Herpes Simplex Encephalitis Presents as large Temporal Lobe Hemorrhage

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Abstract — Herpes simplex virus is the most common cause of sporadic fatal encephalitis. Despite the predilection of the virus for the temporal lobes, it rarely causes large intracerebral hemorrhage. We describe a case of herpes viral encephalitis (HES) with a large temporal lobe hematoma as initial presentation. A 64 year old woman presented with sudden onset of headache and leg pain without fever and behavior change. Initial CT and MRI studies showed a large hematoma in the right temporal lobe. Cerebral angiogram revealed no vascular anomaly. Five days later, she developed seizure activity, hyponatremia, fever and mental status change. EEG studies showed periodic lateralized epileptiform discharges (PLEDs) at the right temporal region. She remained comatose despite aggressive treatment for seizures and hyponatremia. Repeat MRI revealed diffuse FLAIR and DWI signals in bilateral temporal and frontal lobes, suggestive of HES. Polymerase Chain Reaction (PCR) of cerebral spinal fluid DNA demonstrated herpes viral encephalitis (HES). Cerebral spinal fluid DNA showed a large right temporal lobe hemorrhage (Fig 2). The patient was transferred to our center for further evaluation and higher level of care 5 days after symptom onset. She developed generalized tonic-clonic seizures on arrival and was found to have hyponatremia with a sodium level of 123 mmol/L. An urgent cerebral angiography showed no evidence of aneurysm, AVM or dural AV fistula. EEG studies showed periodic lateralized epileptiform discharges (PLEDs) in the right temporal region.

Despite aggressive treatment for seizures and hyponatremia, the patient became unresponsive and febrile with hypotension. Repeat MRI study showed FLAIR and DWI signals in bilateral temporal and frontal lobes (Fig 2, A-D), suggestive of HSE. She underwent lumbar puncture for CSF studies and brain biopsy. Acyclovir was started at that time.

Symptoms of headache, fever, seizure and mental status change often evolve over several days. The mortality rate in untreated patients is as high as 70%. Early diagnosis and treatment with acyclovir may reduce mortality rate to 19%.1,2 Therefore, early appropriate treatment is essential for survival and recovery. HSV was reported to cause large intracerebral hemorrhage (ICH) in infant and young kids.3-5 Frank hematoma on initial CT scan is extremely uncommon in adult HES patient.6

II. CASE REPORT

The patient was a 64 year old woman with past medical history of migraines, hyperlipidemia, hypothyroidism and chronic nausea of unknown etiology. She presented to outside hospital with severe headache and leg pain. She had no history of trauma, fever or mental status change. CT head showed a large right temporal lobe hemorrhage (Fig 1, A and B). MRI with and without contrast demonstrated no evidence of arteriovenous malformation (AVM), mass, or encephalitis (Fig 1, C and D). The patient was transferred to our center for further evaluation and higher level of care 5 days after symptom onset. She developed generalized tonic-clonic seizures on arrival and was found to have hyponatremia with a sodium level of 123 mmol/L. An urgent cerebral angiography showed no evidence of aneurysm, AVM or dural AV fistula. EEG studies showed periodic lateralized epileptiform discharges (PLEDs) in the right temporal region.

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Subsequently, PCR and brain biopsy both confirmed the diagnosis of HSE. Despite maximal medical management, she developed elevated intracranial pressure and required decompressive hemicraniectomy. On hospital day 20, the patient remained in deep coma without any improvement. The family decided to withdraw life support. As a result, the patient expired on hospital day 25.

III. DISCUSSION

Patients with HSE usually present with headache, confusion, fever and seizures. Failure to diagnose this serious disease early may result in permanent disability or death.

Our patient initially presented with primary ICH. The major differential diagnoses included hypertensive bleeding, cerebral sinus thrombosis and vascular anomaly. She had no fever, psychiatric symptoms or seizure in the first few days to suggest an infectious process. When she developed seizure and hyponatremia a few days later, the symptoms were thought to be secondary to ICH and cerebral edema. Only the findings on the second MRI study led to suspicion of HSE. Although aggressive evaluation and empirical therapy with Acyclovir

Fig. 1. A large right temporal lobe hemorrhage was shown on CT head (A and B) and MRI images (C and D).

Fig. 2. Repeat MRI of brain shows hyperintensities in bilateral temporal and frontal lobes on FLAIR (A and B) and DWI (C and D), suggestive of HSE.
were initiated at that time, it appeared to be too late to change outcome.

ICH has been reported to occur as a late complication of HSE in adults. The first documentation of the occurrence of a large intracerebral hematoma in a patient with histopathologically proven HSE was from India per post mortem study. In another case report of PCR proven HSE, Politei et al. showed occurrence of a left parieto-occipital hematoma and new hemorrhagic foci in bifrontal and right temporal lobes in a repeat MRI study while initial scan showed only left parieto-occipital cerebritis. Rodríguez-Sainz et al. reported intracranial hematoma as a late complication of temporal lobe encephalitis in 2 patients. They reviewed the characteristics of 20 additional cases reported in the literature and found out that hemorrhage was present on admission in 35% of pooled patients, and consistently involved the area of encephalitis. Of note, most patients presented with some symptoms of HSE. Our case was unique because the patient presented with a large temporal lobe hemorrhage without symptoms of encephalitis.

The mechanism of large hemorrhage in HSE was unclear. Hypercoagulable state was indicated as the etiology in infants with HSE. Inflammation in the area of a histologically confirmed arteriovenous angioma was implicated in the hemorrhage in a young adult.

HSE may rarely present with primary ICH. In the absence of hypertension, cerebral sinus thrombosis and vascular anomaly, HES may be an additional differential diagnosis for patient with temporal lobe hemorrhage.

References


Educational questions

1. The cause of the most fatal sporadic encephalitis is:
   A. Herpes simplex virus type 1
   B. West Nile virus
   C. Herpes complex virus type 1
   D. Herpes zoster

2. The most common symptom complex of herpes simplex encephalitis are:
   A. Receptive aphasia with left temporal lobe hemorrhage
   B. Headache with right temporal lobe hemorrhage
   C. Global aphasia with hemiplegia
   D. Fever, headache, psychiatric symptoms and seizures
3. The golden standard for the diagnosis of HSE is:

A. Classical clinical presentations
B. Clinical symptoms and imaging evidence of temporal hemorrhage
C. Clinical symptoms and EEG evidence of PLEDs
D. PCR of CSF viral DNA or brain biopsy

4. The effective treatment of Herpes Simplex encephalitis is:

A. Valganciclovir
B. Acyclovir
C. Gancyclovir
D. Amantadine

Answers

1) A; 2) D; 3) D; 4) B.