Intravenous Immunoglobulin Treatment Successfully Improved Subacute Progressive Polyradiculoneuropathy with Polyclonal Gammopathy

Kaoru Endo, Naoki Suzuki, Taro Ikenishi, Masashi Aoki and Yasuto Itoyama

Abstract

The present case was an elderly man with a history of gastric cancer, diffuse biliary duct stenosis and liver cirrhosis. He had markedly elevated IgG, suggesting chronic infection or inflammatory changes in the biliary duct. He developed weakness in his arms and became unable to use his hands within one month and 2 weeks later, he had difficulty walking. Based on his progressive disease course, elevated serum IgG, nerve conduction study and enhanced MRI findings, we diagnosed him as suffering from immune-mediated subacute polyradiculoneuropathy with polyclonal gammopathy, which might be related to Guillain-Barré syndrome. Intravenous immunoglobulin (IVIg) was dramatically effective in this patient. In the follow-up 6 months later he was stable and could walk without a cane. Even in patients with polyclonal gammopathy in chronic inflammatory disease of another organ, IVIg may be effective and beneficial for the patients’s quality of life.

Key words: intravenous immunoglobulin (IVIg), polyclonal gammopathy, Guillain-Barré-syndrome

Introduction

Although intravenous immunoglobulin (IVIg) is considered to be a first-line treatment for autoimmune neuropathy, such as Guillain-Barré syndrome (GBS), chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), and multifocal motor neuropathy (MMN) (1), there is still a reluctance to use IVIg in cases of atypical neuropathy. IgM monoclonal gammopathy has been reported to be involved in various peripheral neuropathies (2), there are few reports about peripheral neuropathy with polyclonal gammopathy (3). Here, we report a liver cirrhosis patient with polyclonal gammopathy with subacute progressive polyradiculoneuropathy for which IVIg was dramatically effective.

Case Report

A 70-year-old man had a history of total gastrectomy for gastric cancer three years previously. An elevation of liver enzymes was revealed during a regular office visit. Endoscopic retrograde cholangiography showed diffuse biliary duct stenosis, and pus was drained from the papilla of Vater. Although antibiotics and ursodeoxycholic acid were used, his liver function soon worsened. The patient developed weakness in his arms in August 2007. The progression was subacute and he became unable to use his hands within one month. In mid-September, he also felt difficulty in walking and then he visited our department. Clinical examination showed jaundice caused by liver malfunction. Neither edema nor exanthema was observed. On the Medical Research Council Scale, his muscle strength was grade 0 for the upper limbs and grade 3 for the lower limbs. Deep tendon reflexes were abolished. Lasègue’s test was bilaterally positive. He did not have sensory disturbance, autonomic dysfunction, pathological reflex or cranial nerve involvement. Laboratory data showed decreased albumin (1.5 g/dL) and increased levels of serum IgG (4.4 g/L), which was approximately 2.0 g/L in March 2007. Total cholesterol was low (86 mg/dL). There was no M-peak in the protein fraction and no M-protein in the immunoelectrophoresis, although immune-fixation electrophoresis was not ex-
Table 1. Nerve Conduction Study of This Patient on the Left Side

<table>
<thead>
<tr>
<th></th>
<th>median</th>
<th>ulnar</th>
<th>tibial</th>
<th>peroneal</th>
<th>sural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal latency</td>
<td>5.05 ms</td>
<td>3.85 ms</td>
<td>4.4 ms</td>
<td>7.4 ms</td>
<td>6.75 ms</td>
</tr>
<tr>
<td>CMAP proximal</td>
<td>7.17 mV</td>
<td>4.21 mV</td>
<td>2.62 mV</td>
<td>356 µV</td>
<td>-</td>
</tr>
<tr>
<td>CMAP distal</td>
<td>7.97 mV</td>
<td>4.60 mV</td>
<td>6.06 mV</td>
<td>922 µV</td>
<td>-</td>
</tr>
<tr>
<td>MCV</td>
<td>44.3 m/s</td>
<td>51.9 m/s</td>
<td>33.7 m/s</td>
<td>36.8 m/s</td>
<td>-</td>
</tr>
<tr>
<td>F-wave persistency</td>
<td>6%</td>
<td>62%</td>
<td>56%</td>
<td>12%</td>
<td>-</td>
</tr>
<tr>
<td>SCV</td>
<td>35.4 m/s</td>
<td>35.1 m/s</td>
<td>-</td>
<td>-</td>
<td>35.6 m/s</td>
</tr>
<tr>
<td>SNAP</td>
<td>22.33 µV</td>
<td>3.314 µV</td>
<td>-</td>
<td>-</td>
<td>1.938 µV</td>
</tr>
<tr>
<td>Temporal dispersion</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Conduction block between the stimulus sites</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

The abnormal portion is represented in bold font. CMAP: complexed motor action potential, MCV: motor nerve conduction velocity, SCV: sensory nerve conduction velocity, SNAP: sensory nerve action potential.

The present patient had a history of gastric cancer, diffuse biliary duct stenosis and liver cirrhosis. He had markedly elevated IgG suggesting chronic infection or inflammatory changes in the biliary duct. Based on the progressive disease course, NCS and enhanced MRI findings, we diagnosed him as autoimmune mediated polyradiculoneuropathy with polyclonal gagmopathy, possibly a Guillain-Barré syndrome-like disorder (4). As terminal latency was prolonged in more than 2 peripheral nerves, the patient’s condition fulfilled the criteria of CIDP, though the disease duration was subacute. IVIg was dramatically effective in this patient, although laboratory findings concerned with liver dysfunction or infection were not changed. On the other hand, improved physical findings and NCS after IVIg treatment suggested his symptoms were immune mediated with the background of liver cirrhosis.

Little has been reported about peripheral neuropathy caused by or combined with polyclonal gammopathy (5, 6). Furthermore, the predominantly motor neuropathy of the present case is very rare and there has been no information about appropriate treatment for such a case. Though the relationship between hypergammaglobulinemia and polyradiculoneuropathy has not been proven, the serum IgG was elevated at the onset of muscle weakness in our case, suggesting the involvement of elevated IgG in the pathogenesis of the muscle weakness. It is of interest that IVIg had such a remarkable effect on this patient who had polyclonal gammopathy and suffered from sclerosing cholangitis. IVIg may have multiple effects on the immune and inflammatory process (1). Although the abnormal production of autoimmune IgG may be suppressed by IVIg treatment, the mechanism of the beneficial effect of IVIg remains to be elucidated. We must consider the risk of hyperosmolarity when using IVIg for elderly patients. In conclusion, even in patients with polyclonal gammpathomy in chronic inflammatory disease of another organ, IVIg may be effective and beneficial for the patient’s quality of life.

amined. In the cerebrospinal fluid, the cell count was 0/µL and protein was 34 mg/dL. The IgG index was 0.53. The patient was diagnosed as polyclonal IgG gammopathy. Bilirubinemia, anemia and thrombocytopenia due to liver cirrhosis were also demonstrated. The spinal fluid study did not show albuminocytologic dissociation. Cryoglobulin, ANCA, ACE, anti-ganglioside antibody and anti-Hu antibody were all negative. Nerve conduction study (NCS) revealed decreased F-waves and elongation of terminal latency in median, peroneal and sural nerves (Table 1), suggesting the involvement of both the peripheral nerve and radix. Conduction blocks between the stimulus sites and temporal dispersion were observed in tibial and peroneal nerves suggesting a demyelinated status. A-wave was not observed. Lymphadenopathies that were pointed out previously in the CT scan had not changed for years and tumor markers were also negative. Bone marrow study and positron emission tomography study were also negative. No tumor nor abdominal fluid was seen. MRI showed a mild enhancement in the cervical nerve root. No malignancy was found in a bone marrow study and positron emission tomography study.

His general muscle weakness continued to progress even after admission and he was eventually confined to a bed. We diagnosed him as autoimmune mediated polyradiculoneuropathy with polyclonal gammopathy, possibly representing a Guillain-Barré syndrome-like disorder. IVIg (0.4 g/kg BW for five days) was administered and was dramatically effective. He became able to stand up by himself and walk around with assistance three days after IVIg therapy was started. After the third IVIg therapy, he could eat by himself and walk around without care. The occurrences of F-wave in the tibial nerve and SCV/SNAP in the median, ulnar, sural nerves were improved in NCS. He was discharged from our hospital in December 2007. Serum IgG was 4.5 g/L at discharge, and no adverse effect concerning hyperosmolarity was observed after IVIg treatment. In the follow-up 6 months later he was stable and could walk without a cane.
Acknowledgement
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References


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