MedCrave
Step into the World of Research

Journal of Neurology & Stroke

Case Report

Open Access

CrossMark

Transverse myelitis associated in young patient with hepatitis e: a rare neurological complication

Abstract

Background: Previously, several cases have been reported on transverse myelitis associated with demyelinating diseases. In this case report, we mention longitudinally extensive transverse myelitis, a rare extra hepatic manifestation of Hepatitis E patient. As per our knowledge, no such case has previously been reported from Pakistan.

Case: A young male patient, initially treated as a case of Hepatitis E, developed bilateral lower limb weakness and urinary retention during his disease course. Neuroimaging showed longitudinally extensive transverse myelitis.

Conclusion: We concluded that further workup in such patients should be extended to rule out demyelinating diseases and long-term management should be planned accordingly.

Keywords: longitudinally extensive transverse myelitis, LETM, hepatitis E, extra hepatic manifestation

Volume 14 Issue 6 - 2024

Dr. Amina Saddiqa,[1] Dr. Usama Hayyan,[2] Dr. Muhammad Annas Farooq,[2] Dr. Haris Majid Rajput,[3] Dr. Zeeshan Munawar,[4] Dr. Mazhar Badshah[5]

[1]Department of Neurology, Pakistan Institute of Medical Sciences, Pakistan
[2]Resident Critical Care Medicine, Pakistan Institute of Medical Sciences, Pakistan
[3]Assistant Professor Neurology, Pakistan Institute of Medical Sciences, Pakistan
[4]Registrar Neurology, Pakistan Institute of Medical Sciences, Pakistan
[5]Professor of Neurology, Pakistan Institute of Medical Sciences, Pakistan

Correspondence: Amina Saddiqa, Department of Neurology, Pakistan Institute of Medical Sciences Islamabad Pakistan, Email aminasaddiqa@gmail.com

Received: December 14, 2024 | **Published:** December 31, 2024

Abbreviations: LETM, longitudinally extensive transverse myelitis; GBS, gulian barre syndrome; LFTs, liver function tests; S.BIL, serum bilirubin; ALT, alanine transaminase; RFT, renal function test; S/E, serum electrolytes; USG, ultrasound; OPD, outpatient department; JVP, jugular venous pulse; I/V, intravenous; CSF, cerebrospinal fluid; MRI, magnetic resonance imaging; CNS, central nervous system; PLEX, plasma exchange; MOG, myelin oligodendroglycocyte protein; NMOSD, Neuro myelitis optica spectrum disorders; PCR, polymerase chain reaction; LETM, longitudinally extensive transverse myelitis

Introduction

Hepatitis E (Hep E) is a viral infection, with a global prevalence of 20 million and 3.3 million being symptomatic.[1] It is normally self-limiting but can be fatal with 5-10% mortality. Although mostly asymptomatic, when symptomatic, Hep E presents with fever, jaundice, vomiting and abdominal pain. Extra hepatic manifestation like acute pancreatitis, renal failure, thrombocytopenia, and neurological involvements causing neurologic amyotrophy, GBS, encephalitis and transverse myelitis have been reported as well.[2] Transverse myelitis is an immune mediated neurological disorder presenting with the spectrum of motor, sensory and autonomic abnormalities. Etiology of acute transverse myelitis include infectious, para infectious, collagen vascular disorder and paraneoplastic syndromes. Transverse myelitis can affect all ages but has bimodal peak between ages of 10-19 and 30-39 years with an annual incidence of 1 to 8 new cases per 1 million per year.[3,4] In this case report, we present a case of a patient with Hepatitis E who later developed transverse myelitis during the disease course.

Case presentation

A 28 years old male resident of Islamabad, businessman by profession, married for 2 years having one child, with no previous known co morbid, presented in Emergency Department of your hospital with a 5 days history of fever, vomiting, jaundice, and abdominal pain. Relevant examination showed the patient as deeply jaundiced. Spleen was palpable on abdominal exam. The rest of the examination was unremarkable. Patient's baseline investigations showed leukocytosis of 14000, liver function tests (LFTs) were grossly deranged with serum bilirubin of 2.47 and Alanine transaminase (ALT) of 2778. Renal function tests (RFTs), coagulation profile and serum electrolytes were within normal limit. Serology for hepatitis A, B, C were negative but IgM positive for Hep E. USG abdomen showed splenomegaly with gastritis-like changes. The patient was given symptomatic treatment and was discharged home on oral medications with advice to repeat LFTs and follow up in Gastroenterology OPD. 5 days later, the patient again presented in emergency department with complaint of bilateral lower limbs weakness, which was gradual in onset, progressive, symmetrical, involving distal muscles earlier than proximal muscles; he was unable to bear weight or stand without support. Facial, bulbar, and respiratory muscles were spared. Paraplegia was associated with urinary retention which was not associated with spinal trauma, back, rectal, or perineal pain. There was no previous or preceding history of hesitancy, dysuria, pyuria, hematuria, weight loss, nor any history of any medications that may cause urinary retention. On examination, a young male patient was lying comfortably on bed having I/V cannula and catheter in place, appearing mildly jaundiced. There was no cyanosis, clubbing. JVP not visualized. No enlargement of thyroid gland, lymph nodes or edema noted.

Glasgow coma scale (GCS) was E4M6V5 15/15, well-oriented in time and space, pupils were bilaterally equal round and reactive to light, plantars were extensors bilaterally. On sensory exam, sensory level was found at the level of T10. Motor examination showed normal bulk and tone, power was 5/5 (MRC grade 5) in upper limbs and 1/5 (MRC grade 1) in lower limbs and deep tendon reflexes were 3+ in all limbs. No cerebellar signs in upper limbs but could not be assessed in lower limbs due to decrease in motor power. Rest of the exam was unremarkable (Table 1 & 2) (Figure 1).

Table 1 Baseline investigations

Date	4/5/2023	2/5/2023	30/04/23	29/04/23	28/04/23	26/04/23
ALT- SGPT		386	396	315	464	1049
Alkaline	135	132	162	124	159	211
Phosphatase (ALP) Bilirubin Total(S)	2.33	2.96	4.02	4.27	6.56	13.6
Albumin - S		3.63			4.24	
Creatinine - S	0.69	0.851		0.831	1.21	1.11
Urea – S	34.5	29.3		12.1	16.3	17.7
WBC (Haema)	12150				13680	11540
Hemoglobin (HB)	14.9				14.5	16
Platelet Count	351000				315000	387000
Poly (Neutrophils)	81%				77%	70%
Prothrombin Time (PT)	13.61				18.85	15.27
INR	1.05				1.49	1.05
APTT	26.99				34.36	42.48

CSF studies showed

Table 2 CSF Routine examination

Volume	1.0 ml
Colour	Colourless
Appearance	Clear
Coagulum	Not Present
Xanthochromia	Not Present
WBCs	17 Cells/uL
Neutrophils	80%
Lymphocytes	20 %
Glucose	70.70 mg/dl
Protein	22.4 mg/dl

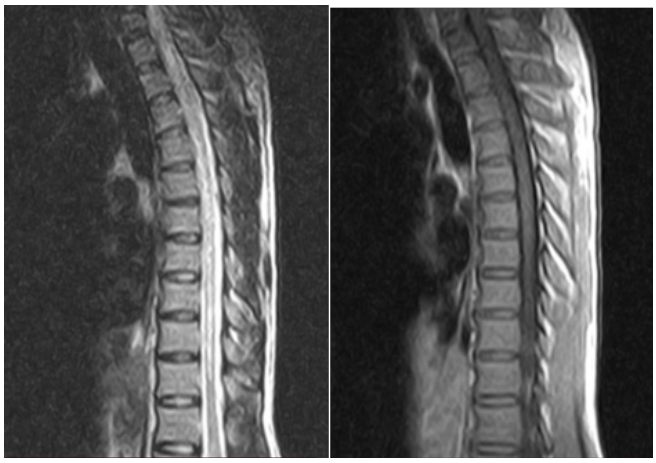

Figure 1 MRI Dorso lumbar spine with contrast (A) T2 SAGGITAL view (B) T1 SAGGITAL view

Suspicion of transverse myelitis was made; lumbar puncture was done and CSF was analyzed for routine examination and oligoclonal bands. The result showed pleocytosis, predominantly neutrophils but with normal protein and glucose. Oligoclonal bands were positive. MRI cervicodorsal spine with contrast was also done; the sagittal view showed subtle area of hyperintense signal at distal thoracic cord, more conspicuous T3 to T7. Taken the results of CSF studies and MRI cervicodorsal spine, all features strongly suggested longitudinally extensive transverse myelitis. The patient was then started on pulse dose steroids; Inj. Methylprednisolone for 5 days. Patient's power of lower limbs gradually improved to 4/5 on MRC scale and was later discharged to home.

Discussion

Hepatitis E is a viral infection, caused by Hepatitis E virus of Hepeviridae family, having 4 major genotypes and single serotype. Mostly transmitted by feco-oral route through contaminated water. In Pakistan, this disease affects about 22-26% adults, mainly manifesting in pregnant females as severe acute liver failure in 3rd trimester, leading to maternal mortality of around 20-29.3% and perinatal mortality of 30.3 per 1000 live birth.[5,6] Usually, it presents with fever, jaundice, vomiting and abdominal pain. Diagnosis is made by identification of Hepatitis E IgG, IgM and HEV RNA in blood.[5] Along with hepatic manifestation, Hep E has multiple extrahepatic manifestation such as acute pancreatitis, glomerulonephritis, hemolytic anemia with G6PD, thrombocytopenia, peripheral and central nervous involvement causing Guillain-Barre syndrome (GBS), neurologic amyotrophy and meningoencephalitis, encephalitis, pseudotumor cerebri and transverse myelitis respectively.[2,7] In our case, the patient acutely developed fever, jaundice, vomiting and abdominal pain and was diagnosed as a case of hepatitis E on serology. He was treated symptomatically and improved but during the disease course, he developed paraplegia and urinary retention along with sensory deficit below the level of T10. Our literature search showed that previously 3 cases of transverse myelitis associated with Hep E were reported. In first case, a 12 years old Indian girl developed bilateral lower limb weakness on 20th day of developing HEV infection.[8,9] MRI showed cervical spine swelling. She recovered spontaneously in 2 days without any treatment in contrast

Citation: Saddiqa A, Hayyan U, Farooq MA, et al. Transverse myelitis associated in young patient with hepatitis e: a rare neurological complication. *J Neurol Stroke.* 2024;14(6):198–200. DOI: 10.15406/jnsk.2024.14.00608

to our patient who was given pulse dose of Methylprednisolone. Another case of 62 years old Caucasian female was reported who developed paraplegia with sensory level of T-8 associated with HEV.[9] MRI showed no signs of spinal cord inflammation. She was given 2 doses of Methylprednisolone and no response to treatment was noted. In comparison to that, our patient recovered and was discharged home after 5 doses of Methylprednisolone. Another case of 42 years old male showed severe inflammation of CNS with multiple disseminated lesions on central and spinal level.[10] Patient initially presented with musculoskeletal weakness along with bowel and bladder hypoesthesia up to level T8. During the disease course, the patient developed paraplegia with sensory level progressing up to T5 and complete visual loss which was regained after some time. Successive MRI showed worsening of demyelination. The patient was given multi modal therapy of Ribavirin 1.0 g along with 2 sessions of plasma exchange (PLEX) of 0.35g/Kg/day for 10 days; the patient was referred to rehabilitation as there was no improvement of power. In contrast to this, our patient had no central involvement or visual loss. Ribavirin was not given, but only symptomatic treatment for Hep E was given. Patient's paraplegia improved with pulse dose steroids and without PLEX sessions. No causal relationship has been identified so far between Hep E and transverse myelitis and pathogenesis remains under speculations; proposed possible mechanisms include direct microbial invasion or autoimmune process likely due to molecular mimicry or superantigen-mediated disease as previously described in para-infectious Transverse myelitis.[11,12] Currently, no specific therapy is being given for Hep E except symptomatic treatment in immune competent patients; although pegylated interferons and ribavirin is used in immunocompromised individuals, but only 1 study indicated a notable decrease in viremia with ribavirin. Considering autoimmunity as a possible cause of transverse myelitis, we chose to treat our patient with Inj. Methylprednisolone 0.35mg/Kg/Day for 5 days. In conclusion, we recommend that all patients with deranged LFTs and bilateral lower limbs weakness must be screened for Hepatitis E.

The following limitations were found in the case report: HEV serology and PCR RNA were not done in CSF and serum, which could lead to neurotropic variant of HEV. Genotype was not identified, as the previous reports showed genotype 3 was found to be associated with HEV associated with Transverse myelitis. No proper guidelines exist currently regarding using anti- viral agents in patients with HEV-induced transverse myelitis. Further workup needs to be done to exclude causes of demyelinating diseases and a plan for long term immunotherapy should be done.

Conclusion

A thorough workup is warranted in such patients for demyelinating disease like myelin-oligodendrocyte-glycoprotein (MOG) antibody disease and neuromyelitis optica spectrum disorder (NSMOD), as previously studies reported presence of Anti MOG antibody in post infectious cases of transverse myelitis.

Declaration

Ethical approval: It has been approved by the Departmental Review Board and Ethics Committee, Neurology Department of Pakistan Institute Of Medical Sciences.

Consent to participate and publication: Consent to participate and publication has been taken by the participant. **Competing interest /conflict of interest**: The authors declare that they have no competing interests.

Funding: No funding sources.

Author's contributions: All authors participated in data collection and manuscript writing. All authors read and approved the manuscript

Acknowledgments: I am grateful to my co-authors who contributed to this study.

Informed consent: Consent for participation and publication has been taken from patient prior to study.

References

1. Rein DB, Stevens GA, Theaker J, et al. The global burden of hepatitis E virus genotypes 1 and 2 in 2005. *Hepatology*. 2012;55(4):988–9897.
2. Fousekis FS, Mitselos IV, Christodoulou DK. Extrahepatic manifestations of hepatitis E virus: An overview. *Clin Mol Hepatol.* 2020;26(1):16–23.
3. Altrocchi PH. Acute transverse myelopathy. *Arch Neurol [Internet*]. 1963;9(2):111–119.
4. Berman M, Feldman S, Alter M, et al. Acute transverse myelitis: incidence and etiologic considerations. *Neurology [Internet].* 1981;31(8):966–971.
5. Aggarwal R. Diagnosis of hepatitis E [Internet]. *Nature Reviews Gastroenterology & Hepatology*. 2013;10:24–33.
6. Kar P, Sengupta A. A guide to the management of hepatitis E infection during pregnancy. *Expert Rev Gastroenterol Hepatol*. 2019;13(3):205–211.
7. Butt AS, Sharif F. Viral hepatitis in Pakistan: Past, present, and future. *Euroasian J Hepatogastroenterol.* 2016;6(1):70–81.
8. Mandal K, Chopra N. Acute transverse myelitis following hepatitis E virus infection. Indian Pediatr. 2006;43(4):365–366.
9. Sarkar P, Morgan C, Ijaz S. Transverse myelitis caused by hepatitis E: Previously undescribed in adults. *BMJ Case Rep.* 2015:bcr2014209031.
10. Rahmig J, Grey A, Berning M, et al. Disseminated inflammation of the central nervous system associated with acute hepatitis E: A case report. *BMC Neurol.* 2020;20(1):391.
11. Brocke S, Hausmann S, Steinman L, et al. Microbial peptides and superantigens in the pathogenesis of autoimmune diseases of the central nervous system. *Semin Immunol.* 1998;10(1):57–67.
12. Kaplin AI, Krishnan C, Deshpande DM, et al. Diagnosis and management of acute myelopathies. *Neurologist.* 2005;11(1):2–18.