Polyradiculoneuropathy in Boy with Pituitary Dwarfism Treated with Recombinant Growth Hormone

TAKASHI SAKURAI, SOICHI KODAMA, RIE URATA, AND MIKIO KOMATSU

Department of Pediatrics, Himeji Red Cross Hospital, Himeji 670, Japan

UNTIL 1994, 2,589 adverse events (AE) related to GH therapy were reported by Wilton [1] in 1,324 out of 11,858 patients (11%) included in the main Kabi international growth study (KIGS) database. In the report, the most common AE in central and peripheral nervous system disorders was headache, with 103 reports in 74 patients. The next most common AE was convulsions with 58 reports in 43 patients, but no patient with peripheral nervous disorder was reported. Malozowski et al. [2] recognized benign intracranial hypertension in 23 cases treated with GH for 7 years and suggested that high doses and increased frequency of administration contributed to the development of intracranial hypertension [3]. In spite of increased doses and frequency of GH treatment, peripheral neuropathy has not been reported. In the present study, polyradiculoneuropathy in a 12-year-old Japanese boy with pituitary dwarfism treated with GH for 3 years is reported.

Case Report

A 9.5-year-old Japanese prepuberal boy visited Himeji Red Cross Hosp. for examination for short stature (~2.5 SD). The ratio of bone age to chronological age was 70%. The plasma GH responses to three different pharmacological stimuli (insulin, glucagon and GH releasing factor (GRF)) and nocturnal GH secretion in the evening at the interval of every 20 min for 3 h after sleep were inadequate. Plasma LH and FSH responses to LHRH were within normal ranges. Plasma insulin like growth factor I (IGF-I) levels were between 75 and 85 ng/ml. The magnetic resonance imager (MRI) of the pituitary gland and stalk showed in normal size and site. The result of chromosomal examination indicated the 46 XY, normal karyotype of man. These results suggested isolated GH deficiency. The dose of hGH given to him was 0.5 U/Kg/week and the number of injection was 4 times per week. The height of the patient at the start of treatment was 119.3 cm at 9 years and 6 months old, and the final height was 141.5 cm at 13 years old when he complained of gait difficulty on August 2nd, 1995. On August 17th, he was admitted with muscle weakness especially in the legs and hands, difficulty in swallowing and inability to walk that increased over 10 days, but no complications such as respiratory distress, constipation or urinary incontinence were recognized. No preceding infection such as an upper respiratory tract infection or gastroenterocolitis was observed before the muscle weakness. On August 17, he was admitted to pediatrics. There was weakness and wasting of muscles of hands and legs. The knee reflexes and Achilles reflexes were lost, and biceps and triceps reflexes were weak. Serum levels of antibodies to influenza, coxsackie, polio virus and mycoplasma did not increase. The spinal fluid was tested twice. The cell counts were 3 per mm³, on August 17 and August 23. Total protein content was 27 mg/dl and 22 mg/dl, respectively. The oligoclonal IgG band was not recognized on 17th or 23rd. Motor nerve conduction velocity in the median, ulnar and Tibial nerves was within the normal ranges. Electromyography was normal in the proximal and distal muscles. As shown in the figure, from August 23th to 27th, 310 mg/kg of
γ-globulin was given intravenously due to the aggravation of neurological symptoms, but he was able to stand independently on September 2nd and then to walk on Sep. 7th.

Discussion

In almost all polyradiculoneuropathy cases, there had been previous infection, but no previous infection or titer of antibodies to several virus were not recognized in this patient. Since the neurological symptoms progressed gradually, electrophysiological studies were not able to clarify the presence of demyelination. These results suggest that polyradiculoneuropathy in this patient was correlated with recombinant human GH (r-hGH). In our department, higher doses and increased frequency of administration of r-hGH gave rise to the benign intracranial hypertension in a 13-year-old boy treated with r-hGH, but the authors were not able to find any record of a patient with polyradiculoneuropathy as our patient in the literature covering several years.

Fig. 1. Clinical course of the patient. For 5 days, 310 mg/kg of γ-globulin was given, and he was able to stand on 5th day and walk on 10th day after treatment of γ-globulin.

References