



Herpes Zoster Ophthalmicus Reactivation after mRNA 1273 Vaccination

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Abstract

Background: Clinically two different types of Varicella-Zoster Virus (VZV) infection are found commonly. Varicella (chickenpox) is caused by primary infection, and Herpes zoster, also known as shingles, is caused by reactivation of latent VZV that gained access to sensory ganglia during varicella. Reactivation is influenced by age-related immune-senescence, iatrogenic immunosuppression or disease-related immune-compromise state. As a vaccine can cause Immune Reconstitution Inflammatory Syndrome (IRIS), it can also reactivate VZS.

Case Report: We discovered an elderly male (62 years old, Bangladeshi) with a painful blister around his right eyeball, as well as blurred vision in that eye. Examination found decreased visual acuity with hyperemia and edema in the eyelid and conjunctiva. He was found to have Herpes Zoster Ophthalmicus (HZO). Herpes zoster is a reactivation of the varicella-zoster virus, most commonly seen in the elderly and immunosuppressed, with incidence estimates ranging from 1.25 to 5.25 per 1,000 person-years showed in different studies. If patients are not treated promptly and aggressively, HZO with intraocular involvement can significantly impair visual vision. Our patient recovered entirely after getting proper treatment.

Conclusion: No vaccine is 100% safe, and intense surveillance to assess the vaccine safety for the detection of any event which could attenuate the expected benefits, and thus to take any necessary action to minimize risks to vaccinated individuals.

Keywords: Reactivation; Herpes Zoster Ophthalmicus; Immunocompromised; Vaccine

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Introduction

COVID-19 causes 219 million infections and 4.55 million deaths up to 01-10-2021 in Bangladesh. Most commonly, infected persons present with respiratory tract-related problems, but very few also presented with atypical presentations like maculopapular eruptions, morbilliform rashes, urticaria, chickenpox-like lesions, and livedo reticularis. Usually, disease-related fatalities are found mostly where the respiratory tract has been involved. New variants of the COVID-19 have emerged, vaccines are needed to protect individuals at high risk and to potentially control disease outbreaks through the establishment of herd immunity [1,2]. The theory of herd immunity in COVID-19 is controversial, though. But applying the vaccine has impacted the curve of the pandemic. COVID-19 vaccine doses have been administered to a total of 48.2 million people, with 16.7 million completing both amounts (about 10.2 per cent of the total population). Although no vaccine is 100 percent safe, adverse events following immunization are reported to be less than 1% in Bangladesh, according to the country's health ministry. Tenderness at the injection site, weariness, soreness at the injection site, and malaise are all common side effects of the mRNA 1273 vaccination. Rare side effects are thrombocytopenia with thrombosis syndrome, myocarditis and pericarditis. Anaphylaxis after the vaccine, which usually occurs within minutes to 5 h, has not been still reported in the country. Varicella-Zoster Virus (VZV) is a human neurotropic virus that causes varicella. This is followed by the establishment of latency in sensory ganglia, notably the dorsal root ganglia, trigeminal ganglia, and enteric ganglia. The latent phase usually lasts for several decades before reactivation occurs. VZV reactivation can present as HZO, which is characterized by pain, paresthesia, tenderness, rash in the forehead, swelling of the eyelid, and blurry vision [3-6]. VZV reactivation in COVID-19 cases has been already reported. COVID-19-associated lymphopenia, especially CD3+ CD8+ lymphocyte and functional impairment of CD4+ T cells, can render a patient more susceptible to developing HZ by reactivating VZV. It is also reported that HZ could be a sign of undiagnosed COVID-19

infection in younger age groups [7-10]. Here, writes a case with HZO reactivations after mRNA 1273 vaccination.

Case Presentation

A 62 years old male Bangladeshi citizen was taken mRNA 1273 vaccine from Sheikh Hasina National Institute of Burn & Plastic Surgery Institute on 11/08/2021. He developed a high grade of fever that subsided after 48 h by itself. Seven days later, he found small lesions around his right eyeball. From eight-day, an itching and tingling sensation appeared on the right side of his forehead, which was followed by tenderness in the area of the lesions. He complained of blurred vision with extreme sensitivity to light in his right eye and developed a watery discharge. Gradually the lesions became more significant and reddish.

Diagnosis

Clinical findings correlate with herpes zoster ophthalmicus. Slit-lamp examination found

- Eyelid: hyperemia, edema.
- Conjunctiva: hyperemia, petechial hemorrhages, vesicles.
- Sclera\episclera: limbal vasculitis
- Cornea: Epithelium: Pseudo-dendrites
- Stroma: Nummular stromal keratitis.
- Iris\uvea: Segmental iris edema.

Visual acuity: 6/12 in the right and 6/6 in the left.

Previously he had no history of visual disturbance. He got oral acyclovir 800 mg PO five times daily for 7 to 10 days for skin rash and prednisolone acetate 1% for ocular therapy. According to his statement, he had a history of chickenpox in his early childhood and no treatment was required for that. He had no history of insect bites or irritant contact in that area. Lesions are not found in other body areas like the trunk or extremities. No biopsy was done. Follow-up was done after two weeks, and he was found to have recovered well (Figure 1).

Discussion

Possible causes of this type of lesion are Herpes zoster ophthalmicus, irritant contact dermatitis, insect bite, and bullous lesions. In irritant contact dermatitis, there must be a history of contact with chemicals or like that. The patterns of lesions are usually vesicular, and irritation is present in that area. Whereas bullous presents itchy, tense blisters over normal skin or erythematous and edematous background on the trunk and extremities. Our presented case shows the dermatomal distribution, confined in the right of the forehead with the eyeball area. No extension to the opposite location. Also, he had a history of varicella (chickenpox) in his childhood. Increasing age is one of the significant augmenting factors for reactivation of HZO, partly because of age-related decline in specific cell-mediated immune responses to HZO. On the other hand, other risk factors include disease-related immune compromises such as HIV infection, iatrogenic immune-compromised, physical trauma, or comorbid conditions such as malignancy or chronic kidney or liver disease [11-13]. The most common complication of HZ is postherpetic neuralgia, while other complications include ocular ones (HZ ophthalmicus, acute retinal necrosis, neurological ones (Ramsay Hunt syndrome, Bell's palsy, aseptic meningitis, encephalitis, peripheral motor



Figure 1: Picture of the patient.

neuropathy, myelitis, Guillain-Barre syndrome, stroke syndromes), and bacterial infection of the skin [14]. Cell-mediated immunity is critical for the maintenance of latency and for limiting the potential for reactivation, while recurrences are more common among patients with immunosuppression [15-21]. Post-vaccination HZ is rarely reported in the literature. Walter et al. [22]. Reported three different cases of herpes virus reactivation following inactivated influenza, hepatitis A, and rabies and Japanese encephalitis vaccines, while Bayas et al. [16] reported a case of branchial plexus zoster after yellow fever vaccination. Regarding COVID-19 vaccination, we could only retrieve a publication by Bostan et al. [17], who reported a case of VZV reactivation in 79-year-old patient five days following vaccination and a more recent one with six immune-compromised patients with autoimmune inflammatory diseases who developed the first episode of HZ closely after vaccination with the BNT162b2 mRNA vaccine [18]. Reactivation of VZV is a failure of the T cell compartment to maintain control of the infection. This is supposed to occur more frequently with increasing age due to adaptive immunosenescence [19]. On the other hand, a vaccine strongly stimulates the immune system and polarizes it to a vaccine-induced T cell response. The SARS-CoV-2 mRNA-1273 vaccine elicited a robust CD4 cytokine response involving type 1 helper T cells among participants older than 55 years old [20]. Vaccine-induced reactivation of HZ may be similar to Immune Reconstitution Inflammatory Syndrome (IRIS), which is a paradoxical worsening of preexisting infection masked by the host's regained capacity to mount an inflammatory response following the initiation of the host ART [21-23]. HZO is a not very uncommon, but vaccine-related HZO is a rare condition.

Conclusion

Mass vaccination activities are going on throughout the world. Like many countries, Bangladesh still depends on another country for the vaccine. No vaccine is 100% safe, and strong surveillance to assess the vaccine safety for the detection of any event which could attenuate the expected benefits, and thus to take any necessary action to minimize risks to vaccinated individuals. Bangladesh government has targeted to vaccinate 80% population of the country, which needs more than 15 core vaccines. So, there may be a chance of vaccine-related severe adverse events. HZO may be a rare AEFI and fortunately treatable disease. Moreover, mRNA the platform is a promising new technology, and demonstrating its safety is meaningful for developing further vaccines against viruses and tumors.

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