The Egyptian Journal of Internal Medicine

CASE REPORT Open Access

Herpes zoster ophthalmicus and varicella zoster meningoencephalitis in a newly diagnosed case of retroviral disease: a case report

Aniruddha Jog[1], Vinayak M. Sawardekar[1] and Arjun Agarwal[1*]

Abstract

Background Meningoencephalitis and herpes zoster ophthalmicus (HZO) are rare neurological and ocular complications of herpes zoster, respectively. Their co-occurrence is rarer, even in patients with retroviral disease (RVD), and may occur in the presence of normal CD4 count.

Case presentation A 35-year-old woman presented with altered sensorium. Four days back, she developed left-sided severe, deep burning type headache, and on the next day, painful vesicles developed over the left side of the scalp which progressively involved the forehead, upper part of left cheek, and tip of the nose, with swelling around the eyes. Ophthalmic examination revealed conjunctivitis and keratitis suggesting acute HZO. Neck rigidity was present, and MRI brain was suggestive of acute meningoencephalitis. The DNA polymerase chain reaction of cerebrospinal fluid for varicella zoster virus (VZV) confirmed the diagnosis of acute meningoencephalitis. The search for cause of immunosuppression led to the diagnosis of RVD. Treatment with intravenous acyclovir and dexamethasone led to rapid recovery and clearing of lesions.

Conclusion VZV infection should be included in the differential diagnosis among patients with newly diagnosed RVD presenting with meningoencephalitis and HZO.

Keywords Case report, CD4 count, Herpes zoster ophthalmicus, Meningoencephalitis, Retroviral disease, Varicella zoster virus

Background

Herpes zoster (HZ) is a result of reactivation of latent varicella zoster virus (VZV) infection. Patients with retroviral disease (RVD) have 20 times higher risk of VZV reactivation [1]. In these patients, HZ is usually recurrent and lasts longer. It leads to several central nervous system (CNS) and ocular disorders, including meningoencephalitis and herpes zoster ophthalmicus (HZO), respectively [2, 3].

VZV reactivation can occur at any CD4 cell count, but the occurrence is highest when the counts is < 200 cells/μL [4]. Additionally, multi-dermatomal HZ is observed at a lower CD4 count than HZ affecting a single dermatome [1]. Herein, we report a case of acute HZO and acute VZV meningoencephalitis in a newly diagnosed case of RVD with normal CD4 count and involvement of adjacent dermatomes.

*Correspondence:
Arjun Agarwal
arjunagarwal4jun@gmail.com
[1] Department of Medicine, The Grant Government Medical College and Sir J.J. Group of Hospitals, J.J. Marg, Nagpada-Mumbai Central, Near Sandhurst Road and J.J. Police Station, Mumbai 400008, India

Case presentation

A 35-year-old woman presented with altered sensorium for the last 2 days. Four days back, she was asymptomatic, when she experienced left-sided severe headache, deep burning type, not associated with any other symptoms. Next day, painful vesicles developed over the left side of the scalp which progressively involved the forehead, upper part of left cheek, and tip of the nose (Fig. 1A, B). She also had swelling around the eyes. A local practitioner prescribed her topical acyclovir 5% cream following which the vesicles ruptured. In the next 12 h, she became agitated, was not following commands, not recognizing relatives, and was having irrelevant talks, for which she required medical attention. There was no history of photophobia, fever, or vomiting. There was no significant medical history. The history of primary VZV infection was not known. Her family history was significant for untimely death of her husband, the cause for which was not known to the patient or her relative.

On examination, she was awake but delirious, irritable, and not oriented to time, place, and person. Her vital parameters were stable. Local examination of the scalp and face revealed ruptured vesicles present over the left-sided scalp, forehead, associated with severe periorbital oedema and vesicles extending to the tip of the nose. Examination of central nervous system revealed signs of neck rigidity with no other focal neurological deficit. The contrast-enhanced computed tomography of the brain demonstrated subgaleal oedema over left anterior and lateral frontal region with mild left preseptal oedema. Ocular examination revealed conjunctivitis and keratitis, and thus, a clinical diagnosis of acute HZO was reached. She was initiated on acyclovir 10 mg/kg/8 h IV, dexamethasone 8 mg IV 8 hourly, and topical framycetin sulphate 1% cream and potassium permanganate cream over the lesions.

In view of altered mentation with neck rigidity, a lumbar puncture was performed, and cerebrospinal fluid (CSF) examination revealed white cell count of 584/mm^3 with lymphocyte predominance (98%) and raised protein (173 mg/dl) and glucose (152 mg/dl). CSF cryptococcus for India ink was negative, and culture showed no growth of organisms. Due to lymphocytic picture, CSF GeneXpert was done, revealing the absence of *Mycobacterium tuberculosis*. Likewise, VDRL for syphilis was non-reactive. However, the presence of concurrent HZ rash prompted us to perform DNA polymerase chain reaction (PCR) of CSF for VZV, which turned out to be positive.

Further evaluation with magnetic resonance imaging (MRI) of the brain revealed increased T2 weighted/FLAIR cortical intensities in bilateral basifrontal and left temporal and insular areas with meningeal enhancement suggesting meningoencephalitis. To rule out immunocompromised state, retroviral test was performed, which was found to be positive with a CD4 count of 784 cells/mm^3. Thus, she was initiated on antiretroviral drugs tenofovir (300 mg), lamivudine (300 mg), and dolutegravir (50 mg). Following treatment initiation, the patient gained sensorium within 3 days, and lesions started showing recovery after 7 days (Fig. 1C, D). The orbital swelling was nearly resolved, and after 14 days of antiviral therapy, she was discharged in a fully conscious and oriented state, with lesions healed completely (Fig. 1E).

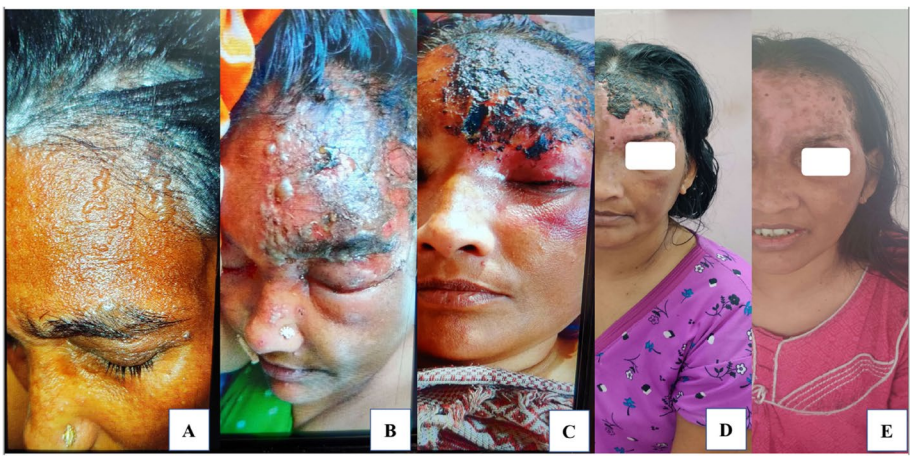

Fig. 1 VZV lesions during the course of the disease. **A** First presentation of VZV lesions. **B** Presentation of rash at admission to the hospital. Hutchison sign present. **C** After initiation of treatment with injectable acyclovir. Initiation of crusting of vesicular rash. **D** Partial healing of lesions. **E** Complete healing of lesions with depigmentation (at discharge)

Discussion

The primary infection with VZV results in varicella, while the secondary infection leads to HZ. Though the former is usually observed in early childhood, the latter is reported due to reactivation of latent infection in cranial nerve or dorsal root ganglia during later adult life [2]. The incidence of HZ rises with age and is even high in immunocompromised individuals. Its incidence in general population is around 0.15–0.33/100 person-years, 0.5–0.9/100 person-years in individuals aged 50–80 years, and 2.9–5.1/100 person-years in patients with RVD [5].

Once reactivated, VZV replicates in the affected neurons. Subsequently, VZV particles are shed from the neuron to the correlating dermatome. In the involved dermatome, VZV induces inflammation and vesiculation. Thus, the pain in HZ is a result of nerve inflammation. The dermatomal vesicular eruptions are usually predated by prodromal pain, tingling, or itching for at least 2 days. Some cases may present with non-cutaneous symptoms including photophobia, headaches, and general malaise [6]. In our case, severe headache preceded the onset of painful vesicular eruption by a day.

Characteristically, HZ occurs unilaterally, does not cross the midline, and remains localized to a single dermatome of a single sensory ganglion. However, adjacent dermatomes are affected in 20% cases. HZ most frequently affects the thoracic nerves and the ophthalmic division of the trigeminal nerve [7]. Likewise, in our case, the vesicles were unilateral and involved adjacent dermatomes, predominantly V1 and few lesions on V2. Additionally, our case had normal CD4 count, and this finding is contrary to an observation that patients with normal CD4 count usually have involvement of single dermatome.

In our patient, ophthalmologic examination led to the diagnosis of acute HZO. HZO is reported in 10–20% HZ episodes and can affect the entire eye, leading to keratitis, scarring, and visual loss. An initial marker of this condition is the presence of vesicles on the tip, sides, or root of the nose (Hutchinson sign) [7]. Likewise, in our case, HZO was diagnosed clinically, and the presence of conjunctivitis and keratitis was noticed. Also, characteristic Hutchinson sign was observed. Thus, our patient had characteristic findings of HZO.

In around 2% patients with RVD, VZV reactivation leads to CNS involvement. In these patients, reactivation is associated with a low CD4 count, and most of the patients have CNS involvement preceded by mucocutaneous lesions. The reactivation results in neuronal and glial infection, and immune-mediated lesions, including demyelization and vasculitis. Additionally, some of the cases have early neurological manifestations of meningoencephalitis prior to the appearance of maculovesicular exanthema, while others present with late complications including vasculitis with granulomatous angiitis [8]. Diagnosis of VZV meningoencephalitis is reached with a combination of neurological manifestations, the presence of VZV DNA in CSF, and lack of any other identifiable pathogen in CSF. In our case, though fever was absent, the first symptom was headache followed by painful vesicular lesions over the scalp and face. The CNS examination revealed neck rigidity. Additionally, MRI brain suggested findings of acute meningoencephalitis. Finally, the diagnosis of VZV was confirmed on DNA PCR of CSF.

During an acute episode, the goal of treatment is symptomatic relief and complication prevention. Usually, the recovery is incomplete, and the patients have some residual neurological manifestations. Early diagnosis and treatment lead to better outcome with no neurological deficit, as observed in our case. Nucleoside analogues, including acyclovir, famciclovir, and valacyclovir, act by inhibiting replication of VZV. They fasten the healing of eruptions and decrease the duration and severity of acute pain, the duration of viral shedding, and the risk of progression to postherpetic neuralgia. Addition of corticosteroids to antiviral therapy produces modest reduction in the duration and the severity of acute symptoms [7]. In our case, combination of corticosteroid and antiviral therapy led to dramatic improvement and clearing of lesions with preservation of eye sight. However, in view of RVD, antiretroviral therapy was initiated.

Conclusion

In patients with RVD, VZV reactivation leads to severe and life-threatening HZO and meningoencephalitis. Infectious disease physicians should rule out VZV by PCR of CSF, as early treatment may improve the outcome. The case also highlights the benefits of retroviral testing in patients with illness indicative of immunosuppression including HZ.

Abbreviations

CNS	Central nervous system
CSF	Cerebrospinal fluid
HZ	Herpes zoster
HZO	Herpes zoster ophthalmicus
MRI	Magnetic resonance imaging
PCR	Polymerase chain reaction
RVD	Retroviral disease
VZV	Varicella zoster virus

Acknowledgements

The authors would like to thank Dr. Vikas S. Sharma (MD), Principal Consultant, Maverick Medicorum® (India), for medical writing assistance in the preparation of this article.

Authors' contributions
AJ, VMS, and AA collected the data and prepared the manuscript. VMS and AA wrote the discussion and revised the manuscript critically. All the authors approved the final manuscript.

Funding
No funding sources.

Availability of data and materials
The data supporting our findings is not available due to privacy concerns of the patient.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
A written and informed consent was taken from the patient.

Competing interests
The authors declare that they have no competing interests.

Received: 12 September 2023 Accepted: 24 October 2023
Published online: 08 November 2023

References

1. Lidhoo P, Unemori P, Leslie KS, Maurer T (2009) Disseminated herpes zoster with increased CD4 counts in 3 HIV-infected patients. J Am Acad Dermatol 61(2):345–347
2. Kennedy PG, Mogensen TH (2020) Determinants of neurological syndromes caused by varicella zoster virus (VZV). J Neurovirol 26(4):482–495
3. Birlea M, Arendt G, Orhan E, Schmid DS, Bellini WJ, Schmidt C et al (2011) Subclinical reactivation of varicella zoster virus in all stages of HIV infection. J Neurol Sci 304(1–2):22–24
4. Verra P, Paparizos V, Nikolaidou I, Antoniou C, Katsambas A, Rigopoulos D (2016) Predictive and diagnostic value of VZV infections in HIV patients: clinical and laboratory cross-correlations between VZV and HIV infections. Glob Dermatol 3(5):351–355
5. Jansen K, Haastert B, Michalik C, Guignard A, Esser S, Dupke S et al (2013) Incidence and risk factors of herpes zoster among HIV-positive patients in the German competence network for HIV/AIDS (KompNet): a cohort study analysis. BMC Infect Dis 13:372
6. Patil A, Goldust M, Wollina U (2022) Herpes zoster: a review of clinical manifestations and management. Viruses 14:192
7. Sampathkumar P, Drage LA, Martin DP (2009) Herpes zoster (shingles) and postherpetic neuralgia. Mayo Clin Proc 84(3):274–280
8. Corti M, Villafañe MF, Vittar N, Banco MC, Priarone M, Mammana L et al (2015) Meningoencephalitis due to varicella zoster virus in AIDS patients. Report of eleven cases and review of the literature. Rev Inst Med Trop Sao Paulo 57(6):505–508

Publisher's Note