

# Analysis on the Influencing Factors of Mri Diagnosis of Viral Encephalitis

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**Abstract:** Viral encephalitis is a kind of disease caused by nervous system virus infection, which is more common in children. From the point of view of sequelae of this disease, neglect of treatment will lead to disability, and the incidence rate is high. So early detection, early treatment become the key. For the early diagnosis of viral encephalitis, mainly because it's similar to other fever, there is a certain degree of difficulty in clinical judgment. Especially in the later stage, serious symptoms such as disturbance of consciousness will appear, which will affect patients' health. Therefore, whether MRI diagnosis can be used to achieve early detection is the more concerned content of domestic and foreign medical circles. For viral encephalitis, EEG, cerebrospinal fluid detection and CT are more common for a long time, while MRI for cranial imaging examination is relatively less used. However, MRI was the most accurate from the effect of clinical diagnosis. This paper will discuss the influencing factors of the accuracy of diagnosis.

## 1. Introduction

Viral encephalitis, mainly acute viral encephalitis, is one of the most common infectious diseases in the central nervous system. It shows two characteristics: one is the acute course of disease; the other is the poor prognosis. Then patients need timely diagnosis and treatment. Professor Taylor, an American scholar, published a review in the New England Journal of Medicine, putting forward his own views on the diagnosis and treatment of this kind of acute viral encephalitis, but from the perspective of diagnosis, how to use MRI is an important strategy. Due to fever, encephalitis can cause a lot of nervous system lesions, such as epilepsy, nervous system defects, increase of cerebrospinal fluid cells and syndrome characterized by abnormal neuroimaging and electroencephalogram [1]. The common disease is acute viral encephalitis caused by neurovirus, among which we are familiar with herpes simplex virus (HSV), varicella zoster virus (VZV), enterovirus and arbovirus. From the clinical and MRI diagnosis, their imaging judgment is obviously very important. The symptoms and signs of focal patients have specific brain dysfunction, while the symptoms of diffuse patients include diffuse brain edema, generalized epilepsy and psychiatric symptoms. The virological causes of the two types are different.

## 2. Clinical Situation of Viral Encephalitis

For viral encephalitis, because of its acute onset, there is a certain possibility of misdiagnosis, so it not only needs to observe the clinical symptoms, but also needs MRI examination of head imaging, to achieve accurate diagnosis of the disease. In addition fever, headache, vomiting and other symptoms, some patients with viral encephalitis will have neck stiffness, pain and other conditions, at the same time, viral encephalitis can affect the cerebral vascular circulation, which is easy to form acute blood infarction and then lead to "stroke" and other situations. We need to attach great importance to this disease. At present, the main treatment methods are: drug treatment, food treatment and professional nursing. From the perspective of treatment strategy, three guidelines must be met: first, symptomatic treatment; second, supportive treatment; and finally, prevention and treatment of complications.

## **2.1 Drug Therapy as the Main Treatment**

From the current effective treatment of viral meningitis, there is no so-called special drugs, mainly some antiviral drugs, such as Acyclovir. The dosage of this medicine is usually taken three times a day. In fact, there is another drug of choice for viral meningitis, genciclovir. It works fast, but the dosage is usually taken twice a day.

## **2.2 Food Therapy as a Supplement**

For patients with viral encephalitis, since there is room for food therapy for all diseases, especially for patients with viral encephalitis, support for the drug treatment system is met through daily nutrition, for example, patients can eat foods rich in vitamins and protein, and eat more vegetables and fruits. If there are patients with dysphagia, it is recommended not to eat raw or hard food, and they must swallow slowly. If dysphagia does exist, a liquid diet is necessary.

## **2.3 Indispensable Routine Care**

Many patients with viral meningitis should stay in bed, which is very useful for improving their antiviral ability. At that time, through professional nursing training for family members, the family can master more methods in accompany, such as strengthening skin care and psychological treatment, to ensure that patients are in good moods. People should attach great importance to the diseases related to the brain. They should go to the hospital for physical examination, prevent the disease in advance and make full preparations.

## **3. Mri Examination of Viral Encephalitis**

At present, Siemens verio-3.0t superconducting magnetic resonance scanner is commonly used in MRI examination. Patients undergo spin echo T1WI and fast spin echo T2WI. According to the length of the repeated time and echo time of the two scans, the matrix size of the disease area was judged and analyzed, such as the thickness and spacing of the layers, and the DWI and flair parameters of the inversion recovery sequence [2].

### **3.1 Grading Standard of Abnormality According to Mri**

In the judgement standard, mild inhomogeneous lesions involve single lobe, with high flair signal, high T2WI signal, patchy lesion and low signal of T1WI; moderate inhomogeneous lesions involve more than two lobes (including two), unilateral abnormalities of bilateral ventricles, high signal of flair, high signal of T2WI, asymmetric patchy, low signal of T1WI and T1WI; severe inhomogeneous lesions of bilateral cerebral lobes involve brainstem, with high flair signal, high signal of T2WI and low signal of T1WI. MRI imaging points locate in the internal and external capsule and gray matter. The distribution of lesions is mostly bilateral symmetry, and the distribution and range of frontal lobe and temporal lobe are asymmetric; the lesions are mostly cerebral gyrus, patchy, large volume, unclear boundary with surrounding tissues, and large lesions in frontal lobe and temporal lobe show obvious swelling [3]. On T1WI, most lesions were hypointense, and a few were isointense and obviously hypointense; T2WI showed patchy hyperintensity with a small amount of mixed signal; flair showed high signal; DWI showed some lesions were limited in diffusion. Most of the coronal and sagittal images showed inhomogeneous enhancement and a few showed local significant enhancement.

### **3.2 Immunological and Virological Detection of Cerebrospinal Fluid Needed in Diagnosis of Viral Encephalitis**

Cerebrospinal fluid examination is invasive for a long time, which can not directly show the lesion location and related signs. The development of imaging technology makes it more effective in the diagnosis of viral encephalitis. Because of its non-invasive characteristics, the positive rate of MRI in the diagnosis of viral encephalitis (98.30%) was significantly higher than that of CT (85.67%). MRI has good spatial localization effect, good localization effect on soft tissue, high resolution, and is not easy to be disturbed by the outside world. It can clearly show the difference

from other diseases. For small lesions and early lesions, the detection rate is high. Most of the coronal and sagittal enhanced MRI showed inhomogeneous enhancement, which is helpful to distinguish the lesion from the normal tissue. However, when the nature of viral encephalitis lesions is diffuse, CT can't detect early and small lesions, and morphological changes. MRI is superior to CT in detecting the lesions located in frontal and temporal lobes of children with viral encephalitis. Mainly because MRI parameters are multi-dimensional, the diagnosis of frontal and temporal lobe lesions is more sensitive and accurate than CT. In addition, MRI is superior to CT in the diagnosis of multiple lesions of viral encephalitis in children.

#### **4. Discussion on Influencing Factors of Mri Diagnostic Accuracy of Viral Encephalitis**

From the imaging point of view of viral encephalitis, it is mainly based on the sequential or simultaneous occurrence of edema or vascular edema caused by viral infection, which is a basis for early MRI judgment, and the edema will further dissolve cells, causing local or larger range of diffuse neuronal loss, or demyelinating changes. From different imaging effects of MRI, we still need to base on imaging principles, combine with the effect of lesion display to make a comprehensive judgment. MRI is very sensitive to the pathological changes of edema, for example, for children with viral encephalitis, long T1WI, long T2WI signal can be displayed. Therefore, from this point of view, MRI diagnosis signal is relatively strong and has clinical value.

#### **5. Conclusion**

MRI is a clinical diagnostic method of viral encephalitis, which is widely carried out in many large hospitals. It is characterized by rapidity and no radiation damage to children. And it is sensitive to viral encephalitis. In particular, the abnormal high signal of cerebrospinal fluid is an important influencing factor for the clinical accuracy of diagnosis of viral encephalitis. Therefore, from this point of view, MRI can not only provide diagnosis and treatment for clinical, but also provide help for follow-up treatment and prognosis recovery of patients.

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