

## Study of Routine Biochemistry Analytes in Leptospirosis for Evaluating Organ and System Specific Involvement

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**Abstracts:** During 1988-1997 there were 527 cases of Leptospirosis out of which 104 were fatal in south Gujarat, mainly due to liver and renal failure. Pulmonary involvement, though uncommon, led to high mortality. 90% present of patients of leptospirosis have anicteric leptospirosis while only 10% patients of leptospirosis have icteric leptospirosis, a more severe type. **Methods and Results:** Laboratory reports of samples of patients of Leptospirosis from July 2010 to August 2011 at Biochemistry laboratory of New Civil Hospital were collected from the Laboratory Database. **Result:** Out of 1293 number of samples of Leptospirosis patients, received at Biochemistry laboratory of New Civil Hospital, Surat. ALT in 71.4 %, Total Bilirubin in 71.8 %, Direct Bilirubin in 89.7 %, Creatinine in 64.3 % and Amylase in 72 % were found elevated. This study shows that 63% of patients have abnormal Liver function and 78% of patients with pancreatic involvement in agreement with a study by Atanasova M G which shows that increased amylase levels are seen in 41.67% of mild cases, in 25% of moderate cases and in 88.24% of severe cases. **Conclusion:** This study shows that majority of cases of leptospirosis at New Civil Hospital Surat (a tertiary care centre) are icteric leptospirosis and a large majority of them have pancreatic involvement. [Tailor P NJIRM 2014; 5(4) :44-46]

**Key Words:** Tuberculous Meningitis, Oculomotor Nerve Palsy

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**Introduction:** Leptospirosis is disease caused by the bacteria *Leptospira interrogans*. The first of its kind in India was reported in the 1920s from Andaman and Nicobar Islands. After this report, no case was reported until 1988. However, during 1988-1997, there were 527 cases of Leptospirosis, out of which 104 were fatal. The incidence of the disease is increasing in Tamil Nadu, Kerala, Karnataka and Maharashtra though no part of the country is free from this disease. There were four outbreaks of the disease during 1997 in Mysore, Surat, North Andaman and Nagpur, causing 39 deaths. In south Gujarat, 20 % of the 509 leptospirosis patients died in 2010. Liver and kidney were the most commonly involved organs in severe leptospirosis. Pulmonary involvement, though uncommon, lead to high mortality. [3] Leptospirosis has claimed the lives of 104 people in the area around Surat, Gujarat, in last July-September 2011.

90% patients of leptospirosis have anicteric leptospirosis while only 10% patients of leptospirosis have icteric leptospirosis<sup>[1]</sup>. Moreover icteric leptospirosis tends to be more severe than anicteric leptospirosis. Renal involvement is almost invariably present in leptospirosis. Pulmonary involvement is a major cause for mortality among patients of leptospirosis. <sup>[3]</sup> Cardiovascular

involvement includes Disseminated Intra-vascular Coagulation (Secondary to liver involvement leading to coagulation factor deficiency). Because of severe thrombocytopenia, patients may have spontaneous superficial bleeding i.e. petechial, purpura, epistaxis or GIT bleeding. In severe cases, ecchymosis or intra-cranial haemorrhage can occur.

From primary center, patient fitting in recommended case-definition of leptospirosis, acute febrile illness with headache, myalgia and prostration associated with any of the symptoms like conjunctival suffusion, oliguria, jaundice, hemorrhages, cardiac arrhythmia or failure, skin rash and a history of exposure to infected animals or an environment contaminated with animal urine, are referred to tertiary health center as suspected case of leptospirosis.<sup>[4]</sup> Out of all suspected case, 80% case were labeled confirm leptospirosis through various test like immunological antibody test or PCR.

**Aim:** To evaluate organ and system specific involvement in Leptospirosis by analyzing routine biochemistry analytes from blood samples.

**Objectives:**

- Collect retrospective laboratory data of biochemical analysis of patient sample of leptospirosis from biochemistry laboratory New Civil Hospital Surat, Gujarat.
- Analyze obtained data for organ and system involvement

**Material & Method:**

Laboratory reports of samples of patients of Leptospirosis from July 2010 to August 2011, analyzed at clinical biochemistry laboratory of New Civil Hospital, Surat were collected from the Laboratory Database.

The data was analyzed for results of serum ALT, Bilirubin, Creatinine, Urea, Amylase and Lipase. Average and range of these analytes, percentage of

patients with abnormal results for each analytes and organ-system involvement were found.

**Results:** During July 2010 to August 2011, 1293 number of samples of Leptospirosis patients were received at Biochemistry laboratory of New Civil Hospital, Surat. Table 1 shows average and range of results for various analytes. Elevated total bilirubin as well as direct bilirubin was considered as abnormal Liver Function. Elevated creatinine was considered as abnormal Renal Function. Elevated amylase was considered as abnormal pancreatic function. Table 2 shows classification of samples based on organ-system involvement, abnormal liver function test, renalfunction test & pancreatic function test. Table also shows percentage of multisystem involvement.

**Table 1:**

	ALT	Total Bilirubin	Direct Bilirubin	Albumin	Protein	Creatinine	Urea	Amylase	Lipase
Average Value	66.3	7.2	5.8	2.7	5.7	2.7	89.2	493.3	481.0
% of Abnormal value	71.4	71.8	89.7	68.0	86.2	64.3	64.5	72.0	100.0
Minimum Value	4	0.1	0.0	0.8	1.8	0.1	10.0	6	55.0
Maximum Value	1370	55.6	53.1	4.2	48.0	11.3	322.0	3993	1123.0

**Table 2:**

	Liver Function	Renal Function	Pancreatic Function	Liver & Renal Function	Liver & Pancreatic Function	Renal & Pancreatic Function	Liver, Renal & Pancreatic Function
Total Number	944	1099	304	891	249	252	242
Abnormal	593	641	238	304	95	116	93
% of Abnormal	63	58	78	34	38	46	38

**Discussion:** This study shows that 63% of patients have abnormal Liver Function unlike report from WHO <sup>[1]</sup> which says that only 10% of patients have icteric leptospirosis. The data in present study are obtained at a tertiary teaching hospital where only severe cases (mainly icteric leptospirosis) are

referred. This explains over-representation of abnormal LFT in the study population. WHO do not mention pancreatic involvement as a common feature of leptospirosis clinical spectrum <sup>[1]</sup>. While this study shows 78% of patients with pancreatic involvement, in agreement with a study by

Atanasova M G which shows that increased amylase levels are seen in 41.67% of mild cases, in 25% of moderate cases and in 88.24% of severe cases.<sup>[2]</sup>

**Conclusion:** This study shows that majority of cases of leptospirosis at New Civil Hospital Surat (a tertiary care centre) are icteric leptospirosis and a large majority of them have pancreatic involvement.

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