

# An Immunocompetent Patient With a Vesicular Rash and Neurological Symptomatology

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## Abstract

Viral infection is the most common cause of aseptic meningitis with the majority in the United States being caused by enteroviruses. In viral meningitis, cerebrospinal fluid (CSF) shows a mild pleocytosis with a lymphocytic predominance, elevated protein and normal glucose level. Nucleic acid amplification methods have greatly improved the detection of viral pathogens. In our case, a 47-year-old Caucasian female patient presented with a persistent throbbing headache for six days, localized to the frontal area, associated with photophobia, exacerbated by bright lights and loud noises. Physical examination revealed nuchal rigidity and a vesicular rash at the right T4-T6 dermatome region. CSF findings were consistent with aseptic meningitis and polymerase chain reaction (PCR) was positive for VZV. Clinical improvement in meningeal signs and symptoms occurred after the initiation of acyclovir to complete a total 10 day course. There are no published data revealing that acyclovir will modify the course of VZV meningitis, but it is important to recognize the potential clinical benefit with the early initiation of antiviral therapy, especially if a zoster rash is discovered on examination. However, this is rarely the case because the majority of VZV meningitis will not present with a rash. Even though the reactivation of VZV is not usually associated with clinical meningitis; it is important to consider VZV in the differential diagnosis of a patient presenting without a rash with CNS disease. PCR has been proven to be useful and quick diagnostic tool in the early diagnosis of VZV associated neurological disease.

**Keywords:** Headache; Varicella Zoster virus; Aseptic meningitis

## Introduction

Aseptic meningitis will frequently have a similar presentation to bacterial meningitis such as fever, headache, altered mental status (AMS), stiff neck and photophobia. In the majority of patients with aseptic meningitis, the clinical course will be self-limited and eventually resolve without specific therapy. AMS is an important distinguishing feature between encephalitis and meningitis. Viral infection is the most common form of aseptic meningitis; other viral infections that can lead to meningitis includes mumps, arbovirus, measles, influenza, human immunodeficiency virus (HIV), West Nile virus (WNV), herpes virus such as herpes simplex virus, epstein-barr virus and varicella zoster virus, or in rare cases lymphocytic choriomeningitis virus [1].

A detailed history and physical examination can provide a clue as to the etiologic diagnosis. In viral meningitis, CSF will show a mild pleocytosis with a lymphocytic predominance, elevated protein and normal glucose level. Nucleic acid amplification methods such as PCR have greatly improved the detection of viral pathogens. Magnetic resonance imaging (MRI) should be considered for any patient that presents with clinical signs or symptoms suggesting encephalitis.

Skin manifestations may suggest the diagnosis of aseptic meningitis from certain causes. Examples include a vesicular rash of varicella zoster, the genital lesions of HSV-2, or a mild maculopapular rash occurring in the summer and fall months with some enteroviruses. The potential manifestations of VZV reactivation include herpes zoster, postherpetic neuralgia, aseptic meningitis and encephalitis, Ramsay Hunt syndrome, and herpes ophthalmicus. Herpes zoster is the most common presentation of reactivated VZV with the majority of cases occurring in adults. Patients will typically report a prodromal illness of pain, pruritus, burning, or paresthesias. Over the course of a few days, erythematous macules and papules develop along a single dermatome progressing to vesicles that eventually crust and heal over. Simultaneous involvement of the brain, spine and meninges in response to VZV reactivation is rare in general except in cases of immunocompromised patients [2].

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**Figure 1.** demonstrates the skin involvement characterized through vesicular rash extending over the dermatome T4-T6.

## Case Report

Forty-seven year-old Caucasian female patient presented with a persistent throbbing headache for six days, localized to frontal area, associated with photophobia, exacerbated by bright lights and loud noises. She denied any sick contacts or recent travel. Other associated symptoms included nausea, vomiting, bilateral tinnitus, loss of balance and fatigue. No fevers, chills, sore throat or change in mental status. No past medical problems.

Initial vital signs on admission include were normal except for stage 2 hypertension (161/79 mmHg). Pertinent physical examination findings was that she was alert but in mild distress secondary to pain and photophobia. Her pupils were equal round and reactive to light with intact extraocular movements. Nuchal rigidity was present. Skin examination revealed a painful vesicular rash at the right T4-T6 dermatome region near the right breast as demonstrated in Figure 1. No focal neurological deficits noted. She had a negative Kernig and Brudzinski sign.

Initial laboratory work-up was unremarkable. CSF assessment revealed colorless and clear fluid with WBC of 648 per  $\mu\text{L}$  and lymphocytes of 92%, RBC of 47 per  $\mu\text{L}$ , protein 396 mg/dL, sodium 151 mmol/L and glucose 41 mg/dL. CSF antigens were negative for group B streptococcus, haemophilus, *S. pneumoniae* and *N. meningitidis*. Other CSF results included a coccoioides antibody in CSF, herpes-simplex-PCR, west nile virus IgM and IgG which all were negative.

Empiric therapy of vancomycin 1 g IV BID, ceftriaxone 2 g IV daily, dexamethasone 10 mg IV every 6 hours and acyclovir 800 mg PO every 4 hours were initiated upon admission. The infectious disease team was consulted and agreed with initial management and likely etiology of VZV meningitis. The antibiotic regimen and dexamethasone was discontinued after CSF cultures were negative for 48 hours.

ON the second hospital day her clinical symptoms had significantly improved. The PCR for VZV in CSF was positive by the third day. The CSF culture, CSF fungal culture, blood culture and acid-fast-bacilli culture were all negative. The electroencephalogram, CT brain and MRI brain were all unremarkable. The patient was discharged on the third hospital day with instructions to continue acyclovir 800mg PO every 4 hours for 7 more days.

## Discussion

The specific therapeutic approach to a patient with viral meningitis will depend upon the clinical presentation of the patient and the existence of underlying factors. Empiric therapy with antibiotics for 48 hours should be considered even if viral meningitis is suspected, in the elderly, immunocompromised. Otherwise it is reasonable to observe the clinical status of the patient without antibiotic therapy. Enterovirus infection is the most common cause of viral meningitis in immunocompetent adult [3]. Neurological complications of VZV-infection are important to recognize due to the associated morbidity and mortality and the potential benefit with the early initiation of antiviral therapy [4]. However, there are no published data to support that acyclovir will modify the course of HSV or VZV meningitis. Even in the absence of a vesicular rash, VZV should be in the differential of causes of aseptic meningitis. The reactivation zoster rash of VZV is seldom associated with aseptic meningitis. The clinical implications are important because VZV meningitis may not be considered in the differential diagnosis of a patient presenting without a rash [5]. HSV-2 and VZV neurological infection are associated with a higher CSF protein level compared to enteroviral infection [6]. The PCR is a quick diagnostic tool for the early diagnosis of VZV associated neurological disease. The clinical diagnosis of VZV meningitis is easily thought of with the appearance of the typical zoster rash however in the absence of vesicular eruptions the PCR assay can be a valuable tool [7].

## Disclosures

All participated authors in this study declare no financial, professional or personal conflicts.

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