Research Paper

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Study Of Pulmonary Involvement In Leptospirosis

Medical Science

KEYWORDS :

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ABSTRACT

BACKGROUND: Leptospirosis, a zoonotic disease caused by spirochetes of genus Leptospira. It has a worldwide distribution and is common in the humid tropical and subtropical areas, where most developing countries are found. It is a greater problem in tropical countries than those with a temperature climate. Outbreak mostly occur as a results of heavy rainfall and consequent flooding.41 Leptospirosis is very common form in south Gujarat since last few years, particularly its occurrence in rainy season in the month of July to September. During this period, farm worker acquire infection while working in farm. Pulmonary symptoms are common in icteric cases, so high degree of suspicion , early recognition and prompt referral to higher centres with facility of mechanical ventilator is necessary to because to decrease mortality.

AIMS AND OBJECTIVES:

1) To study the pulmonary involvement in Leptospirosis.
2) To study the involvement of other organ systems in Leptospirosis bedsides pulmonary involvement.
3) To know the prognostic factors in cases having due to Leptospirosis.
4) To study mortality in pulmonary due to Leptospirosis.
5) To study the role of multi organ dysfunction along with pulmonary involvement in mortality due to Leptospirosis.

METHOD:

The present study was carried out in new civil hospital , Surat (NCHS) during the outbreak in the years 2005 and 2006 between the month of July and October. All the patients referred to NCHS with clinical suspicion of Leptospirosis were studied.

CONCLUSION:

Pulmonary involvement is one of the common modes of presentation in Leptospirosis in south Gujarat. Breathlessness ,cough, and haemoptysis are common pulmonary symptoms on presentation .ARDS and alveolar haemorrhage are important complications of pulmonary involvement in Leptospirosis and associated with high mortality .Plasmapheresis is a newer modality of management in pulmonary involvement with Leptospirosis and has promising results and can be tried in future.

INTRODUCTION:

Leptospirosis, a zoonotic disease caused by spirochetes of genus Leptospira. It has a worldwide distribution and is common in the humid tropical and subtropical areas, where most developing countries are found. It is a greater problem in tropical countries than those with a temperature climate. Outbreak mostly occur as a results of heavy rainfall and consequent flooding.[41]Till 1980 ,very few reports on Leptospirosis originated from India. This is in spite of fact that the isolation of the causative organism in India was first reported in 1931 by Taylor & Goyle from Andaman & Nicobar Islands.[50]Leptospirosis is a potentially serious but treatable disease. So early diagnosis and prompt treatment is necessary to improve outcome. Leptospirosis is now being an emerging infectious disease that is spreading from its traditional rural to urban areas .At the same time, the number of reports of severe Leptospirosis associated with pulmonary haemorrhage and ARDS with high fatality is increasing on recent years. Leptospirosis is very common form in south Gujarat since last few years, particularly its occurrence in rainy season in the month of July to September. During this period, farm worker acquire infection while working in farm. Pulmonary symptoms are common in icteric cases, so high degree of suspicion , early recognition and prompt referral to higher centres with facility of mechanical ventilator is necessary to because to decrease mortality.

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RESULT:

TABLE 1: AGE AND SEX DISTRIBUTION

AGE (YRS)	MALES NO(%)	FEMALES NO(%)	TOTAL NO (%)
≤ 20	9 (9%)	1(1%)	10 (10%)
21-30	24 (24%)	6 (6%)	30 (30%)
31-40	27 (27%)	1 (1%)	28 (28%)
41-50	13 (13%)	6 (6%)	19 (19%)
51-60	11 (11%)	1 (1%)	12 (12%)
>60	1(!%)	0 (0)	1 (1%)
TOTAL	85(85%)	15(15%)	100 (100%)

Above table shows that male :female ratio was 5.6:1, maximum no of patients were age group 21-30 years.

TABLE 2: CLINICAL FEATURES

CLINICAL FEATURES	NO OF PATIENTS (n =100)(%)
Fever	98 (98%)
Mylagia	86 (86%)
Jaundice	74 (74%)
Oliguria	53 (53%)
Cough	38 (38%)
Breathlessness	39 (39%)
Hemoptysis	21 (21%)
Headache	18 (18%)
Subconjuctival suffusion	41 (41%)
Abdominal pain	06 (06%)
Diarrhoea	06 (06%)
Dehydration	14 (14(%)
Stupor	05(05%)

Above table shows that fever was commonest symptoms on presentation observed in 98% of cases, while Mylagia, jaundice, Oliguria observed in 86%,74%,53%of cases respectively. Pulmonary symptoms like breathlessness and haemoptysis were observed in 39% and 21% of cases respectively. Cough was observed in 38% of cases. Headache was also common presenting feature and was observed in 18% of patients.

TABLE 3: ORGAN / SYSTEM INVOLVEMENT

ORGAN / SYSTEM INVOLVEMENT	NO OF PATIENTS (n=100) (%)
Pulmonary	39 (39%)
Liver	74 (74%)
Renal	65 (65%)
Cardiovascular	16 (16%)
Musculoskeletal	86 (86%)
Haematological	74 (74%)
CNS	05(05%)

Out of 100 patients ,86(86%) patients had musculoskeletal system involvement ,74(74%) patients had liver as well as haematological involvement ,65(65%) patients had renal involvement ,39 (39%) patients had pulmonary involvement ,16 (16%) had cardiovascular involvement and 5 (5%) patients had nervous system involvements. Hepatic involvements was very frequents and observed clinically as jaundice(74%),tendeeness in right hypochondrium and hepatomegaly.CNS was least to involve (5%) of cases.

TABLE 4: PULMONARY INVOLVEMENT

Pulmonary manifestation	Total no of pt.(n=100)(%)
Tachypnea RR <25 RR ≥ 25	 61(61%) 39 (39%)
SPO2 ≥ 90% < 90%	 70 (70%) 30(30%)
Cough	38(38%)
Breathlessness	39(%)
Haemoptysis	21(21%)
B/L crepitations	35(35%)

Pulmonary involvements although observed infrequently in other countries, were found very frequently in India and so in our study.

TABLE 5: COMPLICATIONS OF PULMONARY INVOLVEMENTS

COMPLICATION	No of pt (n=39) (%)	No of pt expired (%)
ARDS	34 (82%)	23(87%)
Alveolar haemorrhage	20(51%)	20(100%)

We have observed that once patients starts developing severe pulmonary complications like ARDS and alveolar haemorrhage, the possibilities of acute respiratory failure and death were high. It has been observed that the mortality in such cases is quite high even after using intensive measure like mechanical ventilation.

Table no 6:
RELATION BETWEEN ARF AND PULMONARY INVOLVRMENT

Patients with	Pulmonary involvement		Non pulmonary involvement		P value
	Cases (n=39)	Expired (%)	Cases (n=61)	Expired (%)	
ARF	32(82%)	20(62.5%)	39(64%)	2(5%)	< 0.001
NO ARF	7(18%)	3(43%)	22(36%)	0	NP
MYOCARDITIS	7(18%)	4(57%)	9(15%)	1(11%)	>0.05
NO MYOCARDITIS	32(82%)	19(59.4%)	52(85%)	1(2%)	< 0.001
JAUNDICE	31(79%)	19(61%)	43 (70.5%)	2(4.5%)	<0.001
NO JAUNDICE	8(20%)	4(50%)	18(29.5%)	00	>0.05

Above table shows that 32(82%) patients of ARF had pulmonary involvement and out of which 20 (62.5%) patients were expired while 39 (64%) patients had ARF without pulmonary involvement and only 2 (5%) patients were expired

and difference is highly significant statistically. K Niwattyakul et al (2000) Observed incidence Of ARF and pulmonary complications in 74% of patients and it was associated with high mortality which correlated with our study.

Above table also shows that the out of 39 patients,7 (18%) patients had myocarditis along with pulmonary involvement did not have myocarditis.9 (15%) patients had only myocarditis without pulmonary involvement and 52 (85%) patients had neither myocarditis nor pulmonary involvement. 4(57%) patients expired who had myocarditis with pulmonary involvement and only 1(11%) patients expired who had only myocarditis and difference is not significant. In above table there is 31 patients with pulmonary involvement and jaundice, 19(61%) patients were expired and only 2 (4.5%) patients were expired of jaundice without pulmonary involvement and the difference is statistically highly significant. A De eta al (2000) 1& Claude yersin et al (1996)4 observed that association of pulmonary involvement with jaundice carries high mortality which is comparable to our study.

TABLE 7: MECHANICAL VENTILATOR

	Total no of patients (n=39)(%)	Total no of patients expired (%)
Invasive ventilation	23(59%)	23(100%)
Non invasive ventilation	06(15.5%)	00
High flow oxygen	10(25.5%)	00

(p value <0.001)

In our study, out of 39 patients who developed pulmonary symptoms , 23 (59%) patients were put on invasive mechanical ventilator while 6 (15.5%) were put on non invasive mechanical ventilator and 10(25.5%) patients were given high flow oxygen. All the patients put on invasive on invasive mechanical ventilator were expired to severe respiratory distress and alveolar haemorrhage.

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TABLE 8: PLASMAPHERESIS

	Total no of patients (n=39)(%)	Total no of patients expired (%)	P value
Plasmapheresis	20 (51%)	8(40%)	<0.01
Plasmapheresis not done	19(49%)	15(79%)	

In our study out of 39 patients who has developed pulmonary symptoms ,Plasmapheresis was done in 20 (51%) of patients and among them 8 (40%) patients were expired..Plasmapheresis was not done in 19 (49%) patients and among them 15(79%) were expired.

TABLE 9: MORTALITY

	Patients with pulmonary involvement	Patients without pulmonary involvement	P value
Total patients	39	61	<0.001
Total patients expired (%)	23(59%)	2(3.3%)	

Above table shows that mortality rate for pulmonary involvement is 59% in our study which is comparable to the study of Silvia R R Vieira et al (2000)14 with mortality rate of 51%.

TABLE 10: MULTI ORGAN INVOLVEMENT

Patients with	Total patients (n=39)	Survivors (%)	Non survivors (%)
Only pulmonary involvements	00	00	00
Pulmonary + 1 organ System involved	01(2.5%)	01(100%)	00
Pulmonary +2 organ System involved	07(18%) A De A Varaiya	06(86%)	1(14%)
Pulmonary +3 organ System involved	17(43.5%)	6(35.3%)	11(64.7%)
Pulmonary +4 organ System involved	13(33%)	3(33%)	10(77%)
Pulmonary +5 organ System involved	1(2.5%)	00	1(100%)

From above able ,it is observed that none of the patient had only pulmonary involvement While 17(43.5%) patients with 3 organ system involved along with pulmonary involvement has mortality rate was 64.7% and 13(33%) patients with 4 organ system involvement along with pulmonary involvement has mortality rate was 77%.Only1 (2.5%) patient had 5 organ system involved along with pulmonary involvement and mortality was 100%.7 (18%) patients had 2 organ system involved with pulmonary involvement and mortality was 14% .Only 1(2.5%) had pulmonary involvement with 1 organ system involved and no mortality observed in this group A De et al (2000)1 observed that hepatic (47.6%) & renal (28.5%) involvement along with pulmonary involvement was significantly associated with high mortality. S A Divate et al (2002) 11 observed that death in Leptospirosis were usually associated with sever jaundice, oliguric renal failure and pulmonary alveolar haemorrhage.

CONCLUSION:

Pulmonary involvement is one of the common modes of presentation in Leptospirosis in south Gujarat. Breathlessness ,cough, and haemoptysis are common pulmonary symptoms on presentation .ARDS and alveolar haemorrhage are important complications of pulmonary involvement in Leptospirosis and associated with high mortality .Plasmapheresis is a newer modality of management in pulmonary involvement with Leptospirosis and has promising results and can be tried in future.

REFERENCE

1) A De Varaiya et al : an outbreak of Leptospirosis in Mumbai .Indian J of Medical Microbiology ,(2002) 20 (3): 153- 155. | 2) A.M .Clerk et al : clinical profile of Leptospirosis in south Gujarat , J PG Med,2002 ,Vol 48, issue 2 117-8. | 3) Abraham Ittyachen , V.K. Lakshmanakumar et al : Methylprednisolone as adjuvant in treatment of acute respiratory distress syndrome owing Leptospirosis – a pilot study. Indian J critical care med, July –September, 2005 volume -9 issue 3,133-136. | 4) Claude yersin ,pascal Bovet et al :Human Leptospirosis in the Seychelles (Indian ocean): A population based study ,Am J Trop Med & Hyg, 59(6) 1998 ,933-940. | 5) K. Niwattyakul et al :Hypotension ,renal failure and pulmonary complication in Leptospirosis ,Ren. Faq:2002 May ; 24(3): 297-305. | 6) M A Muthusthupati S Shivkumar et al :Leptospirosis in madras – a clinical and serological study , japi 1995, vol 43 ,no 7 ,456-458. | 7) Park's textbook of preventive and social mesdicine 17th edition 222-223. | 8) S S Sehgal M V Mrhekar et al :Outbreak of Leptospirosis with pulmonary involvement in north Andeman ,Ind J Med Res ,102 , July 1995: 9-12. | 9) S A Divate , R Chaturvedi et al :Leptospirosis associated with diffuse alveolar haemorrhage , JPGM 2002; Vol 48 issue 2 ,131-2 | 10) S C Sehgal , P, Vijayachari , A Sinha, A P Sugunan ,M A Rashad and S C Sehgal : Clinico – epidemiological study of hospitalized cases of sever Leptospirosis : Indian j med Res, March 1999, vol 109, 94-99. | 11) S Ramchandran , M V F Perera : cardiac and pulmonary involvement in Leptospirosis , Royal society of Trop Med and Hyg , volume 71, no:1, 1977:56-9. | 12) S. Borwankar RV Poere , RB Gurav,S. Kartikeyan :Sero positivity for Leptospirosis - A pilot study. http / www.bhj.org/journal/2001 -4304- 0ct /org -527.htm. | 13) S. Gopalkrishnan ,S Raghunathan et al : Clinical profile of Leptospirosis , JAPI, 1999 vol 47;n0 1,58- 9. | 14) Silvia RR Vieria ,Janete S Brauner : Leptospirosis as a cause of acute respiratory failure: Clinical features and outcome in 35 critical care patients ,Braz J Infect Dis Vol 6 ,no 3, Salvador June 2002. | 15) Thammakumpee K, Silpapojakul Ket al :Leptospirosis and its pulmonary complication ,Entrez pub med. |