A Patient with Acute-Onset HAM/TSP after Blood Transfusion Complicated with Pseudopseudohypoparathyroidism

Key words: HTLV-I, short stature, Gsa, PTH

Human T-lymphotropic virus type I (HTLV-I)-associated myelopathy/tropical spastic paraparesis (HAM/TSP) is caused by HTLV-I. HTLV-I may also cause various conditions such as bronchopulmonary disturbance, arthritis, polymyositis, and uveitis.

Among these patients with HAM/TSP, short stature is often recognized and these short stature patients have common characteristics of slight mental retardation and early onset of the disease under 15 years of age. Among them, three patients were diagnosed as having pseudohypoparathyroidism type Ia (PHP Ia) by parathyroid hormone (PTH) loading test (1). In addition, twelve patients were found to have PHP Ia or pseudopseudohypoparathyroidism (PPHP) among fourteen patients with short stature in an examination of the α subunit of stimulatory guanine nucleotide-binding protein (Gsa) level by Western blot analysis of the erythrocyte membrane and Northern blot analysis of lymphocyte messenger RNA (mRNA) (2).

Furthermore, we found a patient with HAM/TSP, a 66-year-old woman, 141.7 cm tall (1.22×standard deviation shorter compared to the current Japanese average height), and weighed 42 kg. She was diagnosed with mitral insufficiency and underwent surgery for valve substitution at the age of 55; at that time she received a large volume of transfused blood. Nine months postoperatively she started to experience a tightly constricting sensation and dysesthesia in the thoraco-abdomino-lumbar region, hypesthesia in both legs, urinary disturbances, and paraplegia. These symptoms and signs rapidly developed within a three-week period. Her Wechsler adult intelligence scale was 89. Deep tendon reflexes were exaggerated in the lower extremities with positive Babinski sign and ankle clonus bilaterally. Magnetic resonance imaging did not show any lesion in the thoracic spinal cord. Serum calcium, phosphorus, plasma hypersensitive PTH levels, and HTLV-I titer were 8.4 mg/dl (normal, 8.2–10.5), 3.7 mg/dl (2.5–4.5), 370 pg/ml (160–520), and 8,024 fold (cut off level, less than 16 fold, particle agglutination method, Fujirevio, Tokyo), respectively. PTH loading test and lumbar tap did not show any abnormality. HTLV-I titer of cerebrospinal fluid was 128 fold (cut off level, less than 2 fold). The patient had nine siblings, and the three breast-fed siblings closest in age were seronegative to HTLV-I. There was no familial history of HAM/TSP or HTLV-I related diseases in either her or her husband’s family. The patient was diagnosed with HAM/TSP due to infection during blood transfusion. We investigated the protein and mRNA levels of Gsa in the eryth-

![Figure 1. A, Immunoblot analysis of erythrocyte membrane Gso protein. Gso immunoreactivity was decreased in the patient (lane 3). Lane 1, a patient with pseudohypoparathyroidism and 2, 4, the other patients with short stature HAM/TSP; lanes 5, 6, and 7, healthy controls. B, Northern blot analysis of lymphocyte Gso mRNA. Gso mRNA expression level was decreased in the patient compared with that of α-actin levels (lane 5). Lanes 1, 9, rat spleen; 2, 3, healthy controls; 4, patients with adult-onset HAM/TSP; 6, 7, 8, patients with HAM/TSP complicated by short stature. Lane 6 shows a normal level but lanes 7, 8 show decreased levels.](image-url)
rocyte membrane and lymphocytes to confirm whether she had PPHP.

The fluffy layer of erythrocyte membrane was prepared and Western blotting was carried out with anti-Gsα antibody (K-20 antibody, Santa Cruz Biotechnology Inc., CA, USA). The antigenicity to Gsα showing a molecular weight of approximately 45 K daltons, was decreased in the patient (Fig. 1A).

The patient lymphocytes were separated with Ficoll-Hypaque solution (Mono-Poly Resolving Medium, Dainippon Pharmaceutical Co., Osaka), and Northern blotting of total RNA 5 μg was done. The Gsα mRNA level in the patient was decreased, compared to that of other healthy individuals and patients with adult onset HAM/TSP (Fig. 1B).

In a nation-wide survey of the HAM/TSP in Japan in 1988, 30 patients developed symptoms within a year after blood transfusion among 134 patients infected by blood transfusion (3). In twelve of these 30 patients, 6 showed acute or subacute onset in which paraplegia progressed within a one-month period while the other 6 demonstrated insidious onset. However, we have only found 4 patients to date, who showed symptoms within a year after blood transfusion among 53 patients in Kagoshima district; excluding the present patient, the other three showed insidious onset after gastric cancer operation.

The results indicated that this patient had had PPHP (4, 5). In patients receiving blood transfusion, preexisting PHP Ia or PPHP is a risk for contracting HAM/TSP rather than HTLV-I causing PHP Ia or PPHP, as described previously (1, 2), although the quantity of infecting virus in the blood transfusion, the reason for surgery, and the postoperative condition were also factors.

Yoshihiro Yoshida, Naoko Machigashira*, Sha-yan Wang* and Mitsuhiro Osame*

School of Medical Sciences and *the Third Department of Internal Medicine, Faculty of Medicine, Kagoshima University, Kagoshima
Received for publication January 30, 2002; Accepted for publication June 11, 2002
Reprint requests should be addressed to Dr. Yoshihiro Yoshida, School of Medical Sciences, Faculty of Medicine, Kagoshima University, 8-35-1 Sakuragaoka, Kagoshima 890-8506

References