ORIGINAL RESEARCH PAPER

Gastroenterology

"NEUROLEPTOSPIROSIS WITH HEPATORENAL SYNDROME -AN UNUSUAL PRESENTATION "

KEY WORDS:
Neuroleptospirosis, hepatorenal syndrome, pontine stroke

Dr. Nidhin Devadas	Senior Resident, Department Of Medical Gastroenterology, Govt.medical College, Kozhikode.
Dr. Sithara. K. Balagopal	Assistant Professor, Department Of Medical Gastroenterology, Govt.medical College, Kozhikode
Dr. Rajiv Mohan	Senior Resident, Department Of Medical Gastroenterology, Govt.medical College, Kozhikode
Dr. Sunil Kumar Kandiyil	Professor And Head, Department Of Medical Gastroenterology, Govt. medical College, Kozhikode

ABSTRACT

Leptospirosis can very rarely present with neurological manifestations like meningitis, encephalitis, myelopathy, Guillain-Barre syndrome and stroke. Although there are a few hand-picked case reports of hemorrhagic stroke in leptospirosis, presentation with jaundice and pure sensory stroke has not been reported. Here we present such an interesting and extremely rare case of neuroleptospirosis who presented with hepatorenal syndrome and sensory stroke and had evidence of pontine ischemia which responded well to treatment without any sequelae. Prompt diagnosis and treatment with antibiotics are the cornerstones of management.

INTRODUCTION

Leptospirosis is a zoonotic disease caused by Leptospira species and can very rarely present with neurological manifestations like meningitis, encephalitis, myelopathy, Guillain- Barre syndrome and stroke. Although there are a few hand- picked case reports of hemorrhagic stroke in leptospirosis, presentation with jaundice and pure sensory stroke is even rarer. Here we present such an interesting and extremely rare case of neuroleptospirosis who presented with jaundice and had evidence of pontine ischemia which responded well to treatment.

To the best of our knowledge, this is the first of its kind reported in literature. In patients with hepatorenal dysfunction and neurological manifestations, neuroleptospirosis should be considered as a differential diagnosis. Prompt diagnosis and treatment initiation is crucial, as it leaves no sequelae even in the presence of neurological manifestations.

Case Report

A 65 year old male farmer without any comorbidities from northern Kerala presented to Medical gastroenterology OPD with history of fever and jaundice of 1 week duration and sudden onset numbness of right upper limb and lower limb for 3 days. Fever was intermittent and was associated with severe myalgia. Jaundice was progressive without abdominal pain, pruritus or pale stools.

There was no history of headache, vomiting, blurring of vision, weakness of limbs, bleeding manifestations or decreased urine output. On general examination, he was well built with a BMI of 22.7 kg/m^2. He had a deep icterus and temperature of 38°C. His blood pressure was 138/70 mmHg and pulse rate was 92/minute. Calf muscle tenderness was present and there was no conjunctival suffusion.

Examination of the abdomen was normal. Neurological examination showed disorientation to time and place with a MMSE score of 20 out of 30. There was impairment of light touch in the right upper limb and lower limb. Pain and temperature sensations as well as proprioception and vibration senses remained intact.

Power, tone of muscles and cranial nerve examination were normal. There was no neck stiffness. Examination of other systems was normal.

Baseline investigations done on the day of admission showed neutrophilic leukocytosis (TC 19900/mm^3, DC $P_{84}L_{12}E_2M_2$) with thrombocytopenia(25000/mm^3). He had hyponatremia, hypocalcemia and hypomagnesemia. Renal function test was suggestive of prerenal AKI. Liver function test showed a total bilirubin of 25.6 mg/dL (Direct 13.8mg/dL) with AST and ALT of 83 and 63 IU/L respectively. His ALP and INR were normal. Blood sugar and lipid profile done were normal. Urine routine showed albumin of 1+ and 3-5 RBC/HPF. Chest x-ray taken was normal.

Ultrasound abdomen was normal .MRI brain with spine screening was done in view of pure sensory stroke which showed an acute lacunar non hemorrhagic infarct in left hemipons with restricted diffusion and ADC drop (Figure 1).

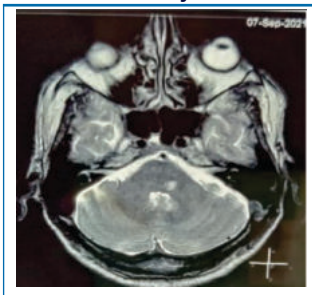
Since he had hepatorenal syndrome with sensory stroke , possibility of leptospirosis, dengue fever and malaria were considered and was evaluated .

Peripheral smear was suggestive of neutrophilic leukocytosis with shift to left, thrombocytopenia and didn't show any hemoparasites. Serology for hepatitis A, B,C,E and dengue viruses were negative. CK MB done was high (1280 IU/ml). IgM Leptospira was positive and showed a rising titre after 5 days confirming the diagnosis of leptospirosis.

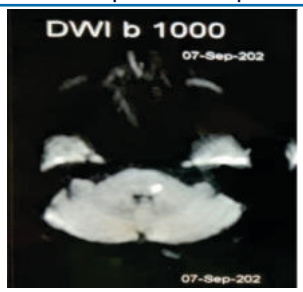
He was treated with Inj. Ceftriaxone 1g IV BD, oral doxycycline 100mg BD and IV fluids. After Neurology consultation, he was initiated on Clopidogrel and Atorvastatin Dyselectrolytemia was corrected with IV 3% saline, Magnesium sulphate, and Calcium carbonate.

His condition slowly improved and fever subsided and there was gradual waning of jaundice. Repeat investigations showed normalization of RFT, serum electrolytes and amelioration of LFT.

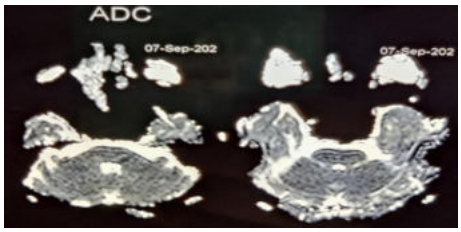
Final diagnosis was Leptospirosis with nonoliguric AKI and right pure sensory stroke due to left pontine infarct. Patient was discharged after 7 days of antibiotics. At the time of discharge, his neurological symptoms showed remarkable improvement.



A



B



C

Figure 1(a)-T1 sequence showing hyperintense acute lacunar infarct in left hemipons,(b)-Lesion shows diffusion restriction in DWI, (c)-Lesion showing ADC drop

DISCUSSION

Leptospirosis can have varied presentations ranging from mild or asymptomatic illness to severe form(Weil's syndrome) with multi system involvement. Incubation period is 1-2 weeks and it has a classical biphasic presentation(1). Acute phase lasts for 3-10 days and is characterized by fever. During the immune phase, patients can have resolution of symptoms or may develop a fulminant illness. Mortality rate is 5-15% without treatment(2).

Liver injury is well described in leptospirosis. Serum bilirubin concentration is as high as 30-40 mg/dL and takes several days to normalize. There is moderate elevation of transaminases usually around 100IU/ml and mild increase in ALP. Jaundice in leptospirosis is predominantly cholestatic and hepatocellular damage is very minimal. There is impairment of ATP dependent secretion of conjugated bilirubin into bile canaliculi.

Acute kidney injury is seen in 16-40% cases and is predominantly non oliguric. Renal injury may be due to direct nephrotoxic action of bacteria, host immune response or indirect effects of infection such as dehydration or rhabdomyolysis. Typical lesion is tubulointerstitial nephritis(3).

The neurological manifestations of leptospirosis are aseptic meningitis, cerebellitis, myelitis, Guillain-Barre syndrome, intracranial bleed, tremors or rigidity which are described as Neuroleptospirosis(6). Aseptic meningitis is the commonest manifestation of neuroleptospirosis as 50-90% of patients have CSF pleocytosis. Symptomatic neurological involvement is rare, seen in less than 15% of patients. There are case reports of hemorrhagic stroke following leptospirosis which is attributable to thrombocytopenia, hypoprothrombinemia or immune mediated vasculitis(7). Progressive narrowing of cerebral arteries with development of collaterals have been described in few patients(8).

Endothelial damage and systemic inflammatory response caused by the disease can lead to atherosclerosis and several studies have shown leptospirosis as a risk factor for CAD and peripheral arterial occlusive disease(9). But these are late manifestations of the condition and ischemic stroke during illness is rarely described. There is one case report of leptospirosis presenting with Anton syndrome and authors concluded that it was because of occipital cerebritis(7).There is a reported case of Neuroleptospirosis presenting as seizures and coma due to basal ganglia involvement(8). Pure sensory stroke has not been reported so far as a complication of leptospirosis, however can occur due to endothelial damage and vasculitis.

This case highlights the extreme uniqueness of this condition with hepatic and renal dysfunction coexisting with neuroleptospirosis.To conclude, In patients with hepatorenal dysfunction and neurological manifestations, neuroleptospirosis should be considered as a differential diagnosis. Prompt diagnosis and treatment initiation is crucial as it leaves no sequelae and delay in diagnosis carries high mortality.

REFERENCES

1. Marr JS, Cathey JT. New hypothesis for cause of epidemic among native Americans, New England, 1616-1619. Emerg Infect Dis. 2010;16(2):281-286.
2. Human leptospirosis-guidance for diagnosis, surveillance and control, WHO 2003 guidelines.
3. Da Silva Junior GB, Srisawat N. Acute kidney injury in leptospirosis: Overview and perspectives. Asian Pac J Trop Med 2018;11:549.
4. Li KY, Chou MC, Wei JC, Lin MC, Hung YM, Chang R. Newly Diagnosed Leptospirosis and Subsequent Hemorrhagic Stroke: A Nationwide Population-Based Cohort Study. Stroke. 2021;52(3):913-921.
5. Chen Y. Zhonghua Shen Jing Jing Shen Ke Za Zhi. Chinese journal of neurology and psychiatry 1990;23(4):226-255.
6. Chiu, Chun-Hsiang et al. "Leptospirosis and Peripheral Artery Occlusive Disease: A Nationwide Cohort Analysis." Medicine vol. 95,11 (2016): e3127.
7. Saeed, Nasheeda et al. "First Reported Case of Neuroleptospirosis Complicated With Anton's Syndrome." Frontiers in neurology vol. 9 966. 4 Dec. 2018.
8. Landais, A. "Neuroleptospirosis and MRI evidence of basal ganglia involvement." Medecine et maladies infectieuses vol. 45,11-12 (2015): 481-3.