

Hypoperfusion of right hemisphere on brain SPECT in a patient with exanthem subitum and left hemiparesis

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Left hemiparesis exhibited during the post-eruptive stage of exanthem subitum (ES) in an 11-month-old girl. Tc-99m HMPAO brain SPECT showed diffuse hypoperfusion in right hemisphere. Hemiparesis has occasionally been reported as central nervous system (CNS) complications of ES, and Tc-99m HMPAO brain SPECT was useful for evaluating of CNS involvement.

Key words: exanthem subitum, central nervous system, Tc-99m HMPAO, SPECT, human herpes virus-6

INTRODUCTION

EXANTHEM SUBITUM (ES) is an acute common disease of infants characterized by high fever and the appearance of a rubelliform eruption following defervescence. The most common complication is convulsions during the initial high fever, and epilepsy, hemiplegia and mental retardation have occasionally been reported.¹⁻⁷

We report a rare case of hemiparesis in the post-eruptive stage of ES and discuss the usefulness of Tc-99m HMPAO brain SPECT.

CASE REPORT

An 11-month-old girl was admitted to our hospital because of high fever (40°C) and generalized tonic convulsions. She had had a high fever for two days. She was delivered at 40 weeks gestation, with a birth weight of 3,245 g, and her neonatal course was uneventful.

On admission, the cerebrospinal fluid (CSF) showed the normal concentrations of protein and sugar, with no pleocytosis. The white blood cell count was 4,300 with 54% lymphocytes. The EEG (Fig. 1) and CT showed no definite abnormal findings. She was treated with diaz-

epam. On Day 5 of the illness, the fever subsided and the characteristic maculopapule appeared, and focal convulsions of the left arm for less than one minute occurred four times. On Day 6, a left hemiconvulsion persisting for three minutes occurred. She was treated with phenytoin. The second EEG showed no definite abnormal findings. MRI showed diffuse mild swelling of the right hemisphere, but showed no abnormal signal intensity area (Fig. 2 left). On Day 8, the patient showed signs of left hemiparesis. Brain SPECT was performed on Day 10 with 185 MBq Tc-99m HMPAO and a dual-headed gamma camera (Toshiba GCA-7200A). Each detector was set to rotate continuously through 180 degrees in 5 minutes with an acquisition time of 20 minutes. SPECT showed diffuse hypoperfusion in the right hemisphere (Fig. 3). These findings were thought to be associated with the cause of the left hemiparesis. The hemiparesis improved gradually. The clinical course is briefly shown in Figure 4.

It was found later that human herpesvirus-6 (HHV-6) was found to be positive in the serum and CSF by polymerase chain reaction. One month later, follow-up MRI showed diffuse mild atrophy of the right hemisphere (Fig. 2 right), and SPECT still showed diffuse hypoperfusion in the right hemisphere (no remarkable interval change).

DISCUSSION

This case report describes Tc-99m HMPAO brain SPECT

Received February 14, 2000, revision accepted March 27, 2000.

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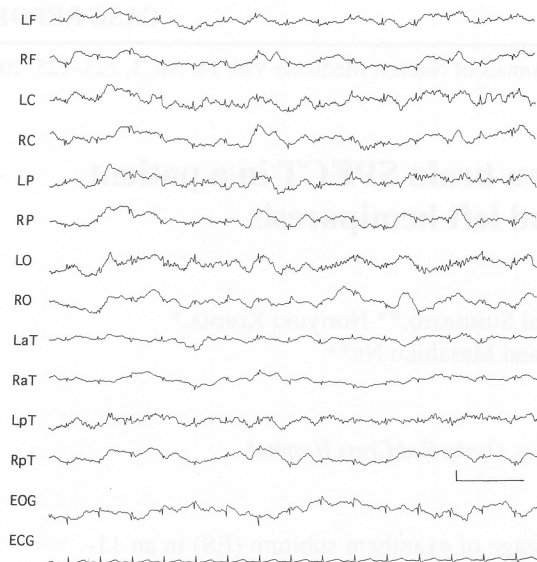


Fig. 1 The EEG showed no definite abnormal findings.

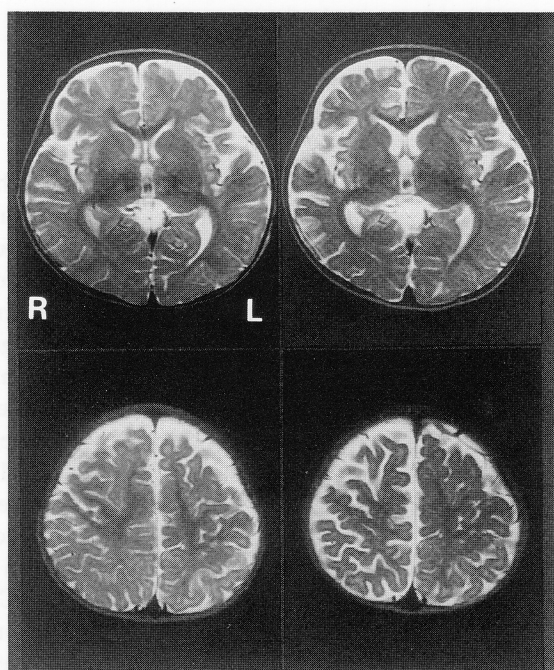


Fig. 2 The first MRI showed diffuse mild swelling of right hemisphere (left), and follow-up MRI showed diffuse mild atrophy of right hemisphere (right). T2-weighted images are shown.

images in a case of hemiparesis associated with ES, and is presented for two reasons. First, the central nervous system (CNS) complications of this case were rare. Second, Tc-99m HMPAO brain SPECT provided good clinical information in the evaluation of the hemiparesis.

It is well known that CNS complications occur during the course of ES. The most common complication is convulsions during the initial high fever, and other CNS

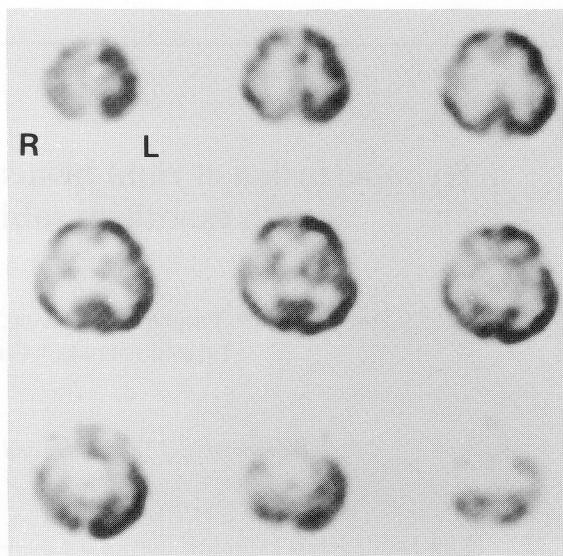


Fig. 3 Tc-99m HMPAO brain SPECT showed diffuse hypoperfusion in right hemisphere.

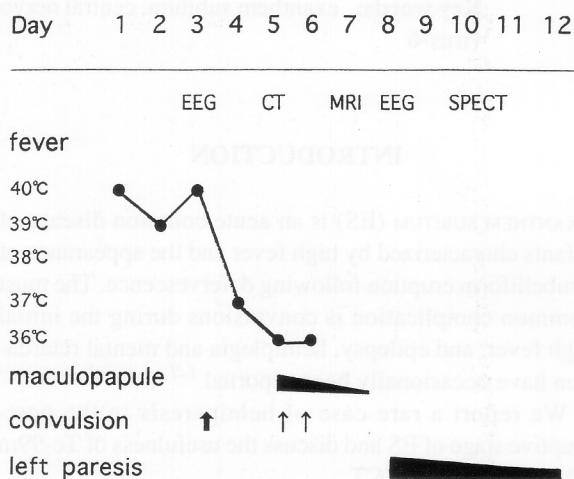


Fig. 4 The clinical course of the patient.

complications such as epilepsy, hemiplegia and mental retardation have occasionally been reported.¹⁻⁷ In the present case, the clinical course in which convulsions and hemiparesis occurred after the defervescence is rare.

There are very few reports of brain SPECT used in the evaluation of CNS complications of ES. Ojima et al. have reported a case with convulsions in the post-eruptive stage of ES which showed diffuse perfusion decrease in the hemisphere, and abnormal EEG and MRI findings.^{5,6} In the present case, Tc-99m HMPAO brain SPECT showed diffuse hypoperfusion, although the EEG was normal.

The usual cause of ES is the recently discovered HHV-6.⁸ The mechanism of CNS complications of ES has been considered as follows, (1) The CNS is directly invaded by the virus; (2) the CNS is damaged secondarily by cerebral vasculitis caused by the virus.^{5,7} In the present case, since

HHV-6 was positive in the CSF, the former mechanism was considered.

In conclusion, we report a rare case of hemiparesis in the post-eruptive stage of ES and showed the usefulness of Tc-99m HMPAO brain perfusion SPECT for evaluating CNS involvement.

ACKNOWLEDGMENTS

We gratefully acknowledge the help of Dr. Kyoko Taya with the HHV-6 examination, and also thank Mr. Takashi Nishikawaji and Mr. Junsuke Uejima for their valuable assistance.

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