

Case Reports

Herpes Simplex Encephalitis: Successful Treatment with Acyclovir

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Abstract

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Introduction: One of the most common causes of encephalitis is due to viral infections, such as herpes simplex. Traditionally, brain biopsy was required for the diagnosis of HSV encephalitis; however, here CSF PCR detection for herpes simplex encephalitis is reported which was successfully treated with Acyclovir.

Case presentation: A 52 year old female patient was brought to emergency department with fever (40°C), constipation, abdominal pain, fatigue, disorientation and agitation for the last two days. DNA extraction and Real Time PCR was performed on CSF sample for HSV-1/2 and HSV-1 was positive. Moreover, the brain MRI report showed left and basal temporal oppression, together with left and basal frontal pus. The patient was discharged after 20 days of hospitalization and treatment with acyclovir and normal physiological indexes and had a good clinical and neurologic outcome with resolution of all the symptoms.

Conclusion: It is worthy to emphasize that despite the normal biochemical CSF, imaging results and PCR are proved evidence of HSV encephalitis.

Key Words: Herpes Simplex Virus, Encephalitis, Acyclovir

1. Introduction

Encephalitis is a diffused inflammation of the brain which has a high mortality rate which can have acute or sub-acute forms[1]. One of the most common causes of encephalitis is due to viral infections, such as herpes simplex which is commonly characterized by the acute onset of fever, headache, seizures, focal neurologic signs, and impaired consciousness; therefore, making fast and accurate diagnosis is difficult but is of critical importance[2, 3].

Historically, brain biopsy was required for the diagnosis of HSV encephalitis[4, 5]; nonetheless, this study reports the cerebrospinal fluid (CSF) Real Time PCR detection for herpes simplex encephalitis which was successfully treated with Acyclovir. This study was performed in September 2017 at a teaching hospital in Karaj and this case study has an

ethical permission from the Alborz University of Medical Sciences with reference number 3234234.

1.2 Case presentation

A 52 year old female patient was brought to emergency department with fever (40°C), constipation, abdominal pain, fatigue, disorientation and agitation for the last two days. The patient had a history of diabetes and hypertension that was under medical treatment and according to the initial assessment of nursing, blood glucose and blood pressure was in the normal range.

Firstly, in the emergency ward, Lumbar Puncture (LP) was performed; then, consultation with various specialists such as infectious diseases and heart specialists, and neurologist was initially done and then

ceftriaxone and vancomycin were prescribed for controlling the fever. In the emergency ward, the patient experienced a respiratory depression (Bradypnea) and was immediately transferred to the CPR room and naloxone was injected. Finally, the patient had a partial respiratory recovery.

Laboratory tests revealed leukocytosis ($16.6 \times 10^3 / \text{mm}^3$) with relative differentiation count as neutrophilia (6) lymphocyte (92), monocyte (1), Eosinophil (1). CSF profile: PMN (4-6), RBC (0-1), blood sugar was 183 mg/dl, and bacterial growth was negative.

Computed tomography (CT), electroencephalography and magnetic resonance imaging (MRI) of the brain were performed and there were lesions on brain parenchyma / basal. The brain MRI report showed left and basal temporal oppression, together with left and basal frontal pus.

1.3 Nucleic Acid Extraction

CSF samples (500 μ L) were used for DNA extraction using the Roche DNA blood mini kit (Roche, Germany). The extractions were carried out according to the manufacturer's instructions.

1.4 Real Time PCR

The HSV-1/2 DNA real-time PCR was performed using Gene Proof kit (Czech Republic) at Razi Pathobiology and Medical Genetics Laboratory, Karaj. The HSV-1/2 real-time PCR used fluorescent resonance energy transfer (FRET) probe technology and was performed on the Light Cycler 96 (Roche Co. Germany). A negative extraction control was included with each run to ensure that no DNA contamination occurred during the extraction or amplification phase of testing.

There was a detectable positive signal in patient CSF sample in FAM channel which confirm the presence of Herpes Simplex Virus (HSV) type 1.

The patient was discharged after 20 days of hospitalization and treatment with acyclovir and normal physiological indexes and had a good clinical and neurologic outcome with resolution of all the symptoms.

Infection of central nervous system (CNS) by HSV is rare; however, they are associated with significant mortality and morbidity[6]. Ordinarily, clinical manifestations show low

grade fever along with neurological symptoms which is in agreement with our results[7]. This study reports a case of HSV-1 encephalitis which was confirmed by Real Time PCR from a CSF sample.

Majority of the cases of HSV encephalitis are present with fever and abnormal mental state changes, with progressive symptoms of vomiting, meningismus, headache, diplopia etc. [8, 9]. Consequently, the clinical presentation is variable. In more than 90% of cases of herpes simplex, encephalitis CSF examination shows elevated protein and variable glucose levels[7]. In the present case, glucose and protein level was normal which is in agreement with other studies which reported normal CSF biochemistry [10]. CSF- PCR testing is considered to be the gold standard for the diagnosis of herpes simplex encephalitis and has replaced brain biopsy.

Radiological imaging is also of vital importance. In this study, the patient's MRI brain was suggestive of the left and basal temporal oppression, together with left and basal frontal pus presentation. The standard therapy given in HSV encephalitis is intravenous acyclovir which reduces the mortality to less than 29%.

Acyclovir treatment is lifesaving and needs to be commenced early to ensure an optimal outcome. The same treatment is prescribed in this case study.

2. Conclusion

We would like to highlight that, despite the normal biochemical CSF, imaging results and PCR are the convinced evidence of HSV encephalitis.

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Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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