Case report

Varicella Zoster meningoencephalitis in a patient exposed to HIV / AIDS: case report

ABSTRACT

Aims: To report an unusual case of herpes zoster meningoencephalitis in an immunocompetent patient exposed to HIV/AIDS.

Presentation of Case: The present report deals with an immunocompetent patient who was diagnosed with meningoencephalitis caused by Herpes Zoster, an opportunistic infection that presented complications.

Discussion: Varicella-zoster virus (VZV) is a pathogenic human herpes virus that causes chickenpox as a primary infection, after which it becomes latent in the peripheral ganglia. Later, the virus can be reactivated spontaneously or after a series of triggers to cause herpes zoster. Chickenpox and its complications are more severe in immunosuppressed patients.

Conclusion: An unusual case of varicella zoster meningoencephalitis in an immunocompetent patient that deserves to be shared with colleagues.

Keywords: Encephalomeningitis; Human Herpesvirus 3; Acquired Immune Deficiency Syndrome; Zoster Encephalitis, Varicella.

1. INTRODUCTION

Varicella zoster virus is a contagious viral infection caused by VZV [1]. VZV reactivation can infect meninges, brain parenchyma and nerve roots, causing meningoencephalitis, which may or may not have skin rashes [2]. Vesicular erythema eruptions, commonly limited to a dermatome, are characteristic of Herpes Zoster [3]. Immune disorders and infectious diseases can cause encephalitis, a neurological syndrome characterized by inflammation in brain parenchyma, which manifests as fever, headache, altered level of consciousness, seizures and/or focal neurological signs [4].

One of the causes of status epilepticus is varicella encephalitis [5]. Generalized status epilepticus in adults and children over 5 years old refers to 5 minutes of continuous seizures or two or more mild seizures between which there is incomplete recovery of consciousness [6]. In addition, there was the development of rhabdomyolysis, which can be caused by diseases, injuries, drugs and toxins, with the main complication being Acute Kidney Injury (AKI), which can appear in 4% to 33% of patients [7]. It is also important to

note that VZV reactivation is less common in immunocompetent patients compared to AIDS [8] and, in the case presented, despite the patient having unprotected sex for 10 years with his wife, who is HIV + and has a detectable viral load, he has a normal immune system and negative HIV serology, thus considering the possibility of treating an elite controller.

We present the report of a patient with abstinence from drugs and alcohol who sought care due to holocranial headache and changes in strength and gait, being diagnosed with meningoencephalitis caused by Herpes Zoster. Opportunistic infections and neurological disorders have been associated with chronic immune activation and low-grade inflammation developed by elite controllers [9]. Furthermore, the use of acyclovir has been related to rhabdomyolysis and, as a consequence, to AKI. Therefore, the aim of this report is to present the unusual case of an immunocompetent patient who presents an opportunistic infection with complications. This situation, combined with the patient's history, could be justified because it is a possible elite controller for HIV. Although elite controllers represent a minority of those infected with HIV, this report seeks to share with colleagues the possible complications related to this atypical condition. The patient was recruited and accepted to participate in a research carried out in the ICU with CAEE number: 91988318.6.0000.5336 - Brazil. The case is reported here for sharing with colleagues.

2. PRESENTATION OF CASE

Male patient, 36 years old, Brazilian, married, arrived at the hospital emergency room in February 2020 with a complaint of holocranial headache for one week and with changes in strength and gait for three days. The patient had been abstinent from crack and alcohol for three months and with a history of traumatic brain injury for 10 years. His wife was diagnosed with HIV/AIDS 10 years ago and had been in regular treatment for six months (at the time of her partner's hospitalization), with a still detectable viral load. According to her, the patient (her partner) had negative serology tests for HIV/AIDS despite having unprotected sex.

On physical examination, the patient was afebrile, with herpetiform lesions in the posterior left hemithorax – in a dermatome – suggestive of Herpes Zoster. During the evaluation, he had two convulsive episodes and received intravenous diazepam (5 mg/ml) between attacks, but there was no recovery of consciousness. Family member denies a previous history of seizures and continuous use of medications. The patient evolved without spontaneous eye opening, with miotic pupils and without vocalization. Orotracheal intubation and mechanical ventilation (MV) were necessary to protect the airways due to the lowering of the sensorium after administration of medications to control seizures.

The laboratory exam revealed mild leukocytosis without deviation, loss of renal function, with probable acute etiology, elevated creatine kinase and cranial Computed Tomography (CT) without acute alterations. Lumbar puncture was performed for analysis of cerebrospinal fluid (CSF), with clear fluid output without complications. Considering the set of neurological manifestations presented by the patient, allied to herpetiform lesions in the dermatome and CSF data, acyclovir associated with ceftriaxone was started as empirical coverage. CSF analysis without particularities, in addition to negative bacterioscopic and Alcohol-Acid Resistant Bacillus (BAAR). The patient was on MV, contained in bed, interspersed with periods of agitation, with the need for repeated periods of sedation. Neurological examination showed no response to painful stimuli and signs of seizures; pupils were isomyotic and the Richmond Agitation and Sedation Scale (RASS) showed a score of -5. The neurologist's evaluation indicated a compatible picture of epileptic status due to a probable viral meningoencephalitis.

Subsequently, the patient did not tolerate a break in sedoanalgesia and had worsening of renal function, being admitted to the Intensive Care Unit (ICU). KDIGO III acute kidney injury due to rhabdomyolysis was found. Because of this, the dose of acyclovir was

adjusted. Urinary tract ultrasound was requested and the infusion of bicarbonate solution increased to 150 mL/h, in order to alkalinize the urine. In an attempt to wean from sedation, the patient presented convulsive crises and went into *status epilepticus*, a condition resolved with the application of midazolam and restart of sedoanalgesia. Still on the second day of hospitalization, the first therapeutic regimen with antiepileptic drugs was started. Despite sedation and the use of phenytoin, the patient continued to develop occasional epileptic seizures. The new CSF examination revealed a reduction in cellularity, still with a predominance of lymphocytes/monocytes (99%), with no identified germs and a reduction in proteins. Subsequently, sedation reduction was started for a better neurological assessment. On physical examination, he responded to commands with all four limbs, pupils were isochoric and photoreactive. He was sleepy, waking up on call, responsive to simple questions with a nod of the head, with recovered renal function and no new seizures. On that same day, successful extubation was carried out. Control EEG showed important improvement, with very rare focal epileptogenic potential activity.

Patient continued with improvement in clinical condition, globally oriented, but with speech with a tendency to magical content (suspected delirium). On physical examination, she remained without apparent facial asymmetries when she forced a smile. Symmetrical strength and global grade 3+ reflexes, no clonus or increased reflex area. The patient was discharged from the ICU in good clinical condition, with no complaints and no new seizures. He was hospitalized in the ward until the end of treatment with acyclovir, on the twenty-first day of hospitalization, and after that he was discharged.

The status epilepticus in a patient without a history of epilepsy, associated with Herpes Zoster in the chest, suggested a picture of herpetic encephalitis or meningitis. The medical hypothesis for the seizures was viral meningoencephalitis (which was confirmed by the presence of the etiologic agent varicella zoster in the CSF). The hypothesis of rhabdomyolysis was presented by the use of acyclovir.

3. DISCUSSION

The patient listed here was diagnosed with viral meningoencephalitis due to varicella zoster. Varicella zoster is a contagious viral infection caused by VZV [1]. The first contact with VZV causes chickenpox, after which the virus is latent in cranial nerve ganglia, dorsal root ganglia and autonomic ganglia along the neuroaxis, so when the individual has a decline in the immune system, the VZV is reactivated and causes herpes zoster [10]. VZV reactivation can infect the meninges, the brain parenchyma and nerve roots, causing meningoencephalitis, and can cause skin rashes [2].

Encephalitis is a neurological syndrome characterized by inflammation in the brain parenchyma, which can have different origins, including immunological disorders and infectious diseases, and manifest as fever, headache, altered level of consciousness, seizures and/or neurological focal signs [4]. In this case, the patient has holocranial headache, changes in strength and gait, and convulsive episodes. A study of patients hospitalized for encephalitis revealed that the mean age of patients with VZV etiology is 44 years and that, although most patients with viral encephalitis have fever, a VZV etiology was an exception [11]. It was also noted that seizures were not common in preference to VZV encephalitis [11]. Although in the case presented, the patient is also afebrile and with an age close to the study average, the patient is an exception with regard to seizure episodes. Another important factor is that VZV reactivation in the CNS is more common in AIDS patients compared to other immunodeficiency and immunocompetent patients [8]. Individual risk factors are unknown, but recent data are consistent with genetic risk factors [12].

In the case presented, the patient has a normal immune system, despite having unprotected sex with his wife for 10 years, with an HIV+ test and detectable viral load. The patient was tested twice during hospitalization and had negative HIV serology, as well as in tests in previous years. Thus, it can be suggested that the reported case is an elite

controller. Elite controllers represent a minority of infected people who are able to maintain HIV viral load levels below the detection limit of the tests, such that these individuals are infected but remain clinically and/or immunologically stable for years [13]. This spontaneous control of HIV was associated with chronic immune activation and low-grade inflammation, which can increase the risk of complications such as opportunistic infections and neurological disorders [9], as happened with the patient in the present report who, despite not being immunodeficient, had the reactivation of an infection that occurs predominantly in people with some damage to the immune system. A study comparing the effect of hepatitis C virus (HCV) co-infection in HIV elite controllers showed that there is an increased likelihood of developing complications in patients with both infections, due to higher levels of cell activation [14]. Given the above, it can be observed that although an elite controller manages to maintain low levels of HIV viral load, he can present more complications when he has another infection, such as the VZV presented in the present case, or HCV as mentioned in the study [14].

Regarding status epilepticus, it is known that it is a common neurological emergency that requires immediate treatment [6]. Overall mortality associated with status epilepticus approaches 20%, with generalized seizure status accounting for about 45-74% of all cases, and outcomes are more harmful when seizures are prolonged [15]. As a definition, generalized status epilepticus in adults and children over 5 years of age refers to 5 minutes of continuous seizures or two or more discrete seizures between which there is incomplete recovery of consciousness [6]. In the present case, the patient had no previous history of epilepsy, which suggests a relationship with the infectious mechanism caused by Herpes Zoster.

Another important element was rhabdomyolysis due to the use of acyclovir and subsequent AKI. Rhabdomyolysis is a condition resulting from the degradation of muscle tissue and, consequently, from the extravasation of myoglobin and other intracellular proteins and electrolytes into the circulation. This syndrome can be caused by diseases, injuries, medications and toxins, with AKI as the main complication, and may appear in 4% to 33% of patients [7]. Although not common, cases of VZV meningoencephalitis accompanied by rhabdomyolysis have been reported [16]. For the treatment of viral infections, acyclovir is usually used; however, this drug used intravenously has an important association with AKI [17], and may have a worsening of the AKI picture when administered in association with ceftriaxone [18], as shown in the case reported.

4. CONCLUSION

We describe an atypical case of viral meningoencephalitis caused by VZV in a drug-using patient and possible elite controller. Despite drug addiction and documented HIV infection considered risk factors, among many others, for VZV reactivation in adulthood. Further studies are needed to assess the immunocompetence and risk profile of HIV elite controllers. It is also up to the physician to know how to detect the symptoms of the disease early and institute treatment as soon as possible. Despite the unusual and complicated picture, the patient presented a positive outcome with the proposed treatment, being discharged from the hospital after 21 days of hospitalization, and without sequelae.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

The present work was approved by the PUCRS Research Ethics Committee.

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APPENDIX