doi:10.17659/01.2024.0025

Journal of Case Reports 2024;14(4):94-96

Guillain-Barré Syndrome Linked to Hepatitis E Virus

Rahul Turkar, Sayed Asad Jalil, VM Naik

Department of Internal Medicine, Mumbai Port Authority Hospital, Mumbai, Maharashtra, India.

Corresponding Author:
Dr Rahul Turkar
Email: turkar.rahul235@gmail.com

Received : January 12, 2024
Accepted : July 2, 2024
Published : November 5, 2024

Abstract

Background: Hepatitis E virus (HEV) infection typically presents with hepatic symptoms, it can also lead to a range of extra-hepatic manifestations, including neurological complications. Among these, Guillain-Barré syndrome (GBS) has emerged as an important, though rare, HEV-associated neurological disorder. *Case Report*: We report a case of a 70-year-old man with acute HEV infection who initially presented with general fatigue, anorexia, mild jaundice, and tea-coloured urine. Despite liver-protective treatment, on the fifth day of admission, he developed progressive muscle weakness, numbness, and an inability to walk. Neurological examination confirmed rapidly worsening symmetrical weakness in all limbs, along with facial nerve palsy and absent reflexes in the lower extremities. GBS was suspected, and cerebrospinal fluid (CSF) analysis showed albumin-cytologic dissociation, while nerve conduction studies confirmed sensori-motor radiculo-neuropathy. Serology was positive for IgM and IgG anti-HEV antibodies, and HEV-associated GBS was diagnosed. The patient was treated with intravenous immunoglobulin (IVIG) and methylprednisolone, showing gradual improvement over the next two weeks. *Conclusion*: HEV infection, though primarily hepatic, can present with severe neurological manifestations such as GBS. Early recognition of HEV-associated GBS can prevent complications and improve prognosis.

Keywords: Facial Palsy, Hepatitis, Jaundice, Neurological Disorders, Weakness.

Introduction

Hepatitis E virus (HEV) infection, a leading cause of acute viral hepatitis worldwide, presents a significant public health concern due to its potential for high morbidity. Although HEV commonly causes both acute and chronic hepatitis, most infections remain asymptomatic [3]. Among symptomatic cases, HEV can lead to severe complications such as fulminant acute hepatitis, liver fibrosis, or cirrhosis. Furthermore, various extra-hepatic manifestations, including neurological disorders, have been associated with both acute and chronic HEV infections [1,2].

One of the uncommon extra-hepatic presentations of HEV is neurological complications like Guillain-Barré syndrome (GBS), which affects approximately 5.5% of HEV-infected patients, particularly in developed countries [4]. This article presents a rare case of Guillain-Barré syndrome due to acute HEV infection.

Case Report

A 70-year-old non-immunocompromised man presented with general fatigue, anorexia, mild jaundice, and tea-coloured urine for seven days. He was referred to a local hospital, where his liver function tests showed elevated levels of aspartate aminotransferase (AST) at 260 U/L (normal: 8-48 U/L), alanine aminotransferase (ALT) at 584 U/L (normal: 7-56 U/L), and total bilirubin at 4.7 mg/dL (normal: 0.1-1.2 mg/dL). Serological testing was positive for IgM antibodies against HEV. A working diagnosis of acute hepatitis E was established, and the patient received liver-protective treatment. However, on the fifth day of admission, he reported

progressive muscle weakness in his lower limbs, numbness, and an abnormal pinprick sensation in his plantar surfaces, leaving him unable to walk. Due to the rapidly worsening symmetrical weakness in his lower and upper limbs, he was transferred to the intensive care unit for further treatment.

The patient had a history of diabetes mellitus and hypertension but no exposure to polluted environments, animals, blood transfusions, risky sexual behaviour, or drug addiction. On admission, his general examination was largely unremarkable. His temperature was 36.8°C, and his blood pressure was 120/78 mmHg. Physical examination revealed asthenia, jaundice, and paraesthesia. Cranial nerve examination showed unilateral facial nerve palsy. Romberg's sign and the straight leg raise test were positive. He had motor weakness in all limbs, with power rated as 4/5 in the upper limbs and 2/5 in the lower limbs. Reflexes were normal in the triceps, biceps, and brachioradialis, while the patellar and Achilles tendon reflexes were absent bilaterally.

After two days, he developed dysphagia, choking, areflexia, and laboured breathing. Neurological examination revealed rapidly progressing muscle weakness in all four limbs. His upper extremity strength was graded 2/5 in the proximal muscles and 4/5 in the distal muscles, while both proximal and distal leg muscles had a strength of 1/5. Suspecting Guillain-Barré syndrome (GBS), a lumbar puncture was performed on the second day. Cerebrospinal fluid (CSF) examination showed absence of monocytes (normal: 0-5 U/L), glucose 126 mg/dL (normal: 50-80 mg/dL), and protein 32.7 mg/dL (normal: 15-45 mg/dL), suggesting albuminocytologic dissociation. Nerve conduction studies indicated bilateral lower-limb-predominant sensorimotor radiculo-neuropathy and femoral neuropathy. Further laboratory investigations revealed total bilirubin at 4 mg/dL (normal: 0.1-1.2 mg/dL), conjugated bilirubin at 2.3 mg/dL (normal: 0-0.3 mg/dL), ALT at 128 U/L (normal: 7-56 U/L), and gamma-glutamyl transferase (GGT) at 160 U/L (normal: 9-48 U/L). Serology showed positive results for IgM and IgG anti-HEV antibodies, with no serological evidence for hepatitis A, hepatitis B, hepatitis C, syphilis, or HIV. Tests for anti-ganglioside antibodies GM1 and GM2 were negative, though serum immunoglobulin G levels were elevated. Cerebral computed tomography (CT) and magnetic resonance imaging (MRI) scans were normal.

Based on the patient's clinical history, physical examination, and laboratory findings, a diagnosis of HEV-associated Guillain-Barré syndrome was confirmed. He was treated with intravenous immunoglobulin at a total dose of 2 g/kg body weight over five days [5,6]. Methylprednisolone was also administered to suppress the inflammatory response. Over the next two weeks, the patient's clinical condition and muscle strength improved gradually, with no complaints of respiratory distress or malaise. At discharge, he had 5/5 power in his arms and 4/5 power in his legs. One month later, his liver function had significantly improved, with AST and ALT levels nearing normal. Serology showed a negative result for IgM antibodies, indicating full recovery from the acute phase of hepatitis E. The patient responded well to treatment, with muscle strength fully restored.

Discussion

Hepatitis E virus (HEV), previously known as enterically transmitted viral hepatitis, is hyper-endemic in many developing countries and also present in developed nations. While primarily known for causing hepatitis, HEV-related neurological injuries are an emerging concern due to their potential for significant morbidity. The clinical spectrum of HEV-associated neurological injury is broad, with Guillain-Barré syndrome (GBS) and neuralgic amyotrophy being the most frequently reported conditions. Other neurological complications associated with HEV include transverse myelitis, encephalitis, cranial nerve palsy, and meningoradiculitis [1,2].

GBS is an acute immune-mediated polyradiculoneuropathy characterized by rapidly progressing, symmetric motor paralysis, limb palsy, hyporeflexia, areflexia, and other neurological deficits [5]. It is a heterogeneous disorder with several subtypes, including acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN), acute motor-sensory axonal neuropathy (AMSAN), and Miller Fisher syndrome (MFS) [5]. Typically, GBS is preceded by an infection that triggers an immune response, which, through molecular mimicry, cross-reacts with peripheral nerve components. Patients with GBS may have positive anti-ganglioside antibodies, such as GM1 or GM2, contributing to autoimmune inflammatory polyneuropathy [5].

As GBS becomes increasingly recognized as an extra-hepatic manifestation of HEV infection, it is important to consider HEV in patients who present with neurological symptoms alongside elevated liver enzymes. In this case, HEV infection was confirmed by the presence of IgM anti-HEV antibodies in the serum. HEV infection itself is typically self-limiting and often requires no specific treatment, but intravenous immunoglobulin (IVIG) has proven effective for managing GBS [5,6].

Conclusion

HEV infection, beyond its hepatic manifestations, can present with serious neurological complications such as GBS. Early identification of HEV-associated neurological symptoms is crucial, particularly in patients with elevated liver enzymes and unexplained neurological findings. This case highlights the importance of timely diagnosis and intervention with IVIG in HEV-associated GBS, leading to favorable outcomes.

Contributors: RT: manuscript writing, patient management; SAJ: manuscript editing, patient management; VMN: critical inputs into the manuscript. RT will act as a study guarantor. All authors approved the final version of this manuscript and are responsible for all aspects of this study.
Funding: None; *Competing interests*: None stated.

References

1. Jha AK, Kumar G, Dayal VM, Ranjan A, Suchismita A. Neurological manifestations of hepatitis E virus infection: An overview. World J Gastroenterol. 2021;27(18):2090-2104.
2. Rawla P, Raj JP. Kannemkuzhiyil AJ, Aluru JS, Thandra KC, Gajendran M. A systematic review of the extra-hepatic manifestations of hepatitis E virus infection. Med Sci. 2020;8(1):9.
3. Chauhan A, Webb G, Ferguson J. Clinical presentations of hepatitis E: A clinical review with representative case histories. Clinics and Research in Hepatology and Gastroenterology. 2019;43:649-657.
4. Choudhary MC, Bajpai V, Anand L, Gupta E. Guillain-Barré syndrome in a patient of acute hepatitis E virus infection associated with genotype 1: Case report and literature review. Intractable Rare Dis Res. 2019;8(1):43-47.
5. Meena AK, Khadilkar SV, Murthy JM. Treatment guidelines for Guillain-Barré Syndrome. Ann Indian Acad Neurol. 2011;14(Suppl 1):S73-S81.
6. Rath J, Zulehner G, Schober B, Grisold A, Krenn M, Cetin H, *et al*. Real-world treatment of adult patients with Guillain-Barré syndrome over the last two decades. Sci Rep. 2021;11(1):19170.

