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**CASE SERIES****Weil's disease: A rare presentation of severe leptospirosis with multi-organ involvement***Peetam Singh<sup>1\*</sup>**<sup>1</sup>Department of Microbiology, Subharti Medical College,  
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**Abstract**

Leptospirosis is the disease caused by *Leptospira interrogans*, the only pathogenic species of genus *Leptospira* among spirochaetes. The other species of the genus *Leptospira* are not considered as pathogenic to humans. The spectrum of disease caused by *Leptospira interrogans* ranges from milder forms of the disease known as leptospirosis to severe forms known as ictero-haemorrhagic fever or Weil's disease. The involvement of multiple organs is rarely reported in leptospirosis. This is a series of three cases of severe leptospirosis with multi-organ involvement due to *Leptospira interrogans* from a tertiary level hospital from Uttar Pradesh, India. All the cases were having the history of contact with contaminated environment and were positive on rapid immunochromatographic test, which was further confirmed by ELISA.

**Keywords:** *Leptospira interrogans*, severe leptospirosis, Weil's disease, ictero-haemorrhagic fever

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**Introduction**

Leptospirosis is a zoonotic infection due to a spirochaete *Leptospira interrogans* (*L. interrogans*) [1]. It is most commonly transmitted due to contaminated urine from the host animals carrying the *L. interrogans* transmitting infection to humans either directly via the skin or ingestion [2]. Human leptospirosis can be seen as varied presentation from mild asymptomatic infections to life-threatening serious complications involving multiple organs including liver, kidneys, and lungs [3]. Weil's syndrome is a severe form of leptospirosis which is associated with high mortality and morbidity characterized by hepatic dysfunctions with or without haemorrhages and renal failure [4]. Severe form of leptospirosis can result in life threatening condition, so these patients should be investigated for early diagnosis and institution of intensive medical care to prevent further complications and mortality. The pathogenesis and risk

factors of Weil's disease are currently not known clearly while antimicrobial chemotherapy is the preferred treatment modality for these cases. Due to delayed diagnosis, some patients of leptospirosis often develop life threatening organ dysfunction in the form of liver, kidney, or lung involvement commonly known as Weil's disease. There may be involvement of multiple organs but rarely reported, leading to unusual presentation of the disease [3, 5]. This series presents three cases of severe forms of the disease with multi-organ involvement from Uttar Pradesh, India.

**Case 1**

A 32-year-old male presented with the fever of 10 days duration which was continuous in nature without any variation which was associated with body aches, vomiting, and headache followed by diarrhea, decreased oral intake, weakness over extremities, and slurred speech. There was history of

conjunctivitis for 5 days and history of travel to rural areas of northern Madhya Pradesh for recreational activities before 7 days of onset of the symptoms.

### Case 2

A 27-year-old male presented with fever of seven days duration with altered sensorium. This patient was a farmer by occupation and belonged to the rural area of Uttar Pradesh, frequently engaged in rearing and caring of livestock. There was history of swimming in a water reservoir (pond) along with domestic animals.

### Case 3

A 28-year-old male presented with fever of 10 days duration with hematuria, shortness of breath, generalized body pain, vomiting for 10 days and loss of consciousness for two days. There was history of travel and contact with water reservoir after rainy season.

In all the three cases, IgM antibodies against *Leptospira* were detected by sandwich immunoassay using Leptocheck by TULIP Diagnostics and further confirmed by detection of IgM antibodies by ELISA using Panbio *Leptospira* IgM ELISA by Abbott. All the three cases were enquired about past history relevant to the clinical condition and investigated further to find out the etiology. The summary of all the three cases is summarized in Table 1.

### Discussion

Leptospirosis is among the important etiologies of acute febrile illnesses and one of the widespread and dangerous zoonosis in the world. The severe leptospirosis also known as Weil's disease or Weil's syndrome or ictero-hemorrhagic fever, is life threatening and main cause of death due to delayed diagnosis resulting in delayed institution of

antimicrobial treatment. One of the important reasons behind delayed diagnosis is the lack of awareness leading to lack of suspicion among clinicians especially in the non-endemic areas. Weil's disease involves liver, kidneys, or lungs which form the "triad" of target organs involved in leptospirosis. There may be the involvement of other organs such as CNS and pancreas which are rarely seen [2, 4]. There are studies highlighting the various complications and organ involvement in leptospirosis, but there are only few reports highlighting the severe forms of the disease with multi-organ involvement [6-7]. This case series represents the rare combination of neuroleptospirosis along with the involvement of other organs which is the unique series of cases of its type from Uttar Pradesh. All these leptospirosis cases were also evaluated by utilizing the modified Faine's criteria for the diagnosis of leptospirosis including clinical data, epidemiological factors and laboratory findings [8]. The clinical data in the form of fever, headache, subconjunctival hemorrhage, conjunctival suffusion, or features of aseptic meningitis along with the epidemiological factors are important constituents of the modified Faine's criteria highlighting the significance of these associated factors with zoonotic transmission of the disease especially contact with contaminated environment and history of rainfall [9]. All these cases were also having the significant history of environmental factors associated with them along with the clinical profile. The lack of suspicion and awareness among clinician and lack of studies on leptospirosis from a particular geographical area complicates the scenario leading to delayed investigations and delayed diagnosis. The involvement of various organs is mainly due to delayed institution of antimicrobial treatment due to

Table 1: Summary of all cases

Patient Details	Case 1	Case 2	Case 3
Age (years)/ Gender	32/ Male	27/ Male	28/ Male
Clinical profile	Fever, pain abdomen, generalized body pain, headache, vomiting, diarrhea, decreased oral intake, weakness over extremities, slurred speech, sub-conjunctival hemorrhage, icterus, pallor, signs of meningeal irritation present	Fever, altered sensorium, pallor, icterus, signs of meningeal irritation present	Fever, hematuria, shortness of breath, generalized body pain, vomiting, loss of consciousness, pallor, icterus, hemoptysis, signs of meningeal irritation present
History of contact with contaminated environment	History of travel to prevalent area, history of contact with contaminated environment	History of contact with contaminated environment	History of travel to prevalent area; history of contact with contaminated environment
Month/ Season of exposure	July; Monsoon Season	September; Post-monsoon season	August; Monsoon Season
Underlying conditions/ Comorbidities	None	None	None

Continued...

<b>Investigation profile</b>	Leptospira IgM-Positive, Scrub Typhus IgM-Negative, Widal test-Negative, Dengue NS1, IgM and IgG-Negative, Chikungunya IgM, IgG- Negative Malarial parasite- Not detected, Viral markers- Non-reactive, C-Reactive Protein- Positive, Urine- Blood present, R.B.C.-20-22/HPF, Thrombocytopenia, TLC- 13400/microliter, Serum Amylase- Raised, Serum Lipase- Raised, Serum Urea and Creatinine- Raised, SGOT/ SGPT- Raised, Electrolytes- Normal	Leptospira IgM-Positive, Scrub Typhus IgM-Negative, Widal test-Negative Dengue NS1, IgM and IgG-Negative, Chikungunya IgM, IgG- Negative Malarial parasite- Not detected, Viral markers- Non-reactive, C-Reactive Protein- Positive, Urine-Normal, Thrombocytopenia, TLC- 10200/microliter, Serum Amylase- Raised, Serum Lipase- Raised, Serum Urea and Creatinine- Normal, SGOT/ SGPT- Raised, Electrolytes- Normal	Leptospira IgM-Positive, Scrub Typhus IgM- Negative, Widal test- Negative Dengue NS1, IgM and IgG- Negative, Chikungunya IgM, IgG- Negative malarial parasite- Not detected, Viral markers- Non-reactive, C-Reactive Protein- Negative, Urine- Blood present, R.B.C.-15-20/HPF, Thrombocytopenia, TLC- 14700/microliter, Serum Amylase- Raised, Serum Lipase- Raised, Serum Urea and Creatinine- Raised, SGOT/ SGPT- Raised, Electrolytes- Normal
	Aerobic Culture of Urine, Blood and CSF revealed no growth	Aerobic Culture of Urine, Blood and CSF revealed no growth	Aerobic Culture of Urine, Blood and CSF revealed no growth
<b>Clinical Diagnosis</b>	Severe leptospirosis with Pancreatic, Hepatic, Renal and CNS involvement	Severe leptospirosis with Pancreatic, Hepatic and CNS involvement	Severe leptospirosis with Pancreatic, Hepatic, Renal, Pulmonary and CNS involvement
<b>Antimicrobial therapy</b>	Penicillin G, Ceftriaxone	Penicillin G, Ceftriaxone	Penicillin G, Ceftriaxone
<b>Follow-up and outcome</b>	Recovered and discharged after 15 days	Recovered and discharged after 20 days	Recovered and discharged after 21 days

CNS- Central Nervous System, CSF- Cerebrospinal Fluid, RBC- Red Blood Corpuscles, TLC- Total Leucocyte Count

delayed diagnosis. The delayed diagnosis of these types of complications results in longer duration of treatment and hospital stay, higher morbidity and mortality ultimately leading to undue economic burden to the community.

### Conclusion

Leptospirosis is a common tropical disease which can involve vital organs. The involvement of

multiple organs is not a common entity but in the presence of multi-organ involvement and fever needs investigations to rule out Weil's disease. Any patient having acute febrile illness in presence of epidemiological factors and negative for other etiologies of febrile illnesses of acute origin and negative on culture should be investigated further for leptospirosis.

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