

# Acute Myelitis after Hepatitis B Vaccination

We report a case of myelitis after plasma-derived hepatitis B vaccination. The patient was a 31-year-old man who presented with progressive sensory symptoms in extremities that developed 2 weeks after a third vaccination. MRI of the cervicothoracic region revealed swelling and T2 high signal at the level of C4 to C5 cord, and isolated enhancement in the posterior columns between C4 and C5 cord. The significance of MRI findings and HLA haplotype of the patient will be briefly discussed. (*JKMS 1997; 12:249~51*)

Key Words : Hepatitis B, Vaccination, Myelitis, HLA typing

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Received : January 27, 1997

Accepted : March 22, 1997

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## INTRODUCTION

Although very unusual, acute neurological complications may occur after vaccination against hepatitis B. They include convulsions, Bell's palsy, Guillain-Barre syndrome, lumbar radiculopathy, optic neuritis, transverse myelitis and leukoencephalitis (1, 2). We present a case of isolated myelitis developed 2 weeks after hepatitis B vaccination.

## CASE REPORT

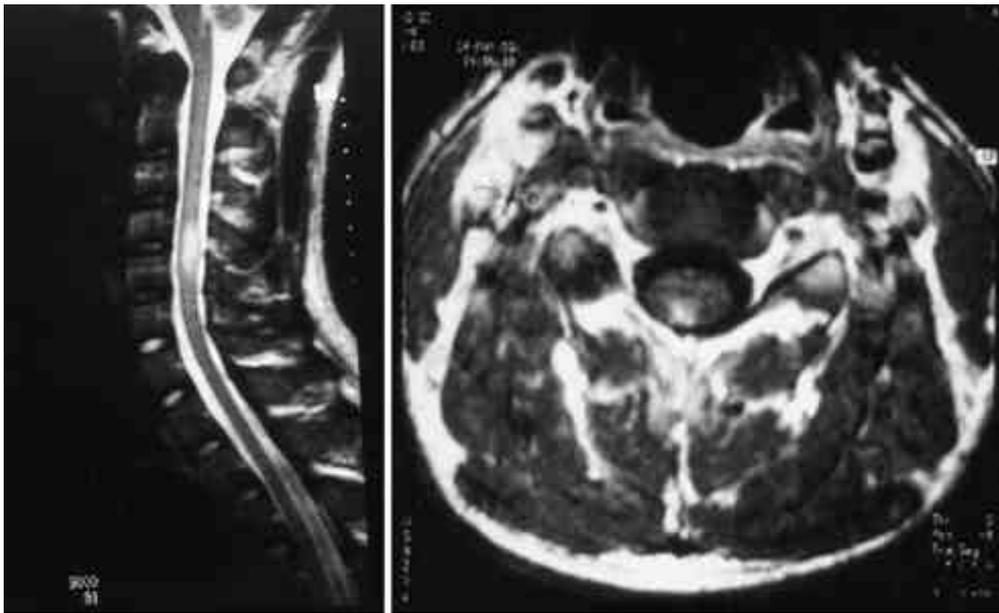
A 31-year-old man presented with a 3-week history of progressive tingling sensation in both extremities that developed from the left lower, left upper, right lower and right upper extremity in order. The symptoms began about two weeks after a third injection of plasma-derived hepatitis B vaccine. He denied symptoms suggesting recent upper respiratory infection or gastroenteritis. Physical examination was unremarkable except for mildly impaired proprioception in all extremities and positive Lhermitte sign on neck flexion. Hepatitis B serology was positive for HBs antibodies (388.3 mIU/ml). MRI of the cervicothoracic region, performed 3 weeks after symptom-onset, revealed swelling and T2 high signal at the level of C4 to C5 cord, and isolated enhancement in the posterior columns between C4 and C5 cord (Fig. 1). Serological test for syphilis, HIV antibody, LE cell and antinuclear antibody were all negative. Cerebrospinal fluid (CSF) examination for cell counts and total protein were normal and smear or culture for tuberculosis, bacteria and fungus were all negative. CSF virus isolation study for enteroviruses, herpes viruses and rubella virus

was also negative. There was no evidence of intrathecal immunoglobulin synthesis or oligoclonal bands. Myelin basic protein was within normal limit. Blood HLA typing for DR2 and DQ locus were negative. Brain MRI excluding the possibility of silent encephalitis was normal. He had progressively improved and did not show Lhermitte sign after intravenous methylprednisolone (1 g/day) for 3 days. On follow-up MRI of the cervical region done 12 weeks later, previous cord edema and T2 high signal were markedly decreased and prior enhancement was no longer seen (Fig. 2). There was no relapse during a 6-month follow-up with left side paresthesia as a residual deficit.

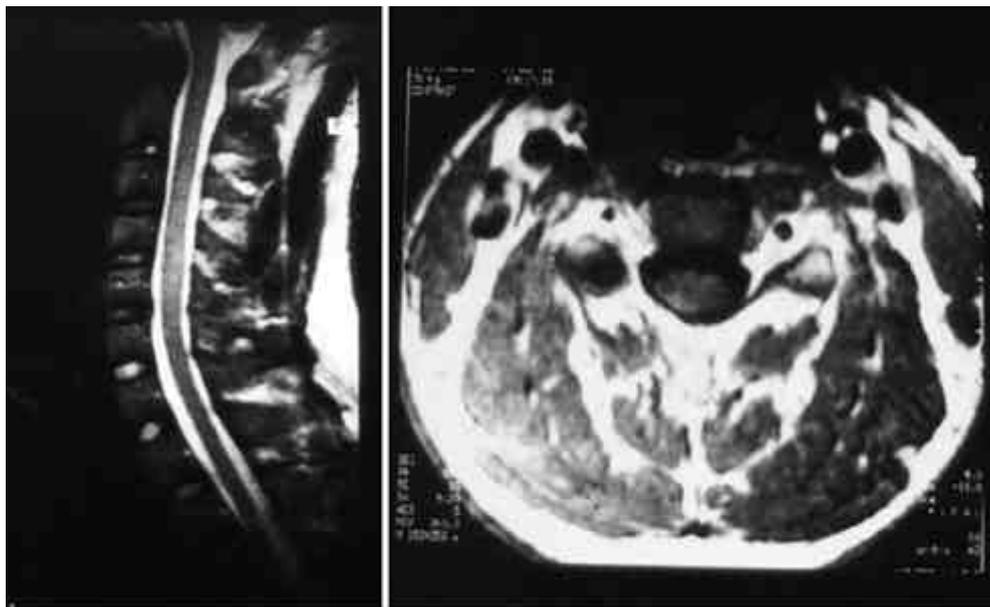
## DISCUSSION

In this case, though pathologic proof was not possible, the temporal relationship between symptoms and the third dose of hepatitis B vaccine strongly suggests that the vaccine was the cause. Besides, there was no prodromal events or laboratory results that clearly suggests postinfectious myelitis and other forms of demyelinating disease such as multiple sclerosis. Also, resolution of swelling on the follow-up MR study essentially rule out the diagnosis of a low-grade glioma.

Postvaccinal myelitis is an rare inflammatory disorder of the spinal cord. The pathogenesis is unclear, but the possible mechanism involves an autoimmune phenomenon associated with T-cell mediated immune reaction (3, 4). Myelitis secondary to vaccinations has rarely been reported, including rabies (5), small pox (6), influenza (7), rubella (8), plasma-derived form of hepatitis B (2), and a recombinant form of hepatitis B (9).



**Fig. 1.** MRI of cervical region. Left : T2-weighted sagittal image shows hyperintense signal at the level of C-4 to C-5. Right : T1-weighted axial contrast-enhanced image demonstrates that the posterior enhancement appears isolated to the posterior columns, especially in the right side.



**Fig. 2.** Follow-up MRI of cervical region. Left : On T2-weighted coronal image, previous edema is subsided and cervical hyperintensity is not remarkable (TR 3000ms, TE 91ms). Right : Contrast enhanced T1-weighted axial image shows no enhancing region (TR 750ms, TE 15ms).

The clinical course and MRI findings of our case are similar to those of Tartaglino et al. (9), in that main clinical feature was progressive sensory change and isolated enhancement in the posterior columns was shown on MRI, which corresponded to his predominant

and persistent deficit. A larger series would be required to determine whether enhancement characteristics are predictive of residual deficit and whether posterior column enhancement is a characteristic of postvaccination myelitis as they suggested.

On the other hand, Herroelen et al.(1) and Kaplanski et al.(10) suggested that vaccination against hepatitis B could potentially induce central nervous system complications in patients with the HLA B7 and DR2 haplotype which are associated with multiple sclerosis. However, our patient did not have HLA DR2, and DQ6 haplotype which is more consistently associated with multiple sclerosis than HLA B7 (11). Further case studies will be necessary to support the positive correlation between HLA haplotype and CNS complications after vaccination, if any.

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