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Case Report

Leptospirosis-induced transverse myelitis and multiorgan failure: an uncommon manifestation in non-epidemic setting

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ABSTRACT

Leptospirosis is a disease that can be transmitted from animals to humans. It is caused by a bacterium called Leptospira interrogans and is more common in tropical and subtropical regions. Despite being the most neglected tropical disease, it is a significant emerging and re-emerging disease, according to recent reports and reviews by the World Health Organization (WHO). Leptospirosis is widespread among humans and animals globally, and it is estimated that there are 1.03 million cases and 58,900 deaths annually, with a case fatality rate of 6.85%. Acute transverse myelitis (TM) is a rare neurological disease that affects the spinal cord. It is caused by various autoimmune reactions and is usually limited to several spinal cord segments. It has a poor prognosis. Our case report presents a unique situation where a patient developed multiorgan failure due to leptospirosis and also had a rare co-presentation of transverse myelitis.

Keywords: Clinical manifestation, Infectious disease, Leptospirosis, Multiorgan failure, Transverse myelitis

INTRODUCTION

Leptospirosis is a zoonotic disease caused by the spirochete known as leptospira interrogans. The disease is prevalent in tropical and subtropical regions.[1] The burden of the disease is estimated to be 1.03 million cases and 58,900 deaths annually, with a case fatality rate of 6.85%.[2] The main reservoir for leptospirosis is mammals, and the most significant carrier is rats. It is transmitted to humans when an abrasion on the skin or mucous membrane comes into direct contact with water contaminated with rat urine. Other risk factors for transmission include poor sanitation, recreational exposure during water sports, farmers having contact with livestock, and natural disasters associated with floods.[3] The incubation period of the disease ranges from 7 to 12 days. The symptoms range from a mild flu-like illness to severe life-threatening multiple-organ involvement. Most cases present with non-specific flu-like symptoms such as high-grade fever, chills, bi-temporal headache, muscle pain, and tenderness. These symptoms resemble other acute febrile illnesses like influenza, malaria, and dengue fever. However, a more characteristic feature of leptospira is the involvement of ocular symptoms like conjunctival suffusion, subconjunctival hemorrhage, and scleral icterus.[4,5] About 10% of patients develop Weil's syndrome, a severe form of leptospirosis characterized by renal failure, liver dysfunction, and hemorrhages.[6] Leptospirosis with multiple organ failure and transverse myelitis is very rare. In this paper, we report such a severe case.

CASE REPORT

A 35-year-old female patient from South Asia, residing in Peshawar, came to us with a recurring fever that had lasted for 26 days. She had been experiencing bilateral lower limb pain and weakness for the past three weeks, along with urinary retention for the past two days. During physical examination, she appeared pale and dehydrated, and we found a palpable bladder. Following a neurological examination, we discovered that she had decreased power and tone in her bilateral lower limbs, with absent reflexes. We conducted subsequent testing, and the results are shown in Tables 1 and 2. We found that the patient's liver functions were deranged, and renal function tests showed an increased creatinine level. Her CBC showed a decreased platelet count, while d-Dimer and C-reactive protein levels were elevated. Echocardiography revealed a hypokinetic left ventricle with a lower ejection fraction, and the anti-troponemal antibody test was positive.

Table 1: Full blood workup, anti-troponemal antibody titre and ejection fraction of the patient.

Lab tests	Reference range	Patient findings
C-reactive protein	<0.5	16.0
Platelet count	150-450	50
D dimer	500 ng/ml	2309 ng/ml
Ejection fraction		46%
LDH	80-235 U/l	1900 U/l
Creatinine kinase	0-166 U/l	9261 U/l
Creatinine	0.42-1.06 mg/dl	5.57 mg/dl
Uric acid	2.-5.7 mg/dl	11.5 mg/dl
Anti-treponemal antibody titer	<1:1	1:32

Table 2: Liver function test of the patient.

Liver function tests	Reference range	Patient findings
Total bilirubin	0.1-1.0 mg/dl	3.47 mg/dl
Alanine transaminase (ALT)	10-50 U/l	245 U/l
Alkaline phosphatase	35-104 U/l	136 U/l

The nerve conduction tests showed lower limb weakness. Imaging studies, as shown in Figure 1, revealed that spinal MRI showed lower thoracic cord expansion with T2 high signals from D15 to D12. The nerve conduction test and MRI results confirmed her diagnosis of transverse myelitis as a complication. The patient was administered injections of meropenem and ceftriaxone for a week, which slightly improved her symptoms. To alleviate her urinary symptoms, a urine catheter was inserted, and her medication was changed to doxycycline after confirming anti-treponemal antibodies. Additionally, she was given neurobion and methyl prednisone to enhance her neurological function. Based on clinical, laboratory, and imaging studies, she was diagnosed with complicated leptospirosis with transverse myelitis. After 21 days of management, her RFT, LFT, and platelet counts improved, but her neurological weakness persisted. This case of leptospirosis with multiorgan involvement is an unusual occurrence that we have presented here.

Figure 1: T2 high signals from D15 to D12, indicating thoracic cord expansion in MRI spine.

DISCUSSION

Leptospirosis is a neglected tropical disease that has been identified as a major emerging and re-emerging disease by the World Health Organization (WHO).[7] It is widespread among humans and animals globally and has a large distribution due to the vast range of mammalian hosts, globalization, and climate change. The disease is estimated to cause 1.03 million cases annually, making it one of the most prominent zoonotic causes of morbidity and mortality. Despite its high incidence in South and Southeast Asia, it remains under-reported due to poor surveillance.[8] In this report, we present a case of leptospirosis in a 35-year-old patient from South Asia. Initially, the patient was not suspected to have leptospirosis as she presented with lower limb weakness, and neurological examination revealed absent reflexes. She was treated as a case of transverse myelitis, a rare neurological disease with a poor prognosis that is usually limited to several spinal cord segments.[9] However, further investigation revealed leptospirosis with

complications. The clinical severity of leptospirosis can vary from subclinical disease to severe multiorgan failure. In this case, the patient was treated as a case of leptospirosis with its complications and its rare presentation with transverse myelitis. We present this rare case report to the medical community to help manage such cases appropriately, as they are often not reported due to the disease's masking features with other diseases. As the literature suggests, the clinical picture of such exotic infections could be similar to most situations of multiorgan dysfunction, such as severe malaria, dengue, Hantavirus infection, typhoid, rickettsia infections, immunosuppressive, sepsis, and radiation therapy.[10]

CONCLUSION

In our case report, we present a rare instance of leptospirosis that resulted in both multiorgan failure and transverse myelitis. This highlights the importance of recognizing atypical presentations and conducting a thorough examination and workup to avoid misdiagnosis. Further research is necessary to establish a connection between transverse myelitis and leptospirosis.

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