



## A study on few biochemical parameters of clinically suspected and laboratory confirmed *Leptospirosis* cases

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**Abstract:** A study on biochemical parameters in clinically suspected and laboratory- confirmed leptospirosis cases was conducted in the Union Territory of Dadra and Nagar Haveli. Out of 50 clinically suspected samples of leptospirosis, 38% were positive from both ELISA IgM and rapid card test. In the present study, liver markers such as bilirubin, Serum Glutamate Oxalo acetic Transaminase (SGOT) and Serum Glutamate Pyruvic Transaminase (SGPT) encountered elevation 68%, 100% and 89% respectively in leptospirosis positive patient while 89% and 48 % of positive patients showed elevation in kidney marker, creatinine and blood urea. On the basis of liver and renal functions, a hospital can develop its own clinical algorithm to suspect the case of leptospirosis.

**Keywords:** Biochemical parameters, Immunochromatography, SGOT, SGPT, Leptospirosis

### INTRODUCTION

Leptospirosis is an infectious disease caused by pathogenic organisms belonging to the genus *Leptospira* that are transmitted directly or indirectly from animals to humans. Human-to-human transmission of leptospirosis occurs very rarely (Levett, 2001). The infection is commonly transmitted to humans by water contaminated by animal urine to come in contact with unhealed breaks in the skin, the eyes, or with the mucus membrane. *Leptospira* can cause wide range of clinical manifestations, from a mild, flue-like illness to a severe disease form, characterized by multi-organ system complications leading to death (WHO, 1999). Apart from humans, at least 160 mammalian species are infected like rats, cattle, pigs, buffaloes, horses, sheep, goats, squirrels, bandicoots and raccoons. It is most commonly found in tropical or subtropical countries and may be prevalent in both urban and rural regions. Most outbreaks of leptospirosis are reported in coastal regions: Gujarat, Mumbai, Kerala, Chennai and the Andaman Islands (Meenakshi *et al.*, 2009 and Sethi *et al.*, 2010). It is known that leptospirosis is widespread in farm and domestic animals in many parts of India (WHO, 1999), including the North-East, West Bengal, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, Punjab and Haryana (Charoonruangrit and Boonpucknavig, 1964;

Mamutha sethupathi *et al.*, 1995; Patel *et al.*, 2006; Sugunan *et al.*, 2009 and Velineni *et al.*, 2007). Every year in the season of monsoon, Surat, Navsari, Valsad and Dadra and Nagar Haveli regions of western India are mainly affected from the leptospirosis. The purpose of present investigation, to determine the involvement of liver and kidney in leptospirosis positive patient.

### MATERIALS AND METHODS

Fifty Single or paired samples of clinically suspected leptospirosis patients were collected at Sri Vinoba Bhave Civil Hospital Silvassa during November 2011 to January 2012 and tested by Rapid card test working on the principle of immunochromatography, a unique two-site immunoassay on a membrane ( Leptocheck Zypher Inc.). As the test sample flows through the membrane assembly of the test device, the anti-human IgM colloidal gold conjugate forms a complex with IgM antibodies in the sample. This complex moves further on the membrane to the test window 'T' where it is immobilized by the broadly reactive *Leptospira* genus specific antigen coated on the membrane, leading to the formation of a red to deep purple colored band at the test region. 'T' which confirms a positive test result. All rapid card screened samples were tested by IgM ELISA for confirmation. All ELISA IgM positive samples were considered as leptospirosis confirmed cases. All biochemical parameters of liver

**Table 1.** Showing abnormality in the function of liver and kidney in Leptospirosis positive patients.

Function	Parameters	Elevated value in Leptospirosis positive patient (%)
Liver	SGOT (U/L)	100
	SGPT (U/L)	89
	Bilirubin (mg/dL)	68
Kidney	Creatinine (mg/dL)	89
	Blood Urea (mg/dL)	49

and kidney was tested by fully automated biochemistry analyzer (Xpand Plus, Semens inc)

## RESULTS AND DISCUSSION

Only thirty eight percent of the total clinical suspected cases were found positive for leptospirosis (n = 50). The maximum patient of leptospirosis was reported hepatic and renal dysfunction. The elevated indicator of abnormal liver function SGOT, SGPT and bilirubin were encountered 100% 89% and 68 % in leptospirosis positive patient. In case of abnormality in the function of kidney, it was observed that 89% patients have elevated creatinine values and 49% patients have significantly increased values of blood urea (Table 1). It has also been observed that there were abnormal biochemical changes in both the liver as well as renal functions in 89% of laboratory confirmed cases. The value of abnormality in liver and renal function of laboratory negative cases was lesser in contrast of positive cases.

Leptospirosis is a major public health problem in tropical countries with potentially fatal systemic complications and multiorgan dysfunction, including hepatic and renal failure, with or without severe pulmonary hemorrhage syndrome (Levett *et al.*, 2001). The abnormality due to leptospirosis in the liver and kidney have been reported time to time, In present investigation, the level of abnormality in liver and renal function in leptospirosis confirm cases corresponds with the studies conducted by Sethi *et al.* (2010), where 73% patients (63 out of 86) were with abnormality in the liver and kidney function. On other hand, only 35% patients were found with symptoms of abnormality in the liver and kidney by Prabhu *et al.* (2010), while only three patients (13%) had abnormality in liver and kidney function during an outbreak in Germany (Desai *et al.*, 2009).

Thus, it was concluded that the abnormal liver and renal function may be considered as an indicator of suspicious case of leptospirosis in highly endemic region and on the basis of elevation of abnormality in the liver and renal functions of suspected case, a hospital can develop their own clinical algorithm towards the confirmation of leptospirosis.

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