiological Factors

Factor	n =115(%)
Contaminated Environment	97%
Rainfall	56%
Animal Contact	91%

Contact with contaminated water and soil was the major risk factor observed during the study. Rainfall had a major role in the occurrence of the disease as majority of the serological positive cases were reported during the rainy season- from July to September. Table -4 shows the seasonal distribution of cases.

Table:4- Monthly distribution of cases

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	1	2	1	9	20	36	31	10	4	1

The occurrence of clinical features were as follows, fever- 100%, headache- 72.2%, hepatomegaly-53%, vomiting-47%, myalgia-43.5%, splenomegaly-27.8%, pain abdomen-23.5%, conjunctival suffusion-15.7%, Jaundice-14.7%, anuria-6.9% and cough-5.2%. The Faine's scoring was done for all the positive samples, about 53% of the cases had a score between25-30 and another 39 % had a score between 31- 35. Table 5 shows Faine's scoring.

Table:5 Faine's scoring obtained during the study

Score	n=115 No. of cases
25 -30	61
31 -35	45
36 – 40	9
>40	0

IV. Discussion

Leptospirosis is an emerging public health problem in developing countries due to the improper living and sanitary conditions. Agriculture is the main source of income to the people of Karnataka, mainly sugarcane and paddy cultivation in South Karnataka. The water logged fields, the handling of animals and the use of community ponds in which both humans and animals bath, contribute to the human infections. This study reveals that leptospirosis is prevalent in this part of Karnataka with prevalence rate of about 34.6 %. This is similar to the study done by S. Shivakumar et al. in 2007 in which they had reported a prevalence rate of 33%. This study has utilized modified Faine's criteria in which the clinical, epidemiological and laboratory parameters are given appropriate scoring which aids in the diagnosis of leptospirosis and this is a simple guideline for clinicians for the diagnosis of the disease. A score of 26 or more when using part A and B (Or) 25 or more using Part A+B+C can be considered as current leptospirosis. Shivakumar et al. suggest the use modified Faine's criteria for the diagnosis of leptospirosis depending on the conditions existing in the area of study. MAT, though the gold standard is cumbersome. The maintenance of live leptospiral cultures is not possible in a resource limited setting. ELISA is simple, cheap and sensitive genus specific test, it can be used for diagnosis of leptospirosis utilizing Faine's criteria. Canal et al in 2013 in their work found that ELISA is highly sensitive in the diagnosis of the disease. The results of our study were in contradiction to the study done by Bhatia et al. in 2015, were they suggested that modified Faine's criteria may not be as useful a diagnostic tool as it has traditionally been thought to be and more studies should be carried out to evaluate its diagnostic utility.

In patients who are positive for leptospirosis by ELISA (C), clinical features (A) & epidemiological features (B), also need to be evaluated (A+B+C > 25). It was observed that contaminated environment (97%) & animal contact (91%) were the important risk factors. Rainfall contributed to 56% of cases. This study utilizing modified Faine's criteria has identified anicteric leptospirosis as the common presentation. Most of the patients had scores from 25 to 30.

V. Conclusion

In our study we came to a conclusion that modified Faine's criteria suggested by S. Shivakumar et al. is appropriate for the diagnosis of leptospirosis in India. Rainfall is the major epidemiological factor. Fever, head ache and hepatomegaly were the most common presentations. Contaminated environment is the leading epidemiological factor in the occurrence of the disease. We recommend that all persons with fever for >5 days should be screened for leptospirosis utilizing modified Faine's criteria which is a simple guideline for diagnosis of leptospirosis and this will help prevent morbidity and mortality to a greater extend in a resource limited setting.

Acknowledgements

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