ORIGINAL ARTICLE

A STUDY ON CARDIOVASCULAR MANIFESTATION IN LEPTOSPIROSIS CASES IN A TERTIARY CARE HOSPITAL OF SURAT CITY

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ABSTRACT

Background: Despite the fact that as many as 20% of patients may have associated cardiac involvement, these manifestations are seldom discussed in reviews on the clinical aspects. The present study has been carried out to know the involvement of cardiovascular system as indicator and mortality in leptospirosis.

Methodology: The present study was carried out in Govt Medical College, Surat during outbreak of Leptospirosis where all the patients with clinical suspicion of Leptospirosis were screened by IgM anti leptospira antibody ELISA (SERION ELISA), CK-MB levels, ECG changes and 2D ECHO changes.

Results: Myocarditis is maximum in more than 56 years which is about 66.6%. Out of 35 patients who were investigated with 2D echo, 18 patients (51.4%) had abnormal 2D ECHO findings. In the present study 18 patients had 2D ECHO changes in the form of reduced ejection fraction, regional wall abnormality, pericardial effusion and valvular abnormality. As the Ejection Fraction decreases the mortality increases. In EF 40-50% non survivors are 28.6%, EF 30-40% non survivors is 62.5% and EF less than <30 the mortality is 80%.

Conclusion: Cardiovascular involvement is seen in 37.1% of patients in the form of ECG changes, hypotension and ECHO changes. Of these patients with cardiovascular involvement showed that there were functional changes but no organic changes in form of chamber enlargement or valvular involvement.

Keywords: Leptospirosis, Cardiovascular Manifestation, 2D Echo

INTRODUCTION

Leptospirosis causes a wide spectrum of disease ranging from asymptomatic infection or influenza like symptoms to classical Weil's disease with fever, jaundice, hemorrhagic episodes, myocarditis, aseptic meningitis, hepatitis and nephritis. Myocarditis may sometimes cause intractable hypotension and cardiac arrhythmias and might become fatal. Cardiovascular involvement in leptospirosis includes Arrthymias, Myocarditis, pericarditis, cardiogenic pulmonary edema, congestive cardiac failure and even death.[1]

Previous studies of patients with severe leptospirosis have usually focused on the hepatic and renal manifestations of this illness.[2] Despite the fact that as many as 20% of patients may have associated cardiac involvement, these manifestations are seldom discussed in reviews on the clinical aspects.[3] Leptospirosis is a potentially serious but treatable disease. So early diagnosis and prompt treatment is necessary to improve outcome. The present study has been carried out to know the involvement of cardiovascular system as indicator and mortality in leptospirosis.

METHODOLOGY

The present study was carried out in Govt Medical College and New Civil Hospital, Surat during outbreak of Leptospirosis (July to October) from 2014 to 2015. All the patients with clinical suspicion of Leptospirosis who presented with fever with chills, headache, conjunctival suffusion, myalgia, jaundice, or oliguria were screened by IgM anti leptospira antibody ELISA (SERION ELISA). Blood samples were drawn on the first and fourteenth day of presentation. A fourfold or greater increase in agglutinin antibody titre on paired samples was considered diagnostic. If patient died before the fourteenth day than initial titre of greater than 1:40 was considered diagnostic. Any patients presenting with the above clinical features and fulfilling any one of the above two laboratory criteria was defined as case of leptospirosis and included in study. Patients in this study group were subjected to detailed clinical examination and investigation for specific organ involvement was carried. 2D ECHO

was done in all patients to know the cardiac involvement in leptospirosis.

RESULTS

Majority of patient belong to age group 26-35 yrs, mean age of 30±3 yrs, which accounts to be 44% of total number of patients. Out of the total of 35 patients, 77% were males while rest 23% was female. Male to Female ratio is 4:1. Among non-survivor group 47.50% were males and 60% were females. Among survivor group 52.50% were males and 40% were females.

It is seen that myocarditis is quite diffuse but is variable in different age groups. It is maximum in older age groups i.e., more than 56 years which is about 66.6%,which is due to wear and tear of tissue making it vulnerable to toxic/inflammatory effects of infection. It is found that males (69.4%) are involved more in terms of number due to higher incidence of infection in this age group as compared to female.

In all the 35 confirmed leptospirosis patients, 2D ECHO was done with special consideration to patient with ECG changes. Out of 35 patients who were investigated with 2D echo, 18 patients (51.4%) had abnormal 2D ECHO findings. 5 patients were excluded from my study due to previous history of cardiovascular involvement (HTN, IHD). Hence 13 patients (37.1%) had ahnormal 2D ECHO findings without any previous cardiovascular insult.

In the present study 18 patients had 2D ECHO changes in the form of reduced ejection fraction, regional wall abnormality, pericardial effusion and valvular abnormality. As the Ejection Fraction decreases the mortality increases. In EF 40-50% non survivors are 28.6%, EF 30-40% non survivors is 62.5% and EF less than <30 the mortality is 80%. Ejection Fraction may be considered as prognostic indicator of mortality. Pericardial effusion is seen in 5(14.28%) out of 35 patients.

It was seen that Regional Wall motion abnormality is seen in 10 (28.5%) out of 35 patients. Among them, 7(63.63%) patients with RWMA are non survivors and 36.36% were survivors. Pericardial effusion is seen in 5(14.28%) out of 35 patients.

Table 1: Age Distribution of cases

Age (years)	Total	Confirmed Patients	Percentage (%)
15-25	12	3	9
26-35	34	15	43
36-45	16	10	29
46-55	9	4	10
>56	4	3	9
Total	75	35	100

Table 2: Distribution of cases according to Symptomatology

Symptoms	Total	Suspected	Confirmed
Fever	72	39	33
Myalgia	68	38	30
Headache	60	40	20
Vomiting	40	28	12
Hemetemesis	6	04	02
Cough	65	44	21
Breathlessness	37	21	16
Hemoptysis	18	12	06
Oliguria	31	13	18
Yellow sclera	68	38	26
Convulsion/Altered sensorium	05	02	03

Table 3: Distribution of cases according to signs

Signs	Total	Confirmed	Survivors	Non-survivors
Pallor	55	20	39	16
Icterus	65	24	45	20
Conj. H"ge	35	18	17	18
Tachycardia	46	14	32	14
Signs of meningeal Irritation	02	01	01	01
Hypotension (SBP<90)	42	14	28	14
Crepts on auscultation	56	18	38	18
Tachypnea (RR>30)	45	18	30	15
Raised JVP	12	06	04	08
Petechie/purpura	15	08	3	12

Table 4: ECG Changes

ECG changes	Survivors (%)	Non survivors (%)	Total (%)
Sinus tachycardia	08 (57.1)	06 (42.8)	14 (40.0)
1 deg AV block	06 (40.0)	09 (60.0)	15 (42.8.0)
VPCs	03 (60.0)	02 (40.0)	05 (14.2)
AF	02 (40.0)	03 (60.0)	05 (14.2)
RBBB	00	01	01
QT prolongation	02 (40.0)	03 (60.0)	05 (14.2)
ST T changes	04 (50.0)	4 (50.0)	08 (22.8)

Table 5: Correlation with CPK-MB and Myocarditis

CPK MB	Total (%)	Survivors	Non survivors
Increased	10 (76.9)	04	06
Normal	03 (23.07)	03	00

DISCUSSION

In the present study, majority of patient belong to age group 26-35 yrs, mean age of 30 ± 3 yrs, which accounts to be 44% of total number of patients. This can be explained by the fact that majority of patients in this age group are active members of the family with

higher chances of environmental exposure to leptospires. The >56 yrs age group is least affected and this can be explained by the sedentary life at this age group which minimizes the chances of environmental exposure in patients. S.Borwankar et al[4] study closely correlates who found that maximum number of patients 55% were in age group of 13-40 years. In the present study, out of the total of 35 patients, 77% were males while rest 23% was female. Male to Female ratio is 4:1. So in my study, 77% were males. This may be because of more males going to the farm for work as they are earning member of family and so high chances of exposure to contaminated water during work. Sphichler et al[5] found that 83% were males and 17% females. M.Muthusethupathi et al[6] observed that in their study that 88% were males.

In present study, most common findings were 1st degree AV block, which was noted in 15(42.8%) most of this patient was hypotension at the time of admission. Second most common ECG changes were Sinus tachycardia which was 14(40%). Our study was comparable to one done by S.T.Trivedi[7] in the same institution which showed AV conduction block and ST-T changes as most common ECG changes in leptospirosis. Singh V.P.et al[8] showing most common findings being 1 deg AV block in 44% of patient followed by sinus tachycardia. Other ECG changes are also comparable in both the studies. Also we can seen from the above table that mortality is more in patients with increased CKMB levels as compared to normal levels. Hence CKMB level is also important prognostic marker in cardiac leptospirosis. This finding was comparable to those studies done by Singh V.P.et al[8] which showed 85% cases of myocarditis with elevated CKMB levels.

CONCLUSION

Cardiovascular involvement is seen in 37.1% of patients in the form of ECG changes, hypotension and ECHO changes. Of these patients with cardiovascular involvement showed that there were functional changes but no organic changes in form of chamber enlargement or valvular involvement. Present study suggests that cardiovascular involvement in leptospirosis was 37.1%, manifestation in the form of clinical evidence, ECG changes and LV systolic and diastolic dysfunction on echocardiography. These patients were treated with antibiotics and methylprednisolone. 60% patients improved on discharge suggest the damage was functional rather than organic in leptospirosis. Thus by early detection of cardiovascular changes in my study morbidity and mortality were reduced in our patients.

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