

Dorsal root ganglionopathy in a hepatitis C patient: a case report

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ABSTRACT

We report an unusual clinical presentation of dorsal root ganglionopathy in a hepatitis C patient with negative cryoglobulins characterized by both motor and sensory symptoms. This mixed clinical picture in a hepatitis C patient is rare but should be considered a potential complication of HCV infection.

Key words. Sensory neuropathy. Viraemia.

INTRODUCTION

The prevalence of sensory neuropathy in hepatitis C patients using nerve conduction studies in previous studies has been reported as 28%.¹ Yoon, *et al.* using pain related evoked potential found that the prevalence of sensory neuropathy was much higher than previous studies at 43.5%.² The etiology of peripheral nerve damage in hepatitis C patients is unclear.

We would like to report an unusual clinical presentation of dorsal root ganglionopathy in a hepatitis C patient with negative cryoglobulins characterized by both motor and sensory symptoms.

CLINICAL PRESENTATION

LD a 39-year-old lady presented to the Medical Assessment Unit of our hospital complaining of fatigue and general malaise for two months. She had undergone upper GI endoscopy (including duodenal biopsy) and colonoscopy four days prior, for investigation of iron deficiency anaemia. Both procedures were uneventful and no abnormalities were noted. Coeliac serology (including tissue trans glutaminase) was negative. Her iron-deficiency was felt to relate to excess menstrual blood loss, and

she had been commenced on enteral iron supplementation.

At the time of her presentation she also complained of weakness in both lower limbs, which had resulted in a number of falls. She described intermittent numbness and tingling in both her feet and hands.

Her background history was notable for chronic hepatitis C infection, diagnosed 9 years prior. This was secondary to a history of intravenous drug use, from which she had been abstinent for 12 years.

Prior to the development of these symptoms she had been independent of all daily activities and had never suffered from any neurological illness.

On examination she had mild reduction in power of her left lower limb associated with impaired proprioception. She was also noted to be Romberg's positive and had an ataxic gait. The rest of her examination was unremarkable.

Her laboratory investigations confirmed the previously documented iron deficiency anaemia (haemoglobin 8.1 g/dL, MCV 77) and mildly deranged liver function tests consistent with her known chronic hepatitis C infection.

She was subsequently admitted for further investigations. Four days into her admission her symptoms progressed whereby she became unable to walk or stand. Her upper limbs remained unaffected. She proceeded to have a number of investigations including MRI, and lumbar puncture both of which were normal. Nerve conduction studies and electromyography demonstrated an absence of sensory nerve action potentials in the lower limbs, consistent with a dorsal root ganglionopathy with second-

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dary motor axonal loss due to deafferentation. There was no evidence of peripheral motor demyelination. Given the positive findings from her EMG, a nerve biopsy was not considered necessary. An extensive viral, metabolic and immune profile was performed. Anti-GM1 antibodies were noted to be positive. Cryoglobulins were negative, and HCV PCR confirmed active chronic hepatitis C (genotype 1, VL 1,760,319 IU/mL).

She was treated empirically with high dose intravenous methylprednisolone (1 g daily for 3 days) followed by a slowly tapering course of oral steroids. She also received a 5 day course of intravenous immunoglobulin (Flebogamma 0.4 g/kg). Over the course of the next 4 weeks her symptoms improved to the point where she could mobilize with the assistance of a zimmer frame. She was subsequently discharged home with ongoing outpatient rehabilitation.

DISCUSSION

Peripheral neuropathy is a common complication of HCV infection and may be due to several etiologies including neurotoxicity of the virus itself,³ cryoglobulinaemia⁴ and treatment (i.e. interferon) induced.⁵ In cryoglobulin positive HCV patients, cryoglobulin is thought to cause small vessel vasculitis, which affects the perivascular region of the peripheral nerve.⁶ Contrary to this, some reports of nerve biopsies in cryoglobulin positive HCV patients has demonstrated epineural vasculitis.⁷ Detectable cryoglobulins are present in about 50 percent of HCV patients although most of them do not have cryoglobulin related symptoms.⁷ The peripheral neuropathy seen in HCV is almost universally sensory in nature.

Dorsal root ganglion cells that lie in the intraforaminal spaces of the vertebral column are affected in dorsal root ganglionopathy.⁸ The neurons in the dorsal root are afferent and so a sensory neuropathy is the usual presenting complaint. The most common differential diagnosis for sensory ganglionopathies include inherited conditions like Friedreich's ataxia, spinocerebellar ataxia with neuropathy, mitochondrial neuropathies, inherited disorders of fat absorption; and acquired conditions like demyelinating neuropathies (Guillain-Barre syndrome, Miller-Fisher syndrome), chronic ataxic neuropathy, or chronic immune sensory polyradiculopathy.⁸ The clinical features of sensory ganglionopathy consist of pain, paresthesia, numbness, cramps, fatigue, abnormal hot and cold sensation and nocturnal pain in upper limbs and/or

lower limbs. Patients will often describe irritation of legs and/or feet by bed linen and will usually have early gait and limb ataxia with severe loss of joint position and vibration sense.⁸ Motor involvement is uncommon.

Dorsal root ganglionopathy is usually only seen in patients with HCV treated with interferon therapy.^{4,5} Our patient had never received treatment for her HCV. Conversely, treatment of the virus with Pegylated interferon and Ribavirin may have offered a potential avenue for amelioration of her neuropathy, although data on this point is conflicting and has often been associated with worsening of symptoms.^{4,9} In any event, our patient declined anti-viral therapy because of a prior history of significant clinical depression and concern over the occurrence of adverse events with interferon therapy.

GM1 is present in abundance in the neuronal membrane in the dorsal nerve roots and myelin and hence it is associated with axonal degeneration and lack of sensory alteration. Our patient was noted to be anti-GM1 positive suggesting that the motor involvement observed was a secondary phenomenon due to deafferentation. However, the specificity of anti-GM1 antibodies appears to be low as it is present in normal controls, connective tissue diseases and paraneoplastic conditions.^{10,11}

Our patient presented with progressive weakness in both lower limbs suggesting predominately motor involvement with other signs (and symptoms) of dorsal root involvement including loss of joint position and vibration sense, intermittent numbness with pins and needles in both hands and feet. This mixed clinical picture of both motor and sensory involvement in a hepatitis C patient with dorsal root ganglionopathy and negative cryoglobulins is rare but should be considered a potential complication of HCV infection.

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