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CASE REPORT

Enteroviral encephalitis with neurological sequelae treated successfully with corticoids

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Encephalitis, Nervous System Diseases, Enterovirus Infections, Immunotherapy.

Abstract

Enteroviral infections are a common condition in childhood that may compromise the central nervous system. The primary concern is the absence of specific treatment for severe cases. Data report uses immunotherapy to reduce neurological sequelae, with limited studies evaluating its efficacy and safety. This case describes enteroviral encephalitis with neurological sequelae, treated successfully with corticosteroids.

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INTRODUCTION

Enteroviruses are a common etiology of viral disease in children, accounting for 44% of reported cases in children under one-year-old. Encephalitis is one of the most severe manifestations, and there is no specific treatment, even though immunotherapy has been proposed for severe cases with neurologic impairment. This case report shows a severe case of enteroviral encephalitis with neurologic sequelae, treated successfully with corticoids.

Approval for this study was obtained from the institutional review board of *Hospital Universitário da Universidade de São Paulo*, São Paulo, Brazil.

CASE REPORT

A 3-year-old previously healthy girl presented at the pediatric emergency department with fever, occipital headache and vomits, evolving with sleep disturbance, ataxia, dysarthria, and dysphagia. Cerebrospinal fluid (CSF) was analyzed, showing cells 392/mm^2, red blood cells 29/mm^2, neutrophils 29%, lymphocytes 63%, monocytes 8%, proteins 85mg/dl, glucose 68mg/dl, lactate 21mg/dl. The cranial computed tomographic scan didn't reveal abnormal findings.

It was suspected meningoencephalitis and initiated ceftriaxone and acyclovir. New symptoms appeared 24 hours after the admission, including tetraplegia, aphasia, facial palsy and worsening of dysphagia, requiring transference to the intensive care unit, likewise oscillation of consciousness level, demanding orotracheal intubation for three days. The patient received ten days of ceftriaxone and 14 days of acyclovir without any neurologic improvement. Acute disseminated encephalomyelitis (ADEM) was also suspected, and it was initiated pulse therapy with methylprednisolone 30mg/kg/day for five days, presenting rapid and definitive improvement of neurologic symptoms; nonetheless, cranial magnetic resonance imaging (MRI) showed no specific findings of ADEM.

CSF protein chain reaction (PCR) result was positive for enterovirus and bacterial cultures negative. Treatment was continued with prednisolone 2mg/kg for two weeks and four more weeks taper. One and half months after the initial presentation, the patient was discharged with almost complete neurological recovery, presenting myoclonus in the right hand, mild dysarthria and deviation of the left commissure.

DISCUSSION

Enteroviruses are one of the most prevalent etiology of viral infections in children, causing a wide variety of clinical illnesses. Encephalitis has a prevalence ranging from <1% to 15%[1,2] and mortality rates as high as 14%[1-5] The most frequent symptoms are fever, myoclonus, ataxia, limb weakness, cranial nerve dysfunction, all presented in the case[3].

In the initial approach of encephalitis, without etiology identification, is empiric treatment with acyclovir and antibiotic therapy is recommended for coverage of herpes simplex virus and bacteria[6], the most prevalent pathogens. However, for the patient, despite of 14 days of treatment, there was no neurological improvement.

According to World Health Organization (WHO), this case could be classified as encephalomyelitis associated with acute flaccid paralysis[7], and it is recommended immunotherapy for the reduction of neurologic sequelae, specifically, administration of intravenous immunoglobulin (IVIG). There is a relation between severe enteroviral neurological disease and a high level of cytokine production, supporting the idea of using anti-inflammatory therapy to improve outcomes. Historically, IVIG has been used in outbreaks in some countries[8], for severe neonatal cases, immunocompromised patients, autonomic nervous system dysregulation, and cardiopulmonary failure[4,7]. This practice has shown a reduction in mortality rates and improved neurologic prognosis, by controlling inflammation, modulating cytokine production, and neutralizing pathogens[3,9,10]. Nevertheless, for a formal recommendation, more studies are needed[6,11].

In contrast to IVIG, there is little information about the effects of corticosteroids in enteroviral encephalitis. Some studies evaluated its use for immune-mediated disorders, acute flaccid paralysis cases, transverse myelitis, acute disseminated encephalomyelitis, even in association with IVIG, they show favorable effects in neurological recovery because of its anti-inflammatory effect[3,12,13] Other treatment options under investigation include antivirals like ribavirin and pleconaril, acting in the inhibition of replication and virus entrance into the cells, respectively[4,8,14]. Data about the efficacy and safety are limited.

Under the suspicion of ADEM, the patient received high doses of corticosteroid for five days, showing a clinical response at the end of the fifth day of treatment. The cranial MRI was not conclusive for ADEM; CSF PCR was positive for enterovirus, enclosing the case as enteroviral encephalitis. The patient completed six weeks of corticosteroid as immunotherapy, showing progressive recovering of limb movements and amelioration of dysphagia and dysarthria. Neurological recovery time varies with every case, described as 100% recovery in mild cases, even without specific treatment; 77% recovery in 2 months in moderated cases; and almost 90% recovery in 12 months of following immunotherapy[3,15] This patient was discharged one month and a half after the beginning of the symptoms with minimal neurologic sequelae.

CONCLUSION

Immunotherapy appears to be beneficial in neurologic prognosis and must be considered in the treatment of enteroviral encephalitis with severe neurological impairment. Corticosteroids could be an available choice of immunotherapy. Further research is required to establish efficacy.

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