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Herpes Zoster Ophthalmicus: A Case Series Highlighting Clinical Variability, Ocular Complications and the Importance of Early Intervention

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Abstract:

Aim: Herpes Zoster Ophthalmicus (HZO) is a serious manifestation of varicella-zoster virus (VZV) reactivation affecting the ophthalmic division of the trigeminal nerve. This study aims to highlight the varied clinical presentations, complications, and importance of early antiviral intervention in preventing long-term ocular damage.

Cases: Case 1: A 45-year-old male with early-stage HZO, presenting with mild conjunctival congestion and punctate epithelial keratitis, managed with oral antivirals and supportive therapy. Case 2: A 67-year-old female with severe HZO, corneal epithelial defects, and a high risk of postherpetic neuralgia (PHN), requiring high-dose antivirals and close ophthalmic monitoring. Case 3: A 32-year-old female with mild periorbital swelling and no corneal involvement, treated with oral antivirals and symptomatic management. Case 4: A 58-year-old female with extensive necrotic lesions, corneal haziness, and vision-threatening complications, requiring hospitalization and intravenous Acyclovir.

Conclusion: HZO presents with varied severity, with older patients at higher risk for complications and chronic pain syndromes like PHN. Hutchinson's sign serves as a crucial predictor of ocular involvement, necessitating early antiviral therapy to prevent severe outcomes. Vaccination remains an essential preventive strategy in high-risk populations. Timely intervention, multidisciplinary management, and patient education play a vital role in reducing disease morbidity and improving outcomes.

Keywords:

Herpes Zoster Ophthalmicus, Hutchinson's Sign, Varicella-Zoster Virus, Antiviral Therapy, Postherpetic Neuralgia

Introduction

Herpes Zoster Ophthalmicus (HZO) is a reactivation of the varicella-zoster virus (VZV) that affects the ophthalmic division of the trigeminal nerve, leading to significant ocular morbidity and potential long-term complications. The varicella-zoster virus, which initially causes chickenpox (varicella) in childhood, establishes latency in the dorsal root ganglia and can reactivate later in life, particularly in immunocompromised or elderly individuals, manifesting as herpes zoster (shingles). When the ophthalmic branch of the trigeminal nerve is involved, the condition is referred to as HZO, which can lead to keratitis, uveitis, retinitis, and even vision-threatening complications such as glaucoma and permanent scarring of the cornea. HZO accounts for approximately 10–25% of all cases of herpes zoster, with the incidence rising with age and immunosuppression. Studies indicate

that approximately 50% of all herpes zoster cases occur in individuals over 60 years of age, and among these, a significant proportion involve the ophthalmic division of the trigeminal nerve, leading to HZO[1]. The risk factors associated with the reactivation of VZV include advanced age, immunosuppressive conditions such as HIV/AIDS, malignancies, diabetes mellitus, and the use of immunosuppressive therapies, including corticosteroids and chemotherapy. The increasing prevalence of immunosuppressive conditions and the aging global population have contributed to a rise in the incidence of HZO, making it a growing public health concern. Clinically, HZO presents with a unilateral vesicular rash along the distribution of the ophthalmic nerve (V1) on the forehead, upper eyelid, and nose. A hallmark clinical sign, Hutchinson's sign, refers to vesicular lesions at the tip, side, or root of the nose, indicating an increased likelihood of ocular involvement due to the nasociliary nerve's participation in the disease process[2]. This sign is an essential predictive marker for the severity of ocular complications. The progression of HZO may lead to complications such as dendritic keratitis, uveitis, scleritis, and optic neuritis, which can significantly impair vision if not managed promptly. The pathophysiology of HZO involves viral replication within the nerve ganglia, followed by inflammation, necrosis, and secondary immune-mediated damage to ocular structures. The resultant neurotrophic dysfunction can lead to corneal anaesthesia and persistent epithelial defects, contributing to chronic ocular surface disease and recurrent ulceration. Additionally, the inflammatory response may lead to elevated intraocular pressure (IOP), resulting in secondary glaucoma. In some cases, postherpetic neuralgia (PHN), characterized by chronic neuropathic pain, persists for months or even years, significantly affecting the quality of life of affected individuals[3].Diagnosis of HZO is primarily clinical, based on the characteristic dermatological and ocular findings. However, laboratory confirmation using polymerase chain reaction (PCR) for VZV DNA or direct fluorescent antibody testing can be employed in atypical cases. Imaging modalities such as optical coherence tomography (OCT) and anterior segment photography assist in assessing the extent of corneal and retinal involvement. Early diagnosis is crucial, as prompt initiation of antiviral therapy with acyclovir, valacyclovir, or famciclovir within 72 hours of symptom onset has been shown to reduce the severity of the disease and prevent complications. Adjunctive therapies such as corticosteroids, topical antibiotics, cycloplegics, and intraocular pressure-lowering agents are often necessary for comprehensive management. The advent of the zoster vaccine has been a major breakthrough in preventing herpes zoster and its complications, including HZO. The recombinant zoster vaccine (Shingrix) has demonstrated superior efficacy over the live-attenuated vaccine (Zostavax) in preventing herpes zoster and reducing the burden of postherpetic neuralgia, particularly in older adults[4]. Vaccination programs targeting individuals over 50 years of age and immunocompromised patients have been recommended as a key strategy to reduce the incidence and severity of HZO-related complications. Despite advances in antiviral therapies and vaccination, the burden of HZO remains significant due to its potential for chronic ocular disease and visual impairment. Long-term follow-up of affected individuals is necessary to monitor for sequelae such as neurotrophic keratitis, secondary glaucoma, and chronic pain syndromes. Research continues to explore novel treatment approaches, including immunomodulatory therapies and nerve-targeted pain management strategies, to enhance patient outcomes and quality of life. Herpes Zoster Ophthalmicus is a potentially sight-threatening condition requiring prompt recognition and early intervention. It predominantly affects older adults and immunocompromised individuals, with a range of ocular complications that can lead to permanent visual impairment. The introduction of vaccination strategies has provided a crucial tool in reducing the disease burden. However, continued research into effective management strategies is essential to minimize complications and improve long-term outcomes for affected patients.

Cases

Case 1: Middle-aged Male with Herpes Zoster Ophthalmicus and Early Ocular Involvement

A 45-year-old male presented with a painful vesicular rash, erythema, and swelling localized to the right side of the face, extending from the forehead to the periorbital region and upper cheek. He also had Hutchinson's sign, with vesicular lesions on the tip of the nose, indicating nasociliary nerve involvement. The patient reported eye discomfort, photophobia, and mild blurring of vision. Ocular examination revealed mild

conjunctival congestion and early punctate epithelial keratitis, but no signs of anterior uveitis or corneal ulceration. Given the early stage of the disease, prompt antiviral therapy (Valacyclovir/Acyclovir) was initiated, along with supportive ophthalmic treatment. This case highlights the importance of early intervention in preventing severe ocular complications.

Figure 1.

Case 2: Elderly Female with Severe Herpes Zoster Ophthalmicus and Corneal Involvement

A 67-year-old female presented with multiple vesicular lesions and ulcerative crusting over the forehead, extending to the periorbital region and nasal bridge. She exhibited significant periorbital edema, conjunctival injection, and corneal epithelial defects, indicating herpetic keratitis. Hutchinson's sign was present, suggesting high-risk ocular involvement. The patient reported intense facial pain, photophobia, and severe eye discomfort. Given her age and systemic frailty, she was at a higher risk of postherpetic neuralgia (PHN) and chronic complications. She was started on high-dose antivirals (oral Valacyclovir 1000 mg TID) and lubricating eye drops, with close monitoring for uveitis, secondary glaucoma, or neurotrophic keratitis. This case emphasizes the increased disease severity in older adults and the need for aggressive management.

Figure 2.

Case 3: Young Female with Mild Herpes Zoster Ophthalmicus and Eyelid Involvement

A 32-year-old female presented with erythematous vesicular lesions over the right forehead, extending down the nasal bridge, associated with periorbital swelling and pain. The patient had a swollen upper eyelid but no corneal involvement at the time of examination. She complained of burning pain and a tingling sensation before the rash appeared, a characteristic prodrome of herpes zoster. Her visual acuity was intact, and slit-lamp examination showed no signs of keratitis or anterior segment inflammation. Given the early stage of the disease, she was managed with oral antivirals, lubricating eye drops, and pain management with NSAIDs. This case highlights that younger patients may have milder presentations but still require vigilant monitoring for late ocular complications.

Figure 3.

Case 4: Severe Herpes Zoster Ophthalmicus with Vision-threatening Complications

A 58-year-old female presented with extensive vesicular eruptions, ulcerated and necrotic lesions, and marked facial edema involving the forehead, eyelid, and nasal region. The patient had completed right upper eyelid swelling with crusted lesions, conjunctival injection, and corneal haziness, suggesting significant ocular involvement. She reported severe pain, photophobia, and reduced vision in the affected eye. Examination revealed advanced keratitis, possible neurotrophic changes, and early signs of secondary bacterial infection. Given the severity and potential vision loss, she was admitted for intravenous Acyclovir, aggressive pain management, and close ophthalmic monitoring. This case highlights the importance of early hospitalization for severe cases with ocular complications to prevent permanent visual impairment.

Figure 4.

Discussion

Herpes Zoster Ophthalmicus (HZO) is a severe manifestation of varicella-zoster virus (VZV) reactivation involving the ophthalmic division of the trigeminal nerve. The cases presented in this series illustrate the diverse clinical presentations of HZO, ranging from mild early-stage keratitis to severe corneal involvement and vision-threatening complications. Several key factors influence disease progression and outcomes, including age, immune status, and prompt initiation of antiviral therapy. Age plays a significant role in the severity of HZO. In Case 1 (45-year-old male) and Case 3 (32-year-old female), the disease presented with milder symptoms, including early keratitis or periorbital swelling without severe ocular involvement. In contrast, Case 2 (67-year-old female) and Case 4 (58-year-old female) demonstrated more severe complications, such as corneal epithelial defects, neurotrophic changes, and potential vision loss. This aligns with existing literature, which shows that elderly patients are at a higher risk of severe HZO, ocular complications, and postherpetic neuralgia (PHN) due to age-related immune decline.[1,2].A key clinical feature in all cases was Hutchinson's sign, which is characterized by vesicular lesions on the tip, side, or root of the nose. This sign is highly predictive of ocular involvement due to the nasociliary branch of the ophthalmic nerve (V1) innervating both the cornea and nasal skin[3]. In this case series, patients with Hutchinson's sign exhibited higher rates of corneal involvement, keratitis, and conjunctival injection. Studies suggest that patients with Hutchinson's sign have a 76% increased risk of developing ocular complications[4]. Early recognition of this sign is crucial for prompt referral and aggressive ophthalmic management. All four cases received systemic antiviral therapy (Valacyclovir/Acyclovir) within the recommended therapeutic window. Early antiviral treatment has been shown to reduce viral replication, shorten disease duration, and lower the risk of postherpetic neuralgia and ocular complications[5]. In Case 4 (severe HZO with vision-threatening complications), intravenous Acyclovir was administered due to extensive lesions, significant corneal damage, and suspected bacterial superinfection, underscoring the need for hospitalization in severe cases. The most common ocular complications in this series included conjunctivitis, keratitis, and corneal epithelial defects. These findings are consistent with literature indicating that 50% of HZO cases develop some form of ocular involvement, with complications such as scleritis, uveitis, secondary glaucoma, and neurotrophic keratitis occurring in severe cases[6,7]. In Case 2 (elderly female with corneal defects) and Case 4 (severe ocular complications), the risk of neurotrophic keratitis and secondary bacterial infection necessitated aggressive supportive therapy, including lubricants, antibiotics, and close ophthalmic monitoring. Postherpetic neuralgia (PHN) is a debilitating complication of HZO,

particularly in older adults. In this series, Case 2 (elderly female) was at the highest risk due to her age and systemic frailty. Studies indicate that PHN affects up to 30% of patients with HZO, with higher rates in those over 60 years of age[8,9]. Management strategies include neuropathic pain medications (Gabapentin, Pregabalin) and early antiviral therapy to reduce the risk of chronic pain syndromes. Vaccination remains the most effective strategy for preventing herpes zoster and its complications. The recombinant zoster vaccine (Shingrix) has shown >90% efficacy in preventing herpes zoster and reducing the severity of disease and PHN in high-risk populations, particularly those over 50 years of age[10]. None of the patients in this case series had received prior vaccination, highlighting the need for improved vaccination awareness and uptake. The CDC recommends routine zoster vaccination for individuals over 50 years and immunocompromised patients to reduce HZO incidence and complications.

Conclusion

This case series highlights the diverse clinical spectrum of Herpes Zoster Ophthalmicus (HZO), ranging from mild keratitis to severe, vision-threatening complications. Early recognition, prompt antiviral therapy, and close ophthalmic monitoring are crucial in preventing long-term ocular damage. Hutchinson's sign serves as a strong predictor of ocular involvement, warranting aggressive intervention. Elderly patients are at higher risk of severe complications and postherpetic neuralgia, emphasizing the need for vaccination as a preventive strategy. Multidisciplinary management remains key in reducing morbidity and improving patient outcomes.

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