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VARICELLA ZOSTER VIRUS AND MENINGITIS IN IMMUNOCOMPETENT PATIENT- CASE REPORT

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ABSTRACT

Varicella zoster virus reactivation, also known as herpes zoster is common in older adults and immunocompromised individuals and often causes a painful, vesicular rash limited to a dermatomal distribution. On occasion, it can lead to various neurological complications as well. Meningitis caused by varicella zoster virus infection is uncommon in immunocompetent patients. We report the case of a 49-year-old male patient that presented with a one-week history of persistent headache that did not resolve with analgesics. He was previously healthy and immunocompetent, with a history of chickenpox in childhood. The CSF PCR analysis revealed a VZV infection causing acute aseptic meningitis with no shingles rash eruption on physical examination. Intravenous treatment with Acyclovir was started and following a three-week treatment course, the patient was discharged in good general condition with normal CSF results.

Keywords: Aseptic meningitis, Varicella Zoster Virus, Acyclovir, Immunocompetent

INTRODUCTION

Varicella zoster virus, a member of the Herpesviridae family, is a DNA virus. When a person comes into contract with VZV, the individual initially develops varicella. After this acute episode, the virus remains latent in the cranial nerves, dorsal roots and autonomic ganglions. In most cases the virus stays dormant for decades until the host's VZV-specific immunity declines, allowing the virus to reactivate spontaneously. This results in shingles (herpes zoster) and is typically characterized by pain and a rash in a dermatomal distribution.[1]. This reactivation can also result in specific neurological complications: Ramsay Hunt syndrome, encephalitis, peripheral motor neuropathy, myelitis, Guillain Barré syndrome, stroke with VZV vasculopathy and isolated clinical meningitis. [2,3]. VZV meningitis was first described in the 1980s in immunocompetent patients and it is considered the third leading cause of viral meningitis today (after Enteroviruses and Herpes simplex virus type 2). Advances in PCR techniques in the 1990s enabled to detect viral DNA in the cerebrospinal fluid of patients with shingles and neurological signs. [4]. VZV encephalitis is known to be associated with high mortality risk and significant neurological sequelae despite treatment with Acyclovir.

However, this type of encephalitis predominantly occurs in immunocompromised patients. In contrast, VZV acute isolated meningitis appears to show a favourable course and treatment outcome. Traditionally VZV meningitis has been treated with IV Acyclovir in accordance with the *Infectious Diseases Society of America* (*IDSA)* treatment guidelines.[5]

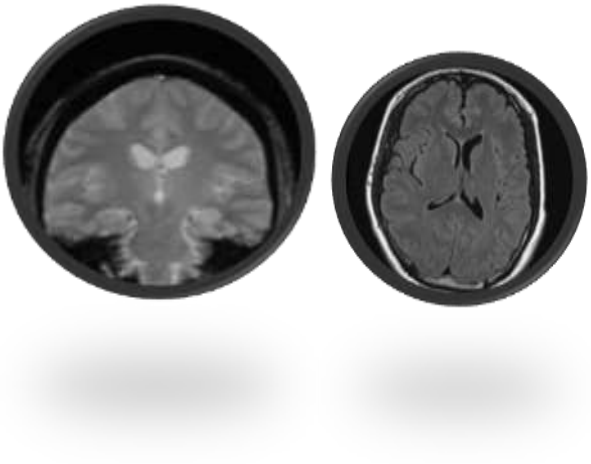
We report a case of a reactivation of VZV infection leading to acute aseptic meningitis with no rash present in a previously healthy immunocompetent 49-year-old male.

Case Presentation

A 49-year-old male patient without significant medical history, was hospitalized at the University Clinic for Infectious Diseases due to one-week history of persistent, diffuse headache that did not resolve with analgesics, accompanied by nausea, vomiting and photophobia. The patient was initially hospitalized at the Clinic of Neurology for two days, where a CTM scan and CT

angiography of the cerebral vessels were performed, both showing normal results. Laboratory and biochemical tests were normal with no inflammatory markers. An infectious disease specialist was consulted. During the clinical examination, the patient was found to be febrile, conscious, communicative, oriented, with positive meningeal signs. A lumbar puncture was performed, revealing cerebrospinal fluid findings including pleocytosis of 285 cells/μL, lymphocytic predominance of 92%, lactate levels of 2.02 mmol/L, protein levels of 0.8 g/L, and glucose levels of 2.7 mmol/L. PCR testing of the cerebrospinal fluid identified the Varicella Zoster Virus. Intravenous treatment with Acyclovir was started at a dose of 15mg/kg every eight hours. On the second day of hospitalization, the patient developped diplopia. An ophthalmological examination and MRI of the head were performed, which revealed increased intracranial pressure. Anti-edema therapy together with Acetazolamide 250 mg were added to the treatment regimen.The patient remained afebrile, hemodynamically stable, with preserved consciousness throughout the hospitalization. No skin changes were observed, and laboratory and biochemical analyses were normal. Microbiological and serological tests for other infections were negative. In the second week, there was a gradual regression of meningeal symptoms, improvement in vision and overall clinical improvement. After a three-week treatment course, the patient was discharged in good general condition with normal lumbar puncture results and a normal control MRI of the head. The patient was followed up after discharge and was doing well with complete resolution of symptoms.

	First lumbal puncture (26.05.24)	II lumbal puncture (08.06.24)	III lumbal puncture (15.06.24)
Pleocytosis	285cells/μL	85cells/μL	10cells/μL
Ne	8%	10%	/
Ly	92%	90%	/
Alb	0,81g/l	0,56 g/l	0,50 g/l
Lac	2,02 mmol/L	2,07 mmol/l	2 mmol/l
Glu	2.7 mmol/L	3,6 mmol/l	3,2 mmol/l
PCR (csf)	VZV	/	/



DISCUSSION

Several studies conducted in patients with herpes zoster have demonstrated that subclinical meningeal irritation can occur in 40–50% of cases, but a careful review of the literature showed that VZV-related neurologic disease can occur in absence of the classic herpes zoster exanthema, even in immunocompetent patients. [6] This may confirm the ability of the latent virus in the spinal ganglia to travel directly to the central nervous system without the classical skin involvement. [7]. Our case demonstrates the same phenomenon, but with increased intracranial pressure as a predominant clinical feature. The mechanism behind this increase remains poorly understood. Further explanation suggested by Lo et al. is the post-infectious allergic response to the causative virus and diffuse brain swelling. [8]. Some cases have been reported in the literature of reactivation of VZV with direct invasion of cranial nerves in otherwise immunocompetent patients. In particular, one case exhibited involvement of CN VI with increased intracranial pressure and bilateral papillary edema. [9] . Our case points out the unusual course of the disease, in absence of neuralgia and exanthema. Even more, there were no potential risk factors or conditions causing immunosuppression in the patient. The patient underwent a series of investigations, including testing for the human immunodeficiency virus (HIV), which was negative. In our case, treatment was carried out with intravenous Acyclovir at a dose of 15 mg/kg, for a duration of three weeks, considering the complexity of the case, the appearance of diplopia and the MRI findings of the head. [10]

CONCLUSION

Our case highlights that even in relatively low-risk patients, physicians must maintain a high level of clinical suspicion for the complications of VZV reactivation. This case demonstrates that VZV may be considered in cases of aseptic meningitis in immunocompetent individuals, even without exanthema, and it may increase the intracranial pressure, leading to symptoms, and causing reversible neurological deficit. A timely recognition and initiation of specific treatment with Acyclovir significantly contributes to the positive outcome of the disease and reduces the risk of complications associated with the infection.

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