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Case Report

Parsonage-Turner Syndrome Due to Acute Hepatitis E Infection

Areeb Khan[1*], Hameed Ur Rehman[1], Habib Ur Rehman[1]

[1] Core Medical Trainee 2, Nottingham University hospitals, England

Abstract

We Report a case of a 59-year-old male, with no past medical history and foreign travel, who presented with a 1-week history of left arm weakness and numbness followed by an inability to contract his Left biceps for a duration of 48 hours. These symptoms occurred after eating Pork Ribs at a local restaurant 2 weeks ago. On presentation, he was jaundiced, and his liver function tests demonstrated a hepatitis-like picture. He had a positive Hepatitis E PCR result. His diagnosis was brachial neuritis secondary to acute Hepatitis E infection. Viral Hepatitis E infection has been reported in 10% of patients with brachial neuritis. According to the most recent case report article published in April 2017 in the journal of NeuroVirology, only 9 such cases have been reported in the UK. We therefore possibly report the 10th case of Hepatitis E associated brachial neuritis in the UK in a non-immunocompromised patient without any past medical history. This case again reminds us to consider Hepatitis E infection in a patient presenting with neurological signs and Deranged Liver function tests.

Case Summary

We Report a case of a 59-year-old male, with no past medical history and foreign travel, who presented with a 1-week history of left arm weakness and numbness followed by an inability to contract his Left biceps for a duration of 48 hours. These symptoms occurred after eating Pork Ribs at a local restaurant 2 weeks ago. He also had 5 episodes of watery diarrhea in the past week but no reported blood in the stools. He denied any abdominal and chest pain. He did not have any symptoms of nausea and vomiting.

He did not have any relevant past medical history and he denied any history of alcohol and smoking. He also denied any history of recent foreign travel.

He had no family history of metabolic or inherited liver conditions. He was not on any regular medications and he worked as a cashier in a grocery store.

On clinical examination, the patient was profoundly jaundiced, however his vital signs were stable. His cardiovascular, respiratory and abdominal examinations were unremarkable. Weakness was noted in his left infraspinatus and deltoid muscles. Weakness and wasting were also noted in his left biceps and triceps muscles. The patient's main complaint was pain in his left biceps muscle specifically in the morning, and intermittent numbness in his left forearm, however no objective sensory abnormalities were detected.

All his blood tests including full blood count, urea and electrolytes, and coagulation profile were normal apart from his liver function tests. They were the following; **Bilirubin 176µmol/L, ALP 275 g/l, ALT 2803 g/l, GGT 393 U/l**.

His calcium levels were normal. His vital signs were normal, and his chest x-ray was unremarkable. His ECG was sinus rhythm.

He had an infectious liver screening done and the results were the following;

- Hepatitis E PCR: Positive
- Hepatitis E RNA: Detected
- Hepatitis E IgG: Detected
- Hepatitis E IgM: Detected
- Hepatitis A,C,B: NEGATIVE
- HIV: NEGATIVE
- EBV, CMV: NEGATIVE

He had an electromyography test performed (EMG). The dominant finding of this study was of significant axonotmesis affecting the left musculocutaneous nerve, including its lateral antebrachial cutaneous branch.

There were neurogenic abnormalities affecting the left triceps, 1st dorsal interosseous and infraspinatus muscles. These abnormalities were mild and there was no evidence of active denervation. This test was performed six weeks post-injury. The patient did report an improvement in his symptoms. Figure 1.

Discussion

Hepatitis E is a non-enveloped single-stranded RNA virus. Its main mode of transmission is via the faecal-oral route. The hepatitis E strains infecting humans are divided into 4 distinct genotypes. From the 4 genotypes, Hepatitis E virus (HEV) genotype 3 is the most common in developed countries. The main source of genotype 3 infections is from pigs due to the consumption of inadequately cooked pork meat. In a study in France in 2009, HEV seroprevalence in French pig farms was 65%. An increasing number of incidences of central or peripheral neurological symptoms associated with genotype 3 hepatitis E have been described, especially Guillain-Barre

Corresponding author: Areeb Khan, Core Medical Trainee 2, Nottingham University hospitals, England, Tel: 004407405230682; E-mail: areebkhan11@hotmail.com

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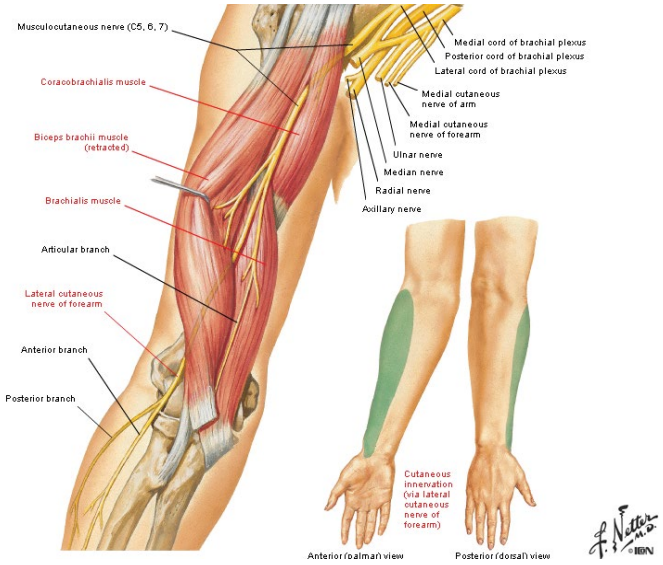

Figure 1: The anterior view of the musculocutaneous nerve [1].

syndrome. A recent study found anti-HEV IgM antibodies in 5% of patients with Guillain-Barre syndrome [2]. Figure 2.

In immunocompetent patients, the clinical course of acute hepatitis E is self-limiting and hence it can sometimes even remain undiagnosed. While most contact with HEV Genotype 3 induces clinically silent seroconversion, some patients develop symptomatic acute hepatitis. Patients with underlying chronic liver disease, are at risk of hepatic decompensation. Moreover, in immunosuppressed patients, HEV infection can evolve into chronic hepatitis, and subsequently to the development of liver cirrhosis. In immunodeficient cases therefore, there may be an indication for ribavirin administration [2].

There are various extra-hepatic manifestations of Hepatitis E, a good summary is illustrated in the image below. Figure 3.

Despite the emerging evidence of HEV causing extra-hepatic manifestations, a causal link between these diseases and HEV remains to be proven. However current data strongly indicate a causal relationship between HEV infection and specific neurological syndromes, namely Guillain-Barre syndrome and Neuralgic Amyotrophy. The same holds true for Glomerulonephritis with or without cryoglobulinemia. In these conditions HEV PCR and HEV serology is recommended [3].

What is Neuralgic Amyotrophy?

Neuralgic Amyotrophy (NA) is a multiple mononeuropathy predominantly affecting the nerve roots and the brachial plexus

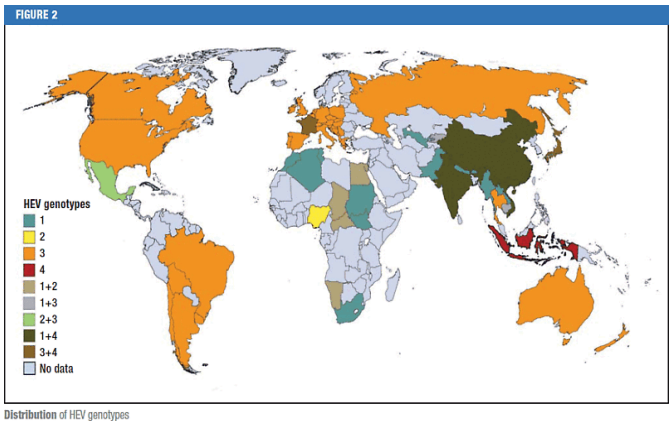

Figure 2: Geographical Distribution of HEV genotypes [2].

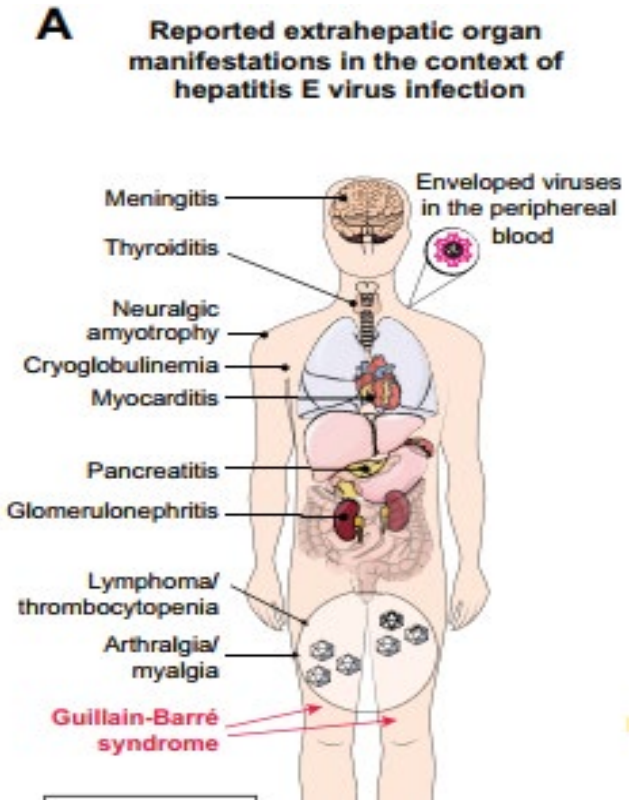

Figure 3: Extra-hepatic Manifestations of Hepatitis E [3].

causing amyotrophy. It presents as an Acute and severe neuropathic pain followed by multifocal paresis and possible sensory symptoms. NA is characterized by severe axonal damage. The most commonly affected muscles (In descending order of frequency) are: Infraspinatus, serratus anterior, supraspinatus, biceps, rhomboid and pronator teres. Sensory complaints are present in 66-78% of patients. The prognosis is normally quite good. Recovery is demonstrated after a period of 6 months to 3 years in 80% of cases. A short course of corticosteroids for 2 weeks can shorten the painful phase and provide more frequent recovery after 1 year. However, the mainstay of treatment is primarily aimed at symptomatic relief [4,5].

Hev-Associated Neuralgic Amyotrophy

37 cases describing HEV-associated NA have been reported. 76% of them were bilateral. The mean and median age of the patients was 46 and 50 years (range 28–65). 80% of them were male. The ALT levels of patients ranged widely from 27–2457 IU/L (mean 884 IU/L, median 1007 U/L) In all 37 cases, all HEV RNA positive patients displayed Genotype 3.

Ribavarin and steroids have been used in some patients with extra-hepatic manifestations with apparent success. The efficacy of these drugs however still needs to be verified by larger studies [6,7]. Figure 4.

Conclusion

Hepatitis E has various extra-hepatic manifestations. Neurological and renal diseases are very likely to be causally related to HEV infection.

Hepatologists should be aware of the possibility of acute or chronically HEV infected patients to develop extrahepatic manifestations. According to the most recent case report article published in April 2017 in the journal of NeuroVirology, only 9 such cases of HEV- associated neuralgic amyotrophyhave been reported in the UK. We therefore possibly report the 10th case of Hepatitis E

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Table 3. Neurological manifestations associated with HEV infection.

Neurological disorder	No. of cases	References
Peripheral nervous system diseases:		
Guillain-Barré syndrome	n = 41	[33,34,37–39,44,74,104,112–124]
Miller Fisher syndrome	n = 2	[41]
Neuralgic amyothrophy	n = 37	[34,40–43,49,125–137]
Polyradiculoneuropathy	n = 2	[47]
Bell's Palsy	n = 3	[138–140]
Mononeuritis multiplex	n = 6	[41]
Vestibular neuritis	n = 1	[42]
Oculomotor palsy	n = 1	[141]
Small fiber neuropathy	n = 1	[42]
Neuromyopathy	n = 1	[42]
Paresthesia	n = 1	[142]
Central nervous system diseases:		
Meningoencephalitis	n = 9	[34,48,143,144,43,45–47,122]
Transverse myelitis	n = 1	[145]
Meningoradiculitis	n = 2	[41]
Pseudotumor cerebri	n = 1	[146]
Pyramidal syndrome	n = 1	[49]

Figure 4: Neurological manifestations of Hepatitis E. Number of reported cases; this is taken from the Journal of Hepatology 2017 [3].

associated brachial neuritis in the UK in a non-immunocompromised patient without any past medical history [8].

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